FOREWORD

In Rwanda, a large number of communicable diseases, emerging, reemerging infectious diseases and health related events and conditions continue to remain major public health problem that affect Rwanda and other countries in the region. To cope with the health threats, the Ministry of health elaborated an outbreak preparedness and response plan; district hospital rapid response team was established and trained in diseases surveillance and response. IDSR focal persons were nominated at all district hospitals, an electronic reporting system in now under implementation to facilitate, timeliness and completeness of data reporting.

The country has often faced epidemics including emerging and re-emerging infectious diseases such as Influenza A (H1N1), cholera, epidemic typhus and meningitis. Lack of an adequate functional integrated disease surveillance and response system has always complicated activities related to preparedness and response to epidemic outbreaks.

In this context, the Ministry of Health is driven to set up an integrated disease surveillance and response system based on data collection, reporting, analysis, interpretation, and dissemination on which evidence based decisions of public health concern can be made.

This technical guideline for integrated disease surveillance and response was elaborated based on the WHO AFRO integrated disease surveillance and response 2010 version and provides a platform for all activities in disease surveillance and response at all levels of the health system in Rwanda.

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Dr Agnes BINAGWAHO
Minister of Health

ABBREVIATIONS

AFP	: Acute Flacid Paralysis
AIDS	: Acquired Immunodeficiency Syndrome
ARI	: Acute Respiratory Infections
ATV	: Anti Tetanus Vaccine
BK+ /BK	: Koch's Bacillus (positive / negative)
CCHF	: Congo Crimean Hemorrhagic Fever
CDC	:US Centres for Disease Control and Prevention
CHUK	:Kigali University Teaching Hospital
CSF	: Cerebrospinal Fluid
DEC	: Diethyl Carbamazine
DH	: District Hospital
DIV	: Division
DOTS	: Directly Observed Treatment Short Course
DS	: Health District
EPI	: Expanded program of Immunization
ELISA	: Enzyme Linked ImnunoAssay
HC	**:** Health Center
HF	: Health Facility
HIB	: Haemophilus Influenzae type b
HIV	:Human Immunodeficiency Virus
HTH	: Calcium Hypochlorite
IDS	: Integrated Disease Surveillance
IDSR	: Integrated Disease Surveillance and Response
IGM	: Immunoglobulin M
IMCI	: Integrated Management of Childhood Illness
IHR	: International Health Regulation
IRC	: International Rescue Committee
IUATLD	: The International Union Against Tuberculosis and Lung Disease.
IV	: Intravenous
JLV	: Local Vaccination Days
JNV	:Journee National de Vaccination (National Vaccination Day)

MOH	**:** Ministry of Health
MSF	: Doctors without Borders
NRL DIVISION	**:** National Referral laboratory
ONG	: Organization Non Gouvernementale (Non Governmental Organization)
OPV	: Oral Polio Vaccine
ORS	:Oral Rehydration Salt
PCR	: Polynucleotide Chain Reaction.
PMTCT	: Prevention of Mother to Child Transmission (of HIV)
PNILT	: Integrated National Program of Fight against Leprosy and Tuberculosis
PNLP	: Integrated National Malaria Control Program
PSI	: Population Services International
RSV	: Human respiratory syncytial virus
SD1	: Shigella Dysenteriae type 1.
SIS	: Health Information Management System
STI	: Sexually Transmitted Infections
TB	: Tuberculosis
TNN	: Neonatal Tetanus
RBC/IHDPC	: Rwanda Biomedical Centre / Institute of HIV/AIDS, Disease Prevention & Control
RSI	: Regulation Sanitaire International
TB	:Tuberculosis
UNAIDS	: Joint United Nations Program on HIV/AIDS
UNICEF	: United Nations Children's Fund
UNR	: National University of Rwanda
VCT	: Voluntary Counselling and Testing
VHF	: Viral hemorrhagic fevers
WHO	: World Health Organization
WHO/AFRO	: World Health Organization, Regional Office for Africa .
ZN	: Ziehl-Neelsen

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INTRODUCTION

For early detection and efficient, timely intervention against communicable diseases, control being a priority in the World Health Organization (WHO) African region, in September 1998, in Harare, member states adopted resolution AFRI/RC48/R2 of 48th OMS-AFRO regional committee related regional strategy for integrated disease surveillance (SIM).

Communicable diseases are the major causes of most frequent deaths and disability on the African continent. In Rwanda, they are a major menace to the community even though interventions to fight or prevent them are well known. In this regard surveillance data enable health personnel to implement appropriate strategies to fight or even prevent such diseases.

To understand the problem and take appropriate measures, it is indispensable to have an operational disease surveillance system. Application of epidemiological methods in surveillance activities enables health teams and communities to determine priorities, plan interventions, anticipate and detect in time epidemic outbreaks, mobilize and distribute available resources.

In this context, it is imperative to put in place a coherent program for an integrated disease surveillance and response system to carry out an epidemiological surveillance which would help to:

- Timely detect epidemic outbreaks;
- Identify zones which are more at risk;
- Collect data on which realistic decisions can be made;
- Obtain precise and accurate information based on evidence obtained in the laboratory;
- Monitor and evaluate programs responsible for control and management of infectious diseases.

However, surveillance data related to communicable diseases is not always communicated and analyzed. This results in loss of opportunity to take appropriate preventive measures on public health and save lives. Even when pertinent information is collected, it is never fully utilized or exploited at local level to enable them take relevant decisions often leading to taking very late measures to fight diseases.

WHAT IS INTEGRATED DISEASES SURVEILLANCE?

Epidemiological surveillance is defined as the systematic, on-going collection, analysis, interpretation, and dissemination of health information. It requires a careful and vigilant approach to information gathering and analysis which helps to maintain and improve the health of the population. It is essential to plan, implement and evaluate health practices.

On the basis of its experience in this field, the WHO regional office for Africa (WHO-AFRO) has proposed a strategy aimed at improving the surveillance and response to communicable diseases through an integrated surveillance program which establishes a link between different levels of the health system of each country, community, health centre, District, Province, or region and the Ministry of Health according to the structure of the health system in each given country.

The integrated disease surveillance (IDS) strategy provides for rational utilization of resources devoted to the prevention and fight against diseases. At the time of the preparation of this strategy, a number of intervention programs had their own surveillance systems. As years went by each program strived to build its own capacity to obtain the necessary data for the development of up-to-date, reliable and useful information for health activities. These efforts called for synergy especially at the District and health centre levels. They often relied on the same structures, process and personnel which resulted in irrational use of available resources and overstretching of efforts.
In an integrated system:

- The District level is the point of convergence of integration of surveillance activities since it constitutes the first level in the health system and has full time staff in charge of all aspects of public health especially surveillance of health activities in the community; mobilization of community efforts; commitment to national assistance and access to local resources to protect the health of District inhabitants.

- All surveillance activities are coordinated and directed to a specific point. Instead of utilizing the meagre resources to maintain a multitude of vertically separated activities, available means are combined at each level in order to gather information from one unique focal point.

- Several activities are combined into a single one on the basis of their similarity in required surveillance aptitudes, necessary resources for their execution and target population in the surveillance domain. For example surveillance activities for acute paralysis (AFP) may respond to surveillance needs linked to neo-natal tetanus, measles and other diseases. Similarly, health personnel who systematically monitor AFP cases may equally examine registers held by districts and health centres to obtain information on other priority diseases.

- The in-charge of surveillance at district and national level collaborates at each level with committees charged with the fight against epidemics in order to plan adequate disease control activities in public health and actively carry out research on which resources can be conveniently combined.

AIM AND OBJECTIVES OF INTEGRATED DISEASE SURVEILLANCE

IDS AIM:

Improve National, Districts, and Health facilities aptitude to detect and respond to diseases and affections which contribute to the high rate of mortality, morbidity and disability in their operational zone.

By strengthening capacity and resources in relation to integrated surveillance, it is possible to improve the health and well being of communities living in the District and the country at large.

GENERAL OBJECTIVE:

Provide reliable and timely information before taking decisions and choice of public health intervention to efficiently fight communicable diseases. To implement this, the Ministry of Health, in conformity with WHO advice, has proposed simple surveillance and response tools. These tools shall contribute timely to epidemiological information and provide advice as to what action to be taken without delay and resources to be used which can contribute more to efficiency of interventions against diseases.

SPECIFIC OBJECTIVES:

- Build capacity to efficiently carry on surveillance activities;

- Integrate different existing surveillance systems for rational and coherent utilization of available resources;
- Improve the use of surveillance information by decision makers and intervening parties at all levels of the health system;
- Facilitate the circulation of surveillance information between different level of the health system and the interior of each of these levels;
- Strengthen the capacity and role of laboratories in the identification of pathogens and surveillance of their sensibility to drugs;
- Promote the participation of clinicians in the surveillance system;
- Involve more laboratory staff in the surveillance system and activities;
- Promote the participation of the community in detection and prevention of public health problems.

HOW DOES INFORMATION CIRCULATE IN THE INTEGRATED DISEASE SURVEILLANCE SYSTEM?

A sick person goes to hospital to seek medical care. Information concerning the patient is recorded in a register which is updated on a daily basis. This register contains information related to patients, out patients and those admitted. They particularly contain the following essential data:

Identification number of the patient; date on which the patient fell sick, date of admission into hospital; date of discharge in the case he/she was hospitalized; address (residence), age, sex, diagnosis, treatment, and progress of the patient.

If the clinician suspects the patient has recovered or if the disease presents an important epidemic risk, the case is immediately brought to the attention of person in charge of health information at the health centre, and later the district hospital and central level. The health centre must henceforth take preventive measures to check the suspected epidemic. The district hospital, must simultaneously take appropriate steps to carry out an investigation on the case and confirm the causative agent then communicate the results from the investigation to the central level immediately.

The central level then decides if the information provided is sufficient enough to take decision on the epidemiological situation or if it is necessary to carry out another investigation first. Results from these investigations shall then be used to plan appropriate responses in collaboration with the District or health centre. One of the measures which can be taken if an epidemic disease is suspected is to carry out laboratory tests and confirm the causative agent. As soon as samples are obtained, the following information must be registered: type of sample; date obtained, date sent to the laboratory, state (bad or good) of the sample from time of reception by the laboratory, results of analysis.

Periodically, once a week, monthly or quarterly depending on the disease under surveillance, the health facility summarizes the data related to the case for each priority disease. The results are systematically communicated to the District hospital. The health centre also proceeds to analyze the data, by particularly registering trends for certain priority diseases or by verifying if certain thresholds were not crossed such that the medical personnel would eventually adopt certain measures.At the District hospital, the data is compiled once a week

for epidemic prone diseases. A monthly report comprising all diseases and other administrative information is written out by each health facility and sent by electronic mail to the health information system. The District also prepares an analysis related to the chronology, place and other individual characteristics (age, and especially sex) for admitted or out-patients. This data is transmitted to the central level, and a copy for information and appropriate action is sent to the head of health department and head of social affairs at the district level (office of the Mayor).

On the basis of this information, the District and the central level prepare graphic trends and epidemic curves related to the routine surveillance of diseases targeted by SIMR program. Each District and the central level keep a register of epidemics communicated by health facilities. This list indicates the nature of the potential epidemic, the number of suspected cases, dates of investigations and interventions carried out by the District. It equally contains conclusions of investigations carried out at District and central level.

HOW CAN IDS CONTRIBUTE AND IMPROVE PREPAREDNESS FOR EPIDEMICS?

When an outbreak of a communicable disease appears or is detected, there is often not enough time to organize initial training or mobilize necessary resources.

In Rwanda even though the IDSR Technical Guide has been available since 2002, certain gaps still remain and constitute obstacles for putting in place an effective IDS strategy, including poor data analysis and feedback at all levels among others; incomplete communication of reports of new cases, drug stock-outs, lack of medical and laboratory materials, failure of health communication procedures, etc.

The best preparation for emergent situations can save lives. In fact in places where preparation plans for epidemics were in place, early detection of out breaks facilitated prompt and adequate interventions.

Epidemiological surveillance involves collection of data for the description and analysis of health events. It provides information and necessary capacity for early detection of epidemics; strengthens preparations for emergency situations. For example, a committee to fight epidemics can define, in advance, the role of each level of responsibility in the prevention domain. Often limited resources are managed by combining available resources and means for training and using sparingly adequate supplies (materials, vaccines, drugs, various supplies).

HOW ARE SURVEILLANCE FUNCTIONS DESCRIBED IN THE TECHNICAL GUIDE?

In this manual we suppose that all echelons of the health system shall participate in the implementation of surveillance activities aimed at detecting and fighting priority diseases and elements by application of the following procedures:

Step 1- Identification of cases: This means identification of priority diseases on the basis of standard case definitions.

Step 2- Notification: This involves informing superior level of a suspected case. If the case is suspected to be a potential epidemic which must be eradicated/eliminated investigations and response activities must be started immediately.

Step 3 – Analysis and data interpretation: Data is grouped and analyzed to derive tendencies. Information is then compared with previous history and results are summarized.

Step 4 - Investigation and confirmation of the case and possible epidemic outbreak: This step involves ensuring if the case is a confirmed epidemic outbreak by the laboratory if possible. Possible signs and causes of an epidemic outbreak are compiled and these indications are used to choose appropriate strategies to control the outbreak.

Step 5- Prevention: Mobilization of resources and personnel to implement adequate measures for preventing the epidemic.

S**tep 6 – Information Flow:** Cooperation and coordination with all levels involved in the outbreak management is encouraged. This is done by sharing results of outbreak investigations and the impact of interventions.

Step 7 – Evaluation and improvement of the system: Evaluation of the surveillance and response system in terms of early response, quality of information, preparedness, detection of thresholds, case management and performance in general from which measures are taken to improve the performance of the surveillance system.

INSTITUTIONS, ENTITIES INTERVENING IN IDSR, THEIR ROLES AND RESPONSIBILITIES

Each level of the surveillance system has a role to play in each of the surveillance functions[1]. The levels are defined as follows:

Community : Represented by local community services, trained traditional midwives, the opinion leaders « Inyangamugayo », the binomials and important village personalities, school teachers, students, community health workers and other elites.

Health Centres: This covers all institutions which give out- patient consultation services and/or hospital care.

District hospital: This refers to a hospital having administrative responsibility in its operational zone: supervision and training of health centres and dispensaries. Serving a population of 100,000 - 300,000 persons

RBC/IHDPC/EID Division: This is the central department in charge of coordinating the surveillance and response system.

RBC/NRL Division: National Reference laboratory of Rwanda which coordinates all activities related to biomedical laboratories in Rwanda.

N.B: In Rwanda laboratory services exist at HF level. They are guided by a national quality Assurance system and linked to the reference laboratory for specific diseases.

HOW CAN DIFFERENT LEVELS OF THE HEALTH SYSTEM MAKE USE OF IDSR TOOLS?

To describe their role in the epidemiological surveillance system, districts will use a matrix of surveillance functions and aptitudes.

Here below is a matrix with a complete system including all competence and necessary activities. Each level supports activities carried out at other levels and strengthens the capacity to take hierarchical decisions. In a developing system, the matrix provides a systematic structure which enables improvement and strengthening of the system.
Among other practical uses of the matrix include:

[1] *The principal objective of this guide is to improve surveillance in public health centers (approved or Government). In Districts or regions where notification by public health institutions is of good quality, it is advisable to integrate it into the system of private and non-governmental organizations*

- Ensuring that all necessary functions and capacities have been identified;
- Establishing a hierarchy of responsibilities;
- Managing and monitoring programs;
- Planning needs in all necessary resources ;
- Improving human resource capacities through training programs

Furthermore, this matrix expresses several basic hypotheses regarding surveillance systems:

- If at each level at least one of the elements is absent or implemented in an unsatisfactory manner, the risk of failure increases in relation to realization of surveillance and response objectives;
- An efficient system shall be supported at each level by higher and lower level;
- A complete system minimizes all eventual delays in the application of public health measures;
- Functions of detection, analysis, investigation, response, information exchange and evaluation are interdependent and should always be linked.

The matrix presented on the following pages defines surveillance functions and the manner in which they are implemented at each level of the health system.

TABLE 1: IDSR CORE FUNCTIONS AND ACTIVITIES BY HEALTH SYSTEM LEVEL

Level	**1.0 Identify cases:** Remark-procedures related to biological analysis apply to all levels having access to laboratory services	**2.0 Notify :**	**3.0 Analyse and interpret :**
Community	• Use of simplified case definitions to identify priority diseases in the community.	Identify which health events must be communicated to the health facility and at what time	• Involve local people in the sharing and interpretation of the plan and pathological trends in the community
Health Centre	• Use standardized cases definitions to identify priority diseases in: - Outpatient consultations or admitted cases; - Reports submitted by the community; - Reports from the private sector.	• Communicate information on a case by case basis for diseases which must be notified immediately; • Communicate on a weekly basis, data compiled from internal and external consultation services, the community and the private	• Prepare and regularly update graphics, tables, and charts to describe notified diseases in relation to person, place, time; • Identify and immediately communicate all diseases which: - go beyond intervention threshold, - appear in places where they, till then, were absent,

	• Register information concerning suspect cases in the medical registers and patient file; • Use the local laboratories capacities to diagnose suspected cases; • Use standard protocols to test laboratory samples • Collect and transport clinical samples to laboratory for tests.	sector; • Transmit summarized data to District Hospital; • Communicate to District hospital laboratory results from screened population in target sites (for example: STI clinic, IDS service, blood bank)	- appear more frequently than in the past in a certain group of population; - Show unusual trends or characteristics. • Interpret results, discuss possible public health actions with the district team; • Observe changes in trends in the cause of the systematic analysis of laboratory results; • Involve local people in the sharing and interpretation of pathological trends and plans in the community.
District Hospital	• Carry out activities aiming to systematically collect epidemiological surveillance data on time • Examine registers of epidemics • Collect and transport clinic	• Assist health facilities to be familiar with standardized definitions of cases and use for reporting epidemic prone diseases • Ensure that personnel of health structures know	• Define denominators and obtain data to ensure accuracy of the denominators • Approve data from reports submitted by health centres • Analyse data per case according to the individual, place and chronological

	samples for evaluation at the laboratory evaluation • Use the nearest laboratory with the possibility to refer to the higher laboratory • Implementation of activities that are to timely collect systematic surveillance data • Make available epidemic registers; • Provide logistics.	when and how to report epidemic prone diseases • Trainings within districts on standardized definitions of cases and use them for notification of epidemic prone diseases; • Make sure that district hospitals report on diseases on a regular basis ; • Rapidly report diseases that can be immediately notified at the national level(MOH) • Communicate results of laboratory examinations to national and local leaders.	factors • Calculate rates and thresholds • Compare current data with previous data • Prepare and regularly update graphics, tables and forms to describe epidemic prone diseases reported according to chronology, place and individual characteristics. • Formulate conclusions on trends, thresholds and results of the analysis • Describe risk factors for epidemic prone diseases • Compile data from reports of districts; • Compare current data with previous data; • Ensure that every district uses appropriate denominators in analysis; • Interpret trends in a provincial

		• Communicate results of laboratory examinations to politico-administrative authorities ; • Sensitize politico-administrative authorities of epidemic problems	perspectives; • Provide resources regarding training in the area of training for analysis and interpretation of data; • Formulate of conclusions on the on the basis of analysis results
RBC/IHDPC/EID and NRL Divisions	• Establish monitoring procedure for the surveillance of target population • Carry out special investigations to collect information on unusual health events. • Determine and re-evaluate needs related to surveillance and put in place training programs and other support	• Prepare policies and procedures for the notification of priority diseases at each levels; • Integrate private sector laboratories in the notification network; • Notify the epidemic to the national and regional WHO office; to politico-administrative authorities sensitize the politico-	• Prepare policies and procedures for data analysis and interpretation; • Compile data from hospital reports; • Ensure that each level utilizes appropriate denominators for the analysis; • Interpret the trends in a national perspective; • Adopt and define the intervention and the threshold. • Provide training resources for data analysis and interpretation

	activities for each level • Mobilize adequate resources to support identification and notification of the case; • Prepare policies and procedures in collaboration with the national reference laboratory; • Oversee maintenance of quality and norms by the National Reference laboratory and the Central University Teaching Hospital laboratories with regards to diagnosis of epidemic prone diseases.	administrative authorities on epidemic problems Identify which health events must be communicated to the health centre and at what time	• Analyze the data in relation to chronology, place and individual characteristics, • Analyze the chart stratified by the District according to other risk factors; • Formulate conclusions on the basis of results analysis; • Establish reports, compile data in collaboration with national authorities and WHO if necessary; • Define required competences for data analysis in relation to public health for each level of personnel within the health system; • Ensure each level of each District utilizes appropriate denominators for analysis; • Interpret trends in a provincial perspective;

			• Formulate conclusions on the basis of result analysis
WHO representative; WHO regional office	• Support national and regional levels in the preparation of policies to detect priority diseases; • Mobilize resources for training logistics and supervision; • Prepare and disseminate standardized directives aimed at establishing "the best practices" in surveillance; • Inform the country about public health problems of international concern that are likely to have an impact on a regional scale;	• Receive epidemic notifications and diseases which require immediate notification;	• Establish and disseminate standardized directives for data analysis in what concerns each priority disease; • Provide logistical and technical support in the analysis and interpretation of results

Table 2: Detecting and responding to priority diseases

4.0 Carry Out investigations Remark : this procedure presupposes that laboratory capacities are available	**5.0 Response**	**6.0 Ensure feed back**	**7.0 Evaluate and improve the system**
• Support case investigation activities, such as presentation of a problem in the community, screening, collection of samples etc. • Initiate and/or participate in investigations on notified epidemic out breaks; • Collect, pack, conserve and transport samples for analysis in the laboratory; • Use results from the	• Assist health authorities to choose response activities ; • Participate in response activities; • Mobilize appropriate community resources for response activities; • Carry out health education activities within the community • Manage cases and contracts according to standardized directives ,	• Provide to members retro-information on notified cases and prevention activities • Give community members retro-information on notified cases and protection activities. • Alert the neighbouring health services about the outbreak, • Provide regular and	• Determine if the public health action was implemented as planned (external evaluation); • Evaluate the community response to the public health action (internal evaluation) • Evaluate timeliness, completeness and accuracy of notification on a case by case basis; • Evaluate the detection and routine notification of priority diseases; • Evaluate the state of preparation

investigations and proof from the laboratory to confirm the outbreak; • Analyze and register results from the laboratory, Communicate results to health care personnel and eventually to patients • Organize and investigate notified epidemic outbreaks • Help the health centre facilities to take a sample, pack, conserve and transport it in a secure manner for confirmation in the laboratory; • Receive and interpret	• Take appropriate measures to fight the epidemic; • Carry out public health response activities in collaboration with district health authorities; • Mobilize the participation of the community in response interventions; • Mobilize resources • Choose and implement appropriate response measures in relation to public health (for example, in relation to the disease, strengthen the team in charge, carry out vaccination activities, strengthen activities to	periodic retro-information to health centres related to activities being implemented to control the outbreak. • Provide retro-information, • Alert neighbouring health services about the outbreak ; • Provide regular updates on all activities related to the control of epidemics. • Provide retro-information to each level on response	of response activities and punctuality or promptness of these activities; • Determine if management of cases is done appropriately; • Take measures to improve notification exercise; • Take measures to improve pre-requisite planning of immediate response to epidemic out break; • Keep in contact with the community to maintain pre-requisite planning and prevention activities • Determine timeline between reception of samples and turnaround time of results; • Control quality of laboratory results;

results from the laboratory; • Determine if the notified epidemic outbreak is confirmed; • Notify the confirmed outbreak to the next level, • Distribute sample kits for special surveillance activities; • Support investigation activities related to notified epidemics by mobilising supplies, logistics, equipments, and budget • Collaborate, with other departments during the investigations. according	fight and prevent the outbreak; • Summon the committee in charge of epidemic response • If need be, provide training on management of emergencies; • Plan, in time, community information and education activities; • Inform neighbouring health services about the confirmation of epidemic outbreak • In collaboration with the district plan, implement measures to control and respond to the outbreak.	activities; • Regularly and periodically, provide retro-information to Districts on activities implemented in response to epidemics; • Periodically prepare and distribute the weekly epidemiological bulletin of the Ministry of Health (MINISANTE) • Give retro-information on collaboration with national and regional	• Control and evaluate program objectives and indicators meant to measure the quality of surveillance system; • Control and evaluate the punctuality and exhaustiveness of the notification by the district health structures; • Control and evaluate the punctuality of responses to epidemics; • Evaluate detection and notification activities and make the necessary improvements; • Control and evaluate the punctuality and exhaustiveness of the notification by District health authorities;

to needs, • Alert the laboratory and support its confirmation activities: by mobilising supplies, transport, logistics, transport of samples; • Support investigation activities related to notified epidemics: supplies, logistics, equipment, budget; • Collaborate, according to needs, with other ministerial departments during the course of the investigation; • Notify confirmed outbreak to other regional or	Play a catalytic role in the district committee to fight epidemics; • Sensitize the local administrative authorities on epidemic problems. • Prepare policies and procedures for response to epidemic outbreaks and priority diseases; • Support district hospital to fight epidemics and pre-requisite planning activities; • Communicate ongoing measures of prevention through information meetings and media (bulletins, press	level; • Inform other countries of possible cross border susceptibility of the outbreak that might have a serious impact in the region. • Disseminate results of analysis and trends, in, regional and international bulletins; • Prepare and distribute a regional bulletin on epidemiology and public health.	• Control and evaluate the punctuality of provincial support in response to the epidemic activities • Prepare and disseminate policies, surveillance procedures to fight against epidemics; • Prepare supervision policies and practices for surveillance activities ; • Evaluate detection and notification activities and improve them if necessary; • Control and evaluate programme objectives and indicators meant to measure the quality of surveillance system; • Control and evaluate the punctuality and exhaustiveness

international networks; • Analyze samples taken during the investigation and rapidly send results to each level; • If necessary, demand supplementary samples; • Participate in activities of the district team responsible for the prevention and control of epidemics • Communicate recommendations and laboratory confirmation concerning investigations on the case; • Mobilize resources for investigation activities	communiqué, direct radio-televised debates etc) • Support response activities by providing (technical expertise, directives); • Inform international experts response activities to epidemics and provide minutes on this subject • Calculate response indicators and notify the final state to the next level; • Assist the Ministry of Health (MINISANTE) to put in place epidemiological response and develop public health action plan.		of the notification by intermediary levels; • Control and evaluate punctuality of the national support to respond to epidemics; • Control and evaluate the efficiency of response activities to epidemics at the level of the District ; • Control prevention systematic activities and modify them if necessary; • Control the quality of laboratories at lower levels • Use country reports to evaluate epidemiological surveillance system and propose possible improvements

and confirmation on the basis of needs and requirements at national level; • Provide equipment to laboratories and ensure training for personnel; • Prepare directives for epidemics and epidemiological investigations; • Participate in investigations if necessary.			

WHAT DOES THIS TECHNICAL GUIDE PROPOSE?

This manual provides basic general orientation on surveillance, response and practical directives which can be used as:

- General reference for surveillance activities at all levels ;
- A set of definitions determining the threshold from which response activities to specific diseases can be based ;
- Autonomous reference for specific directives at each level ;
- Resource for developing training, supervision, and evaluation of surveillance activities ;
- Guide to improve early detection of potential outbreaks to strengthen and accelerate appropriate response measures.

TO WHOM ARE THESE DIRECTIVES ADDRESSED?

Information and recommendations presented in this guide are meant for health personnel responsible for coordination of surveillance activities at national, District and health centres level. They also concern the following persons:

- In the community: Community health workers, local leaders, trained traditional midwives, religions leaders, and other resource persons;
- Health centres: (in- charge, health personnel and laboratory technicians);
- District: Managerial staff, (Health, Director, Hospital Director, NGO representatives, supervisors, in-charge of monitoring and evaluation, in-charge of the District pharmacy) laboratory technician at District level, preparedness and response committee;
- Ministry of Health: Directorate of Clinical Services, TRACPLUS (EID Division) National Reference laboratory, Maternal Child Health, Central University Teaching Hospitals (CHU Directors. laboratory technicians of CHU) ;

WHICH ARE THE PRIORITY DISEASES INCLUDED IN THIS GUIDE?

Nineteen diseases are recommended because they form part of/ one or more of the following categories:

- A disease causing the high morbidity and mortality in the African region (for example : malaria, pneumonia, diarrhoea, tuberculosis etc);
- A disease with epidemic potential (for example: plague, yellow fever, cholera)
- A disease which, is very lethal and requires international surveillance (for example: plague, yellow fever, cholera);
- Diseases that require effective control and prevention intervention mechanisms to respond to the public health problem they pose: (for example: schistosomiasis, onchocercosis, trypanosomiasis, etc).
- The disease forms part of the world initiative program for prevention and control, elimination or eradication of the disease (for example : neo- natal tetanus, polio, leprosy)

TABLE 3: LIST OF EIGHTEEN PRIORITY DISEASES

Seventeen recommended diseases
Diseases which are of epidemic potential
1. Cholera ; 2. Bloody diarrhoea ; 3. Epidemic typhus, 4. Meningitis; 5. Plague; 6. Typhoid fever 7. Rabies 8. Viral hemorrhagic fever; 9. Yellow fever; 10. Non- bloody diarrhoea; 11. Malaria; 12. Influenza-like illness 13. Severe pneumonia in children below 5 years of age. 14. Pertussis 15. Diphteria
Diseases chosen for eradication and elimination
16. Acute Flaccid Paralysis (AFP/Polio); 17. Measles; 18. Neo-natal tetanus

SECTION 1: IDENTIFY CASES OF PRIORITY DISEASES AND CONDITIONS

This section describes how to:

- Use standardized case definitions for the notification of suspected priority diseases and conditions
- Update district procedures for surveillance and response
- Use the laboratory network to improve capacity for surveillance and response including ability to confirm suspected outbreaks

IDENTIFY CASES OF PRIORITY DISEASES AND CONDITIONS

Suspected outbreaks of cases of priority diseases and conditions can come to the attention of the health system in many ways. For example:

- A person falls sick and seeks treatment at a health facility;
- Community members informs the health facility about a suspected isolated case; a cluster of deaths or any unusual event;
- A pharmacy reports an increase in purchases of a drug or a particular treatment;
- A school reports a growing number of absenteeism in pupils presenting similar signs and symptoms;
- During active search of supplementary cases of a particular disease, the surveillance officer might discover cases that are not notified related to other priority diseases. For example an officer who normally reviews a clinic register in search for cases of acute flaccid paralysis, also sees that suspected cases of other vaccine preventable diseases such as measles, neonatal tetanus, meningitis has been recorded in clinic register;
- Radio, television or newspapers report an unusual health event; an individual health facility reports a single adult death due to bloody diarrhoea.
- During analysis of the routine reports from all the facilities in the area, the district officer notices that other health facilities in the catchment area have also reported adult deaths due to bloody diarrhoea.
- The local administration may draw attention to these unusual events. For example when the vital statistics reveal an increase in neonatal deaths.

USING STANDARD CASE DEFINITIONS

A standard case definition is an agreed-upon set of criteria used to decide if a person has a particular disease or condition. The definition specifies clinical criteria and limitations on time, place and person. Using standard case definitions ensures that every case is diagnosed in the same way, regardless of where or when it occurred, or who identified it. This allows for comparing the number of cases of the disease or condition that occurred in one time or place with the number occurring in another time or place.

The use of the same case definition in the entire national surveillance system enables an effective detection of particular diseases or conditions. This harmonization enables us to more easily compare data from different areas. On the other hand, when health facilities and districts use different case definitions, it is impossible to determine the trend of particular diseases because health professionals who analyze the data and take the necessary measures will not know if the trend is caused by the diseases under surveillance or by another cause.

DISTRIBUTE STANDARD CASE DEFINITIONS USED TO ALL HEALTH FACILITIES

Ensure that health professionals know, have and use the standardized cases definitions specified in the national policy for the notification of priority diseases and infections at the district level.

Appendix 1.1 presents case definitions of priority diseases in the Rwandan national integrated disease surveillance system.

More information on the case definition will be found in specific recommendations for diseases that appear in Section 8 of this manual.

DISTRIBUTE SIMPLIFIED CASE DEFINITIONS TO THE COMMUNITY

It is important to involve the community in surveillance and response activities in the districts. If the community is ignorant on how to inform the health authorities about the occurrence of priority diseases or unusual health events, the suspected cases may fail to be recognized in the health facility and the cases will not be notified.Provide information to health staff, traditional healers, birth attendants and community leaders on how to recognize and report priority diseases, conditions or events to the health facility.

At the same time, emphasize the need to refer people with the suspected disease or condition for treatment. Also, provide information to the community on priority diseases, using posters, newsletters and announcements during meetings.

One way of encouraging the community to participate in the system is to be ready to respond to its notifications.

A list of simplified case definitions for use at community level is in appendix 1.2

UPDATING DISTRICT PROCEDURES FOR SURVEILLANCE AND RESPONSE

Use available assessment and evaluation results to plan improvements for surveillance and response activities in your area. Each year, national level or provincial health officials should evaluate the performance of the surveillance response system. Use the results to adjust plans accordingly to address the next issues in the prioritized list.

UPDATE THE DESCRIPTIONS OF THE CATCHMENT AREA

Update information related to the catchment area of your district at least once a year. Be sure to, for example, have updated information on:

- The size of the target population in the area of coverage of the health centre or hospital : children under the age of five, women between 15-49 years , population under the age of 15, people living in refugee camps, school drop-out youths, etc.
- The main public health interventions in the district, such as vaccination activities carried out by public institutions, private or nongovernmental organizations, sanitation projects, family planning centres, etc.
- The current major public health problems (between 5 and 10) handled in the district or in health facilities.

UPDATE THE LIST OF REPORTING HEALTH FACILITIES IN THE CATCHMENT ARE

Identify all of the health facilities, Points of Entry (PoE) and any other location in the district required to report surveillance data or events to the district level. Create relationships with private and NGO sites in the district and involve them in surveillance activities

Update health facilities and the names of the members of staff responsible for the surveillance activities.

Appendix 1.5 shows a sample worksheet for listing of notification sites and the contacts for focal person/sat each site.

DISTRIBUTE DATA COLLECTION FORMS, REPORTING TOOLS AND GUIDELINES

As you conduct updates of the catchment area description, check to see that reporting sites have an adequate supply of forms or other means for reporting surveillance data to the district

(such as radio phones, mobile phones, or email connections). Include updates about forms and procedures for reporting, investigating and responding to public health events in quarterly district meetings with health facilities and other reporting sites.

IMPROVE LOCAL LABORATORY CAPACITY FOR SURVEILLANCE AND RESPONSE

There are many diseases that present with similar signs and symptoms. For example, a child with fever and skin rash all over his body can be diagnosed as a case of measles yet he may be having rubella, chicken pox.

Laboratory confirmation of diagnoses of diseases, conditions and events under surveillance is essential in order to:

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

Based on laboratory analysis, the accuracy of the diagnosis and the efficiency of the actions of public health are increased. This confirmation helps to ensure that the surveillance data collected (for example, the number of cases of measles diagnosed after clinical signs and symptoms) will not attract unnecessary health interventions (for example the introduction of a campaign of vaccination against measles when measles is not the case).

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

- Specimen is collected inappropriately, for example, a blood specimen has hemolysed.
- Delay in transportation and processing may result in bacterial overgrowth in the collected specimen such as urine and CSF.
- Use of wrong transport or storage media may cause reduced viability of the suspected organism.

A summary of laboratory test available at each level of the laboratory network are found in Appendix 1.3; appendix 1.4.

ESTABLISHING COMMUNICATION WITH THE DESIGNATED LABORATORIES

The surveillance or laboratory focal person should establish or strengthen routine communication with identified laboratories that receive specimens from your health facility or district. The purpose of this routine contact is to strengthen procedures between the health

facilities in the district that will be sending specimens, and the laboratory that will be receiving them. Ensure that the procedures for specimen collection, transportation, confirming the disease or condition and reporting the results are clear and can be reliably carried out.

The national level shall support designated laboratories through advocacy with higher levels in accessing the necessary supplies to collect, handle, store, and ship specimens safely through the network

INFORM LABORATORIES ABOUT PROCEDURES FOR CONFIRMING PRIORITY DISEASES

The director of the district hospital laboratory/focal person will ensure that the procedures of confirmation in laboratory are known and applied in the district. The designated staff should:

- Help the health facility to determine the time when to collect a sample for confirmation of a suspected case;
- Collaborate with the laboratory, when necessary, to identify the correct samples for collection and any other particular difficulties or procedures;
- Collect and correctly pack the samples ;
- Ensure the safety or the reliability of transport of samples between the health facility and the district;
- Receive the laboratory results and quickly communicate them to the health facility and to national centres.
- In collaboration with health facility, take action according to laboratory results

ESTABLISH LABORATORY QUALITY CONTROL

Coordinate with provincial or national laboratory authorities to establish activities for ensuring quality results from laboratories in the catchment area. Laboratory quality control and quality assurance are important for building confidence in the results obtain

APPENDICES FOR SECTION 1

Appendix 1.1: Recommended case definition recommended for the notification of priority diseases or infections by HFs

Appendix 1.2: Simplified case definition for community surveillance

Appendix 1.3: Test performed at each level of laboratory network

Appendix 1.4: Samples for laboratory confirmation of priority diseases

APPENDIX 1.1: RECOMMENDED CASE DEFINITION FOR NOTIFICATION BY HEALTH FACILITIES

The Ministry of Health recommends to health facilities to use the following case definitions for the notification of suspected cases of priority diseases and infections in the districts. Please refer to specific guidelines to diseases (section 8) for more information on the definition of specific cases.

Epidemic prone diseases	
Cholera	Any person aged 5 or more who develops a severe dehydration or dies of acute watery diarrhoea
Bloody diarrhoea (*Shigellosis)*	Any person with diarrhoea and whose stool contains visible traces of blood
Diarrhoea among children under the age of 5.	***Diarrhoea with mild dehydration:*** Any child under five years old suffering from diarrhoea and presenting two of the signs below - Restlessness or irritability - Sunken/hallow eyes - Intense thirst - Slow skin retraction after pinching ***Diarrhoea with severe dehydration*** Any child under the age of 5 suffering from diarrhoea and has at least two of the following signs: - Lethargy or unconsciousness - Sunken/hallow eyes - Does not drink or drinks with difficulty - Slow skin retraction after pinching
Epidemic Typhus	Any patient with sudden onset of fever, chills, headache, generalized pain, prostration, maculo-papular skin rash that is concentrated in inter-digital spaces of the hands and feet and sparing of leaving out the face, at times accompanied by

	conjuctival injection, petechiae and haemorrhage.
Meningitis	Suspected case: Any person with a sudden onset of fever (rectal temperature : >38.5^{o}C, axillary: >38.0^{o}C) presenting with one of the following signs: stiff neck, altered conscience or other meningitis syndromes (projectile vomiting). **Confirmed case**: A suspected case confirmed by isolation of *N. meningitidis* from CSF or blood
Plague	Any person with a sudden onset of fever, chills, headache, severe discomfort, prostration and very painful swelling of lymphatic nodes or coughs with bloody sputum, chest pain and breathing difficulties.
Rabies	Any patient, who after being bitten by a dog complains of : • Painful tingling in the bitten area • Shaking/trembling, contracture and painful spasms triggered by water quickly developing into a coma; • Sometimes character disorders, sadness, sobs and some excessive fever • Change in the voice tone; • Difficulty of swallowing • Intense salivation
Viral hemorrhagic fever	Any person seriously ill, with fever and the following signs: blood in stool, vomiting blood or unexplained bleeding in gum, nose, vagina, skin or eyes.
Yellow fever	Any individual with a sudden onset of fever followed by jaundice in the next two weeks that follow the appearance of the first symptoms
Watery Diarrhoea	A person with three watery stools or more within 24 hours
Malaria	**Simple malaria :** Any person with fever with headache, backache, chills, sweat, myalgias, nausea and vomiting with positive laboratory tests.

Influenza Like Illness	A person with fever ≥ 38^0C and a cough or sore throat in the absence of any other diagnosis
Severe Pneumonia in children under the age of 5	Any child aged 2 months to 5 years who breathes with difficulty and has a general sign of danger or intercostal retraction or a stridor The general signs of danger are the following: inability to drink or breastfeed, vomiting, convulsion, lethargy or unconsciousness.
Diphteria	**Suspected case** An illness characterized by: – laryngitis or pharyngitis or tonsillitis, and – an adherent membrane on the tonsils, pharynx and / or nose **Confirmed case** – Isolation of *Corynebacterium diphtheriae* from a gram stain or throat culture from a clinical specimen, or – Histopathologic diagnosis of diphtheria **Note:** – The increase by at least four of the serum titer of antibodies has meaning only if both serum samples were collected before administration of diphtheria toxoid or antitoxin. – Asymptomatic persons with cultures of C. diphtheriae positive (asymptomatic carriers) do not meet the definition criteria and should be neither notified nor as probable cases as confirmed cases
Pertussis	**Suspected case** Person presenting a cough for at least two weeks with at least one of the following signs: – Paroxysmal coughing (paroxysms) – Recovery inspiratory (deep breath called whoop) – Vomiting after coughing (that is to say immediately

	triggered by coughing) without other apparent cause. **Confirmed case** – Isolation of Bordetella pertussis (the germ is identified in respiratory secretions (sputum or pharyngeal specimens), or – The genetic material of bacteria is identified in nasopharyngeal aspiration by PCR (polymerase chain reaction)
Diseases to be eradicated and eliminated	
Acute flaccid paralysis (AFP) polio	Any child under the age of 15 years affected by sudden onset of flaccid (non spastic) paralysis of one or more limbs or a person of any age whom the clinician suspects of polio.
Measles	Any person with fever and generalised maculopapular rash (non vesicular) accompanied by h cough, coryza or conjunctivitis (red eyes).
Neonatal Tetanus	Any newborn with a normal ability to suck and cry during the first two days of life, and who, between the 3rd and 28th day of age, cannot suck normally, and becomes stiff or has convulsions or both
Enteric fever (Typhoid)	**Suspected case:** Any person with gradual onset of steadily increasing and then persistently high fever, chills, malaise, headache, sore throat, cough, and, sometimes, abdominal pain and constipation or diarrhoea. **Confirmed case:** Suspected case confirmed by isolation of *Salmonella typhi* from blood, bone marrow, bowel fluid or stool.

APPENDIX 1.2: SIMPLIFIED CASES DEFINITIONS FOR COMMUNITY SURVEILLANCE

It is important to give to community health workers, traditional healers, birth attendants and health workers who carry out extra-institutional activities in remote areas and to community leaders, information on priority diseases and infections targeted by a surveillance program. Simplified messages will be used such as those mentioned below to help the community determine at what time a person presents these signs must be sent to a health facility.

Suspected diseases	Warning signs for the community
Acute flaccid paralysis	All acute paralytic diseases
Severe watery Diarrhoea	Any individual who has produced 3 watery stools or more in the last 24 hours and showing signs of dehydration
Cholera	Every person aged 5 years and above with frequent liquid stool
Bloody diarrhoea	Every person suffering from diarrhoea and whose stool contains visible traces of blood.
Malaria	Every sick person with high fever, malaise and weakness
Measles	Every person with fever, skin rash and red eyes.
Meningitis	Every person suffering from fever , headache and neck stiffness or vomiting
Neonatal tetanus	Every newborn aged 2 to 28 days is unable to suck or breastfeed
Plague	Any individual showing painful swelling under the arm or in the groin. In the region affected with plague, any person with cough, chest pain and fever.
Pneumonia under 5 years	Every child below the age of five who coughs and who breathes fast or breathes with difficulties.
Viral hemorrhagic fever	Any person suffering from an unexplained illness and affected by fever and bleeding or died of unknown severe disease

	accompanied by these symptoms.
Yellow fever	Every person suffering from fever whose eyes and skin have turned yellow.

APPENDIX 1.3: TESTS PERFORMED AT EACH LEVEL OF A LABORATORY NETWORK

laboratory tests for diagnosis and monitoring	**Primary level (Health centres)**		**Second level (District hospitals)**		**Third level (Referral hospitals)**		**Referral laboratory**
	Send out	On site	Send out	On site	Send out	On site	On site
Microbiology							
Bacteriology							
Specimen collection, storage and transport for further tests	X		X		X		X
Gram staining		X		X		X	X
Urine analysis of fresh specimens		X		X		X	X
Vaginal swabs wet preparation		X		X		X	
Culture using urine, stool, blood, pus, swabs, and body fluids				X		X	X
Sensitivity test of isolated bacteria				X		X	X
Culture, identification, and sensitivities of epidemic bacteria				x		X	X

Serotyping of bacteria							X
QA/QC		X		X		X	X
Mycobacteriology							
Specimen collection, storage and transport for further tests	X		X		X		X
Microscopy: Ziehl method		X		X		X	X
Microscopy: Fluorescent method	X			X		X	X
TB Rapid test				X		X	X
Culture for TB						X	X
Extrapulmonary TB	X		X	X	X	X	X
First and second line Resistance testing for mycobacteriology							x
QA/QC		x		X		x	X
Mycology							
Specimen collection, storage and transport for further tests	X		X		X	x	X
Wet preparation (e.g. KOH)				X		X	X
Staining (e.g.Methylene blue, India Ink,etc)				X		X	X
Cryptococcal Antigen Test				X		X	X
Culture and identification						X	X

Sensitivity test							X
QA/QC		X		X		X	X
Parasitology							
Specimen collection, storage and transport for further tests	X		X		X		X
Examination and identification of blood parasites Examination of fresh stool and urine for parasites (without concentration)		X		X		X	X
Use of Iodine and Giemsa stain		X		X		X	X
Using concentration methods (e.g. Kato-Katz)				X		X	X
Specialized stains (e.g. modified Ziehl)						X	X
QA/QC		X		X		X	X
Food microbiology							X
IMMUNO-VIROLOGY							
Serology							
Specimen collection, storage, and transport for further tests	X		X		X		X
HIV rapid tests		X		X		X	X

Syphilis RPR		X		X		X	X
Pregnancy tests		X		X		X	X
Rapid tests (screening) for Hepatitis B and C		X		X		X	X
TPHA				X		X	X
CRP				X		X	X
ASLO				X		X	X
Rheumatoid factors (RF) Screening for Toxoplasmosis and Rubella				X		X	X
Confirmatory tests (e.g. Hepatitis, HIV, etc)						X	X
ELISA	X			X		x	x
QA/QC		X		X		X	X
Western blot							X
Autoimmune diseases Diagnosis							X
Virology							
Viral culture (e.g. Influenza; Herpes; HIV, etc) and identification							X
Molecular Biology							
Specimen collection, storage, and transport e.g. viral load	X		X		X		X

and DBS (Dried Blood Spot) etc							
Viral load tests							X
PCR (e.g. Neisseria Gonorrheal, Chlamydia Trachomatis, HIV, etc)							X
DNA sequencing							X
Genetic testing(e.g:hemopathies)							X
Hematology							
Specimen collection, storage and transport for further tests	X		X		X		X
Hematocrit		X		X		X	X
Hemaglobin		X		X		X	X
White Blood Cells with differential count		X		X		X	X
ESR		X		X		X	X
Full Blood Count				X		X	X
CD4 Absolute/ percentage				X		X	X
Reticulocyte Count				X		X	X
Sickle Cell test				X		X	X

Coagulation : bleeding time, clotting time, PTT/PT				X		X	X
Blood grouping and Rh		X		X		X	X
Cross matching				X		X	X
• Coombs test				X		X	X
• Haemostasis Factors						X	X
• Analysis of bone marrow aspirate						X	X
• QA/QC		X		X		X	X
Biochemistry							
Specimen collection, storage and transport for further tests	X		X		X		X
Urine analysis using dipsticks and sediment		X		X		X	X
Blood glucose		X		X		X	X
Liver function tests		X		X		X	X
Renal function tests		X		X		X	X
Electrolytes				X		X	X
Amylase				X		X	X
Proteins				X		X	X
Lipids				X		X	X

CSF or other fluids analysis				X		X	X
Lactate (e.g. ARV toxicity,etc)				X		X	X
Iron profile						X	X
Blood gas						X	X
Hb_{A1C}						X	X
Cardiac markers						X	X
Tumour markers							X
Hormones assay						X	X
Electrophoresis						X	X
Therapeutic drug monitoring						X	X
Toxicology						X	X
QA/QC		X		X		X	X
Histopathology/ Cytology							
Collection of Pap smear, storage and transport for further tests			X			X	X
FNA, pap smears, body fluids analysis				X		X	X
Biopsy sectioning, staining, analysis and reporting						X	X

Semen analysis				X		X	X
QA/QC		X		X		X	X
immunohistochemistry stains (Vemantine, Desmin, etc)							X

APPENDIX 1.4: SAMPLES FOR LABORATORY CONFIRMATION OF PRIORITY DISEASES

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 plans 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 hours later.	Place stool in clean, leak-proof container and label clearly. Immediately place in refrigerator or cold box not used for storing vaccines or other medicines. Ship specimens so they will arrive at designated polio laboratory within 72 hours of collection 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 action

Suspected disease or condition	Diagnostic test	Specimen	When to collect	How to prepare, store and ship	Results
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: • onset within last 5 days, and • before antibiotics treatment has started **Do not delay treatment of dehydrated patients.** Specimens may be collected after rehydration (ORS or IV therapy) has begun.	Place specimen (stool or rectal swab) in a clean, leak proof container and transport to laboratory within 2 hours. If more than 2- hour delay is expected, place stool-soaked swab into Cary-Blair transport medium. If Cary-Blair transport medium is not available and specimen will not reach the laboratory within 2 hours: • Store at 4°C to 8°C • Do not allow specimen to dry. Add small amount of 0.85% NaCl if necessary • To ship, transport in well marked, leak proof container • 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 colour changes (medium turns yellow) or shrinks (depressed meniscus), do not use the medium. The O139 serotype has not been reported in Africa and only in a few places in southwest Asia. 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 haemolytic uremic syndrome (HUS). **REFERENCE:** **"** laboratory Methods for the Diagnosis of Epidemic Dysentery and Cholera". CDC/WHO, 1999. CDC, Atlanta, GA, USA	Isolate Shigella dysenteriae type 1 (SD1) in culture to confirm shigella outbreak. If SD1 is confirmed, perform antibiotic sensitivity tests with appropriate drugs.	Stool or rectal swab.	Collect sample when an outbreak is suspected. Collect stool from 5-10 patients who have bloody diarrhoea and: • Onset within last 4 days, and • Before antibiotic treatment has started. Preferably, collect stool in a clean, dry container. Do not contaminate with urine. Sample stool with a swab, selecting portions of the specimen with blood or mucus. If stool cannot 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 laboratory within 2 hours in a clean, dry container with a tightly-fitting cap. Specimens not preserved in Cary-Blair will have significant reduction of shigellae after 24 hours. If storage is required, hold specimens at 4^{o}C to 8^{o}C, and 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
Leprosy	*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
Malaria **REFERENCE:** "Basic malaria microscopy, second edition" WHO, Geneva, 2010	Presence of malarial parasites in blood films for suspected cases admitted to inpatient facility Hematocrit or haemoglobin 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 haemoglobin*: In the inpatient setting, perform a laboratory test confirming severe anaemia	*For blood smear:* Collect blood directly onto correctly cleaned and labelled microscope slides and prepare thick and thin smears. • Allow smears to dry thoroughly. • Stain using the appropriate stain and technique. Store stained and thoroughly dried slides at room temperature out of direct sunlight. *For hematocrit or haemoglobin:* 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.

Suspected disease or condition	Diagnostic test	Specimen	When to collect	How to prepare, store and ship	Results
Measles **REFERENCE:** WHO Guidelines for Epidemic Preparedness and Response to Measles Outbreaks WHO/CDS/CSR/ISR/99.1	Presence of IgM antibodies to measles virus in serum.	Serum	Collect blood samples on 5 suspected measles cases when the number of cases exceeds the measles outbreak threshold (usually more than 5 cases in a district in a month). *In countries with an elimination target:* • Collect specimen from every suspected case of measles • Collect serum for antibody testing at first opportunity or first visit to the health facility.	For children, collect 1 to 5 ml of venous blood depending on size of child. Collect into a test tube, capillary tube or microtainer. Separate blood cells from serum: – Let clot retract for 30 to 60 minutes at room temperature. Centrifuge at 2000 rpm for 10-20 minutes and pour off serum into a clean glass tube. – If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clot retracts. Pour off serum the next morning. – If no centrifuge and no refrigerator, let blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle). Pour off serum into a clean tube. Store serum at 4°C. 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 at laboratory after 7 days. If as few as 2 out of 5 suspected measles cases are laboratory confirmed, the outbreak is confirmed. Avoid shaking of specimen before serum has been collected. To prevent bacterial overgrowth, ensure that the serum is poured into a clean glass test tube. The test tube does not need to be sterile, just clean. Transport the serum in an EPI hand vaccine carrier at 4°C to 8°C to prevent bacterial overgrowth (up to 7 days). If not refrigerated, serum stored in a clean tube will be good for at least 3 days.

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.	- Prepare the patient and aseptically collect CSF into sterile test tubes with tops - Immediately place 1 ml of CSF into a pre-warmed bottle of trans-isolate medium. - Incubate at body temperature (36°C to 37°C). - Never refrigerate specimens that will be cultured. Keep CSF for microscopic exam and chemistry in the original syringe (replace cap). Refrigerate the capped syringe and send it to the laboratory as soon as possible.	Isolation of *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 (4°C) it can be kept for up to two years after preparation. In the refrigerator, the liquid phase turns gelatinous but reliquifies at room temperature. Unused TI bottles should be kept tightly sealed. If there is any colour change (yellowing or clouding of the liquid medium) or obvious drying or shrinkage of the agar slant, the medium should not be used.

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 pestis* 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	- 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. - With buboes, a small amount of sterile saline (1-2 ml) may be injected into the bubo to obtain an adequate specimen 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.	Specimens should be collected using aseptic techniques. 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. Liquid specimens (aspirates) should be absorbed with a sterile cotton swab and placed into Cary-Blair transport medium. Refrigerate. If transport will require 24 or more hours and Cary Blair transport is not available, freeze the specimen and transport it frozen with cool packs.	Cultures should only be sent to a laboratory with known plague diagnostic capabilities or to a WHO Collaborating Centre for Plague. Plague culture results will take a minimum of 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.
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 mycobacterium are reported using various reporting methods. Refer to the criteria used by the examining laboratory.
Neonatal tetanus	*laboratory confirmation is not required.*				

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-mortem skin necropsy	*For ELISA*: Whole blood, serum or plasma *For PCR*: Whole blood or blood clot, serum/plasma or tissue *For immunohisto-chemistry:* 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:* • Refrigerate serum or clot • Freeze (-20C or colder) tissue specimens for virus isolation *For Immunohistochemistry:* • Fix skin snip specimen in formalin. Specimen can be stored up to 6 weeks. The specimen is not infectious once it is in formalin. • Store at room temperature. Formalin-fixed specimens may be 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.

Suspected disease or condition	Diagnostic test	Specimen	When to collect	How to prepare, store and ship	Results
Yellow fever **REFERENCES:** District guidelines for Yellow Fever Surveillance, WHO/GPVI/EPI/98.09 Yellow Fever. 1998. WHO/EPI/Gen/98.11	ELISA for the presence of yellow fever IgM antibodies	Serum	Collect specimen from the first suspected case of yellow fever. If more than 1 suspected case, collect until specimens have been collected from 5 to 10 suspected cases.	• Collect 10 ml of venous blood from adults, 1-5 ml from children. In a standard glass test tube, capillary tube or microtainer. • Separate blood cells from serum: – Let clot retract for 30 to 60 minutes at room temperature. Centrifuge at 2000 rpm for 10-20 minutes and pour off serum into a clean glass tube. – If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clot retracts. Pour off serum the next morning. – If no centrifuge and no refrigerator, let blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle. Pour off serum into a clean tube. • Store serum at 4°C. • 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 4°C -8°C to prevent bacterial overgrowth (up to 7 days). If not refrigerated, serum stored in a clean tube will be good for at least 3 days.

Suspected disease or condition	Diagnostic test	Specimen	When to collect	How to prepare, store and ship	Results
Human influenza caused by a new Subtype **Reference:** Recommended laboratory tests to identify avian influenza virus A in specimens from humans, WHO, revised August 2007. Collecting, preserving and shipping specimens for the diagnosis of avian influenza A(H5N1) virus infection. Guide for field operations, October 2006 WHO/CDS/EPR/ARO/2006.1	Identification of human influenza virus infections by: 1) Detection of influenza specific RNA by reverse transcriptase polymerase chain Reaction 2) Isolation in cell culture (BSL3 laboratory required for suspected new subtype) 3) Direct antigen detection (low sensitivity)	A variety of specimens are suitable for the diagnosis: • Throat swab • Nasopharyngeal swab • Nasal swab • Nasopharyngeal aspirate • Intubated patients: tracheal swab or broncho lavage fluid • Blood Specimens should be collected in the following order of priority: • Throat swab/ Nasopharyngeal aspirate • Acute serum • Convalescent Serum	Obtained specimen within 3 days of the onset of symptoms, Initial specimens (respiratory or blood) should ideally be collected from suspected patients before antiviral therapy is begun but treatment must not be delayed in order to take specimens. Optimally, paired sera (3-5 ml of whole blood), collected first during the acute phase of illness and then 14 days or later after the onset of illness, should be tested simultaneously. Specimens should be collected from deceased patients as soon as possible after death	Respiratory specimens should be transported in virus transport media. Media that could be used for a variety of viruses are commercially available. Specimens in viral transport medium for viral isolation should be kept at 4°C and transported to the laboratory promptly. If specimen is transported within 2 days, it may be kept at 4°C; otherwise should be frozen at or below 70 °C until transported to the laboratory. Repeated freezing and thawing must be avoided to prevent loss of infectivity. Sera may be stored at 4°C for approximately one week, but thereafter should be frozen at -20°C. Transport of specimens should comply with the WHO guidelines for the safe transport of infectious substances and diagnostic specimens	laboratory results should be confirmed by an approved laboratory. Any specimen with a positive result for influenza A virus and suspected of avian influenza infection/new subtype should be further tested and verified by a designated WHO CC/WHO H5 Reference laboratory. laboratories that lack the capacity to perform specific influenza A subtype identification procedures are requested to: - Forward specimens or virus isolates to a National Influenza Centre or to a WHO CC/WHO H5 Reference laboratory for further identification or characterisation. - Inform the WHO Office in the country that specimens or virus isolates are being forwarded to other laboratories for further identification or further characterization.

Suspected disease or condition	Diagnostic test	Specimen	When to collect	How to prepare, store and ship	Results
Typhoid Fever	Isolate *Salmonella typhi* from blood, stool, bone marrow, urine and serotype using Salmonella different antisera	blood, stool, bone marrow , urine	The collection of specimen must be done before antibiotics treatment. The blood is a choice of specimen to be collected during the first week of illness. The stool will be collected during second and third weeks of disease.	Blood specimens are transported on "Hemoline Diphasique "medium or "Tripcase soja" medium at room temperature. Place specimen (stool or rectal swab) in a clean, leak proof container and transport to laboratory within 2 hours. If more than 2- hour delay is expected, place stool-soaked swab into Cary-Blair transport medium. Urine and Bone marrow must be collected in sterile container	Blood culture results are usually available 6 to 8 days after receipt by the laboratory. Stool, bone marrow, urine culture results are usually available 3 to 4 days after receipt by the laboratory. Salmonella isolate should be characterized by antibiotic susceptibility.

SECTION 2: REPORT PRIORITY DISEASES AND CONDITIONS

This section describes how to:

- *Report priority diseases and conditions*
- *Record information in logbooks and treatment sheets*
- *Use of standardized methods to report diseases*
- *Improve systematic reporting practices.*

REPORT PRIORITY DISEASES AND CONDITIONS

It is important to ensure a reliable notification of surveillance data throughout the whole system so that the program managers, the heads of surveillance and other health workers can use the information to:

1. Identify emerging problems and plan appropriate interventions
2. Make timely evidence-based decision
3. Monitor disease trends at health facility, district, and national levels.

The national policy determines the types of data collected from districts and health centres that have to be reported immediately or on a weekly basis.

These guidelines recommend three types of report:

- ***Immediate report:*** Report information of epidemic-prone diseases cases or conditions that require immediate notification. Notify also diseases targeted for elimination or eradication or when an epidemic threshold has been reached.
- ***Weekly summary report:*** Report systematically the total number of cases and deaths seen during the week (see weekly reporting form in appendix 2.3.). The summary report is analyzed and results will help to assess progress made towards disease control, to evaluate preventive interventions in the district, and to identify outbreaks and events that have not been detected, in order to provide timely responses.

  All immediately reportable cases should be reported in on the corresponding weekly report.

  The weekly reporting is done as follows depending on the level of the health facility:

  - From health centre to a district hospital: every Monday, no later than midday (12:00).
  - From the district hospital to RBC/IHDPC (EID Division): every Tuesday, no later than midday (12:00)

- From RBC/IHDPC (EID Division) to the Ministry of Health every Thursday, no later than midday (12:00).

TABLE 4: THE CONVENIENT TIME FOR REPORTING A SUSPECTED OUTBREAK AND APPROPRIATE COMMUNICATION CHANNELS

Disease	**Time to report a potential impending epidemic**
For the following diseases, a single case is considered as an outbreak: - Acute flaccid paralysis(AFP) - Blood diarrhoea - Cholera (where the disease is rare/ non endemic zone surrounding Kivu Lake) - Epidemic Typhus - Measles (elimination) - Neonatal Tetanus - Meningitis - Plague - Viral hemorrhagic fever - Typhoid fever - Yellow fever - Rabies - Pertussis - Diphteria - Any public health event of international or national concern (infectious, zoonotic, food borne, chemical, or due to unknown condition).	Immediate case-based report to the district with all information as soon as an outbreak is suspected Send the initial report using the fastest communications means (phone, telecopy, e-mail, internet, radio) Submit a written report with a form including details of each case send weekly consolidated information Write ‘zero’ if no suspected or confirmed case was seen during the specific time. As regards to bloody diarrhoea cases: take into account the epidemic threshold as they are frequent.

For the following diseases, report the summary data of cases and deaths - Influenza Like Illness - Non bloody Diarrhoea - Malaria - severe pneumonia among children < 5 years	Health facilities send consolidated data to the district on weekly basis. The district sends a consolidated weekly report from their catchment area to the national level (EID Division). When analysing the weekly summary reports, consider the alert thresholds and specific interventions for certain diseases

REPORT IMMEDIATE REPORTABLE DISEASES AND OR UNUSUAL CONDITIONS

Whenever you suspect a disease that needs to be reported immediately or a priority epidemic disease, there should be a possibility of sending to the higher administrative level the information about the area, the vaccination coverage, the date of onset of symptoms and other relevant risk factors. Verbal or written announcement should reach the district level within 24hours as from the time when the health facility identified the case for the first time.

Equally, you have to report immediately every unusual event identified by the community such as high death rates caused by persistent fever despite treatment with antipyretics. The information on the event may be sent through various channels including verbal message, phone call or written report or by sending an e-mail. For some diseases, a quick alert is essential as prompt measures have to be taken to control the spread of the disease or avoid the occurrence of similar cases.

REPORT CASE-BASED INFORMATION

After the initial verbal report, you will have to fill in the case-based reporting form. If verbal reporting is not possible, this form will serve as the first notification received by the district about the concerned case. A sample of the form and instructions on how to complete it are attached on appendix 2.2 at the end of this section and consists of the following elements:

- The patient's name. When reporting a neonatal tetanus case, the mother's name is required
- The patient's date of birth, if known or his/her age
- The patient's sex
- The patient's home address (Village, Cell, sector, Administrative District,)
- Date on which the patient had a medical check-up and the date on which the case was reported to the district

- Date of onset of symptoms (refer to disease case-definitions in the guidelines for the signs/symptoms, and determinants of the disease)
- When reporting a suspected case of vaccine-preventable disease, describe the vaccination status of the patient (and that of the mother in case you suspect a neonatal tetanus)
- The patient's condition at reporting (if his/she is admitted at the hospital, you have to specify the final end result: alive or dead)
- How to reach the patient or his relatives whenever there is a strong need to have further information.
- The date of the report. The health worker filling in the form has to state his/her name and the date on which the document was forwarded to the district.
- The patient's identification number (provide the code)
- The patient's electronic identification number (a code provided by the electronic reporting system (e-IDSR TRACnet) after submitting the report) if applicable.

You will have to produce two additional copies of the original report: A photocopy, a carbon copy or hand written one. Submit the original to the district and keep a copy in the health facility. The second can serve as a sending slip for a laboratory analysis, if a sample has been taken. Send to the laboratory the copy of the form for each case attached to the sample.
For any further information concerning laboratory test requested, refer to section 1.0 or to the specific guidelines on diseases under section 8.

REPORT ROUTINE WEEKLY SUMMARY DATA

Each week, the health facility makes the total of cases and deaths caused by the priority diseases and infections recorded in the health facility. When adding up the total, you have to separate cases that have been admitted to the hospital, the deaths that occurred and the outpatients' cases. Data will also be disaggregated by age-group. These consolidated data are recorded on a weekly consolidated form submitted to the district hospital. The district hospital will also consolidate the data from its catchment area for RBC/IHDPC.

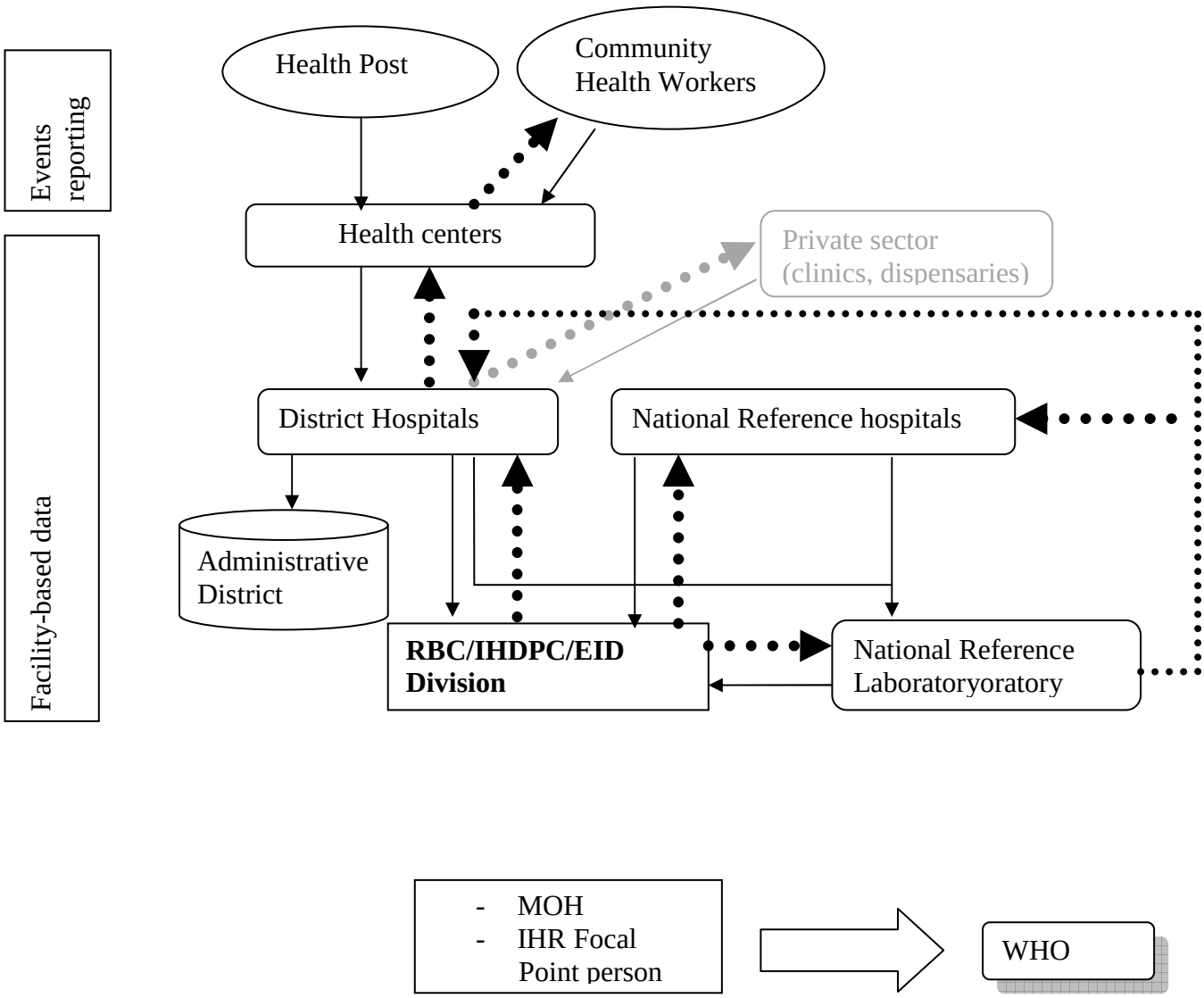
IMPROVE SYSTEMATIC REPORTING PRACTICES

In most health facilities in Rwanda, the recording of information on patients is done in more than one unit and by several people. Each health care unit owns its logbook with a number of compilation sheets. The head of the health facility and or the head of surveillance have to be attentive so that they do not miss any case of epidemic-prone disease.

***IDSR** DATA FLOW CHART*

Reporting line

Feedback



Data analysis by health facility

The Head of the health facility should ensure that:

- Clinicians record the information in the patient file/logbook using the recommended case-definition.
- Clinicians, nurses or other appointed staffs complete the case-based reporting form while the patient is still around
- The person responsible for data (M&E, data collector) or the focal point for surveillance has the tally sheets summarizing the cases and deaths due to by priority diseases
- This person knows how to fill in the reporting forms.
- The health workers check the monthly total and write his/her comments on the observation forms concerning the findings at the end of the monthly analysis (see Section 3.0.).
- The health worker records the total number on a recommended consolidated monthly reporting form.

Observation – *S*paces is available on the consolidated monthly reporting form at the end of this section to record comments generated from the analysis of the data by the data managers and or the surveillance focal point.

Submit a zero-case report - if no case of immediately reportable disease. (For example, viral hemorrhagic fever) has not been diagnosed or no weekly case reported.

In case there is no identified case of immediate reporting during the last period, write '0' on the form. If the provided space is empty, the person receiving the report cannot explain why this section was not completed. Write '0' for any disease that needs to be reported immediately, on weekly or monthly basis even if no case has been detected for the last period. This indication will allow the staff at the higher level to know that the health facility or the district has submitted a complete report.

USE A LINE LISTING FORM DURING AN EPIDEMIC OUTBREAK

When there are less than five cases caused by the same disease in a single day, record the information concerning each case on the case-based reporting form. If on the same day there are more than five cases, it would be better to use the line listing form provided to record and report cases once a week.

The instructions on how to carry out a systematic analysis of the surveillance data are detailed under Section 3.0.

Indicators of report timeliness and completeness of immediately reportable diseases are detailed in Section 7.0.
Timeliness of reporting of suspected outbreak is considered under Section 7.0.

Note: it is worth emphasizing that all this information has to be reflected into the weekly summary report as well as the monthly reports from the health facility and the districts. The head of surveillance or data manager, or the designated staff, should screen the concordance of IDSR and HMIS data on a regular basis.

APPENDICES FOR SECTION 2

Appendix 2 .1: Maintenance of clinic logbooks for priority diseases and infections
Appendix 2.2: Case-based reporting forms
Appendix 2.3: IDSR case-based laboratory reporting form
Appendix 2.4: Weekly reporting form
Appendix 2.5: Ethical considerations on the management of the surveillance data in public health

APPENDIX 2.1: MAINTENANCE OF CLINIC LOGBOOKS FOR PRIORITY DISEASES

Each health facility has to keep the logbooks for recording the priority diseases and infections identified in the health facility. A logbook should at least record the following information:

- Patient's name and age
- Patient sex
- Patient's Home address (District, sector, cell, village)
- Diagnosis (This is particularly important for reporting the consolidated data). Use the diagnosis IMCI for diarrhoea with dehydration and pneumonia among children below 5 years old.
- The patient's medical history (in internal consultation)
- Consultation date
- Treatments
- laboratory test results, if the case is to be confirmed through laboratory
- Other important observations related to the disease, treatment or the end of treatment process
- Origin (area, outside the area, outside the district)

APPENDIX 2.2: CASE-BASED INVESTIGATION FORMS

The Ministry of Health based on WHO/AFRO guidelines recommends the generic case-based reporting form when reporting immediately reportable diseases. These diseases fall into the following categories:

- Disease with epidemic potential (for instance cholera, bloody diarrhoea, measles, meningitis, plague, viral hemorrhagic fever and yellow fever).
- Preventable diseases through vaccination that need to be eradicated (Polio/PFA), eliminated (neonatal tetanus), and to be contained (measles)
- Other diseases on the list of diseases under surveillance.

In case a health facility suspects a disease or infection falling under one of the categories mentioned above, the staff from the health facility should immediately contact the district by telephone, fax, e-mail or other faster communication channels. A report confirming the verbal communication should follow.

The Case-based reporting form has two sections. The first section records information on the particular case. These data can be used when conducting further research on the case reported. The

second section is the request form (when needed). The laboratory test results and some information on the timeliness of the laboratory test results delivery to requiring health facility. If samples have been taken, a copy of the first section of the form will be filled in by the staff from the health facility and attached to the laboratory sample.

Appendix 2.2.a.: The IDS generic case investigation form

_____ _____

Reporting Health Facility Reporting
District

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

Cholera: ____	Blood Diarrhoea: _____	Epidemic Tyhus: _____	Meningitis: _____
Plague: _____	Viral Hemorrhagic Fever:_____	Tyhoid Fever :_____	Yellow Fever :_____
Rabies: _____	Pertussis : _____	Diphteria:_____	Other :_____

Date: _____/_____/_____ _____/_____/_____
Received at District level
Received form at national level

Name(s) of Patient: _____ **Date of Birth:** _____/_____/_____ or **Age:** _____ **Sex:** _____ M=Male F=Female

Patient's Residence: Village/Neighbourhood _____
District /Town/City: _____**residence:**_____ U=Urban R=Rural
Locating Information:_____
If applicable, name of mother and father if child

Date Seen at Health Facility: _____/_____/_____ Number of vaccine doses Received: _____ 9=unknown
Date Health Facility For YF- documented by card. For Meningitis, by history.
Notified District: _____/_____/_____

Dates of Onset: _____/_____/_____ Date of last vaccination: _____/_____/_____
Yellow Fever, and Meningitis

Blank variable2 #1_____ Patient status:_____ **Outcome:___**
1=In-patient, 2=Out-patient, 9=inconnu
Blank variable #2_____
1=Alive; 2=Dead; 9=unknown

Final Classification: _____
1=Confirmed
2=Suspected
3= Probable

Person Completing Name: _____
Signature:_____ Reporting date:_____/_____/_____

APPENDIX 2.2.B.: INVESTIGATION FORM FOR NEONATAL TETANUS

……

Numéro **Code du pays : RWA**

EPID Pays - Région – District – Année de début – N° du cas Reçu le :……../……../

……

IDENTIFICATION Nom de la Formation

District sanitaire :……Province sanitaire :…… sanitaire la plus proche :

District administratif :…….Secteur :…….Cellule :……...

Nom du malade :……Père/mère :……/……...

Sexe : ☐ M = masculin F = féminin U = Urbain R = Rural ☐

……

NOTIFICATION/INVESTIGATION

Notifié par:……Date de notification:… /……/ Date de l'investigation : …./……./

……

VACCINATION DE LA MERE

Mère vaccinée avec VAT ? ☐ 1 = oui 9 = inconnu 2 = non

Nbre de doses ? ☐ 1 ère : / / 2è : / / 3è : / / 4è : / / 5è : / / Si > 5 doses, date de la dernière :

Existence d'un carnet ? ☐ 1 = oui 9 = inconnu 2 = non

Statut vaccinal de la mère avant l'accouchement ? ☐ 1 = complet 2 = incomplet 9 = inconnu

……

NAISSANCEDE L'ENFANT

Date de naissance……/……/…….. Lieu de naissance : ☐ 1 = Hôpital 2 = CS 3 = Domicile/personne formée 4 = Domicile/personne non formée 5 = Domicile/AT 6 = Domicile/ sans AT 9 = inc.

Cordon coupé avec une lame stérile ☐ 1 = oui 9 = inconnu 2 = non

Cordon traité ? ☐ 1 = oui 9 = inc. 2 = non

DESCRIPTION DU TRAITEMENT DU CORDON ……

.

Mère a-t-elle reçu des soins prénataux ? ☐ 1 = oui 9 = inconnu 2 = non Où ? : ……Combien de visites prénatales ? ☐

Accouchement pratiqué par Un médecin/sage femme ? ☐ 1 = oui 9 = inconnu 2 = non

La naissance a t-elle eu lieu dans une institution ? Le nom ☐

……

Accouchement effectué par un personnel formé ? ☐ 1 = oui 9 = inconnu

AT ou sage formé ? 2 = non

Son nom :

……

ANTECEDENTS CLINIQUES

Date des symptômes ……../……./…… Le bébé était normal à la naissance ? ☐ 1 = oui 2 = non 9 = inconnu

Dos arché ? ☐ 1 = oui 2 = non 9 = inconnu Raideurs ? ☐ 1 = oui 9 = inconnu Spasmes ou convulsions ☐

Complications ? 2 = non 1 = oui 2 = non 9 = inconnu

2 = non ☐ 1 = oui 2 = non 9 = inconnu Enfant a bien crié et téter les 2 premiers jours

1 = oui 9 = inc. Enfant décédé ? ☐ de sa naissance ? ☐

Age de l'enfant le jour du décès ? ☐ A-t-il stoppé de téter ensuite ? ☐

……

TRAITEMENT ☐ ☐

Vu en consultation externe ? Admis à l'hôpital ? Date d'admission ?……/……./…….

N° du dossier ?: ……Adresse de l'hôpital ?: …….. Etat du bébé à la sortie : ☐

1 = guéri 2 = décédé 9 = inc.

COMMENTAIRE……..

……

REPONSE ☐

Mère a-t-elle reçu une dose de protection dans les 3 mois suivant la déclaration ? 1=oui 2=non 9=inconnu

Date de la réponse : ……/……/….. Vaccination supplémentaire dans la localité : ☐

Date de la vaccination supplémentaire./……../…….

……

CLASSIFICATION FINALE DU CAS

Tétanos Néonatal : ☐ 1 = oui 2 = non 9 = inconnu

ENQUETEUR

Nom…….Titre……Unité……..Tél :……Adresse

Appendix 2.2.c.: Case investigation case form for Acute Flaccid Paralysis (AFP)

Notification obligatoire, priere de remplir cette fiche pour chaque cas

A Remplir au Niveau Central **Reçu, le ……./……../……**

EPID N0 **Pays- Province-District-Année de début -N° du cas**

IDENTIFICATION

District sanitaire: **Hôpital** Province : Formation sanitaire la proche : CS
District Administratif : Secteur **:** Cellule :
Nom(s) du malade: Père/Mère**:**
Date de
Naissance : **……../……../……** Si date de naissance, Inconnue Age : **…….** ans, ……mois Sexe **:** M= masculin F = féminin ☐

NOTIFICATION/ENQUETE

Cas notifié par**:** Date de notification : Date de l'enquête:
H**OSPITALISATION** : hospitalisé : 1 = oui 2 : Non ☐ Date d'admission :
Numéro d'hospitalisation : Nom/ Adresse de l'hôpital :

HISTORIQUE DE LA MALADIE Fièvre au début la paralysie : ☐ Paralysie progressive < = 3 jours : ☐
Date de début de la paralysie : **……./……../…….** Paralysie flasque et aiguë : ☐
Asymétrique : ☐ Site de la paralysie

JG	BG
JD	BD

Après l'enquête, était-ce réellement un cas de PFA ? : ☐ Si oui, remplir le reste du formulaire

---

ANTECEDENTS VACCINAUX Naissance **:** 2^{e} : 4^{e} =
Nbre total de doses de VPO ☐ Exclus la dose à la naissance **1^{er} dose:** 3^{e} : si + de 4, la dernière :

PRELEVEMENT DES ECHANTILLONS DES SELLES Date du 1^{er} échantillon Date du 2^{nd} échantillon Date d'expédition des Échantillons au N.C.
Date de réception des selles Par le N.C. . Date d'expédition des selles vers le Labo inter pays

---

RESULTATS

D'ANALYSE DES ECHANTILLONS
--------/----/----- 1= adéquat ☐--/-----/---- ------/-----/---- P1 ☐ P2 ☐ P3 ☐ ☐
NPENT

Date de réception 2 = non adéquat

des selles au labo Etat des selles à la réception au labo Résultats envoyés au PEV National Résultats reçus/ PEV National
--------/----/----- ------/-----/---- ------/-----/---- W1 ☐ W 2 ☐ W 3 ☐ V1 ☐ V2 ☐ V3 ☐ NPENT ☐
Date d'expédition Des selles au labo de Date d'expédition des résultats Date de réception des des résultats de la diff. I.T. La Diff. I.T. La diff. I.T au PEV
1 = oui 2 = non

EXAMEN DE SUIVI CLINIQUE Observations lors du suivi ☐
Date de l'examen de suivi
--------/---------/-------- Paralysie ☐☐

1 = Paralysie résiduelle
2 = Pas de paralysie
3 = Perdu de vue

résiduelle

CLASSIFICATION FINALE DU CAS: ☐ 1 = Polio confirmée 2 = Compatible
3 = PFA non polio 4 = Pas de cas de PFA

ENQUETEUR :
Nom **:** Titre : Unité : Tél. : Adresse :

APPENDIX 2.2.D.: CASE INVESTIGATION FORM FOR MEASLES

NOTIFICATION OBLIGATOIRE, PRIERE DE REMPLIR CETTE FICHE POUR CHAQUE CAS

Officiel Numéro

Epidnumber ……. …… …… …… …… Reçu, le / /

Pays Province District Année début N° du cas

---

1. IDENTIFICATION

Hôpital de district : ……Province : ……Formation sanitaire la plus proche :

District administratif……Secteur…….Cellule…….. 1 : Urbain ☐
2 : Rural

Nom(s) du patient……Père/Mère……Sexe :1 : Masculin ☐
Date de naissance……../……../……. Ou âge……..ans ou si < 1 an âge…….(mois) 2 : Féminin
Si la date de naissance n'est pas connue

---

2. NOTIFICATION/ENQUETE

Date où le centre de santé a vu le patient :……. /……. /…… Cas notifiés par :……..

Date où le centre de santé a notifié le cas au district :……/……/…….Date de l'enquête……/……../……

---

3. HISTORIQUE DE LA MALADIE 1 : vivant 1 : oui ☐

Date du début de l'éruption **(rush) : ……/……/…, Issue :** 2 : décédé **Hospitalisé** : 2 : non ☐
3 : inconnu 3 : inconnu

Nombre des valide de **VAR** ☐ Date de la dernière vaccination :……/……/……..

---

4. ECHANTILLON DE SANG

Date de prélèvement :……. /……. /…. Date d'expédition vers le niveau national……/……/…...

Date de réception au labo :……./……../……., Date de réception des résultats au PEV :……/……/ ……

Condition d'arrivée des échantillons : 1 : adéquate ☐
2 : non

Résultats de Sérologie : **IgM rougeole** : 1 : Positif **IgM Rubéole :** 1 : Positif ☐
2 : Négatif 2 : Négatif ☐
3 : Indéterminé 3 : Indéterminé

Autres résultats : _____

Date d'expédition des résultats du labo au district qui a envoyé l'échantillon :……./……../…….

---

5. CLASSIFICATION FINALE DU CAS : ☐

1 : cas confirmé par le labo
2 : cas confirmé par lien épidémiologique avec 1 cas confirmé par le labo
3 : compatible (tests de labo non réalisés)
4 : Exclu/IgM négative
5 : Résultats en attente

---

6. SOURCE DE L'INFECTION IDENTIFIEE ☐ 1 : Oui
2 : non

Si le test de confirmation IgM rougeole est positif, investigation communautaire faite ? 1 : Oui
2 : non

Si oui, décrire le résultats de l'investigation_____
_____
_

7. ENQUETEUR :

Nom :……Titre :……Unité……..…..Téléphone……..
.

Adresse……

APPENDIX 2.3: IDSR CASE-BASED LABORATORY REPORTING FORM

DSR case based laboratory Reporting Form		
Part I. Refering health worker to complete this form and send a copy to the laboratory with the specimen		
	Variables	**Answers**
1	Date of specimen collection (day/month/year)	
2	Suspected Disease or Condition	
3	Specimen type *****	
4	Specimen unique identifier ******	
5	Patient Name (s)	
6	Sex (M= Male F= Female)	
7	Age (….. Years/……Months/……Days).	
8	Date Specimen sent to laboratory (day/month/year)	_________\
Part II. Laboratory to complete this section and return the form to district and clinician		
	Variables	**Answers**
1	laboratory Name and location	
2	Date laboratory received specimen (dd/mm/yyyy)	_________\
3	Specimen condition: (Adequate/Not adequate)	
4	Type of test(s) performed	
5	Final Laboratory Result(s)	
6	Date (dd/mm/yyyy) laboratory sent results to district	_________\
7	Date Results sent to the clinician (dd/mm/yyyy)	_________\
8	Date district received laboratory results (dd/mm/yyyy)	_________\
***** Blood, Plasma, Serum, Aspirate, CSF, Pus, Saliva, Biopsy, Stool, Uretral/Vaginal discharge, Urine, Sputum**,** food/water samples ****** Same as the patient's identifer in the IDSR immediate case based reporting form		

APPENDIX 2.4: WEEKLY REPORT FORM

IDSR weekly reporting form			
Year:	**Week**	**Month**	
Country:	**Pronvince:**	**District:**	**Population:**
District Hospital :	**Health Centre:**		
Expected reports:	**Report received:**	**Reports received on time:**	

	Disease or event to notify	**Cases**	**Deaths**	**Comments**
1	Influenza Like Illness			
2	Non bloody Diarrhoea Among children under 5 years			
3	Non bloody Diarrhoea			
4	Bloody Diarrhoea			
5	Malaria			
6	Severe pneumonia among children < 5 years			

APPENDIX 2.5: ETHICAL CONSIDERATIONS ON THE MANAGEMENT OF THE SURVEILLANCE DATA

The effectiveness of the public health activities including those related to surveillance lies in the trusted relationship between the public health workers and the population that they serve. Below are ethical standards that all health workers and epidemiologists must observe:

1. Protecting confidentiality and privacy

Ensure the patient's privacy. It is the patients' right to decide which and to whom they can reveal personal information.

Confidentiality is the obligation health workers to no disclose patient information to other than those who are absolutely in need of this to care for her/him. The Patient is entitled to know why her/his information is being disclosed, and that S/he has the right to withhold the information or to require that her/his health conditions be kept confidential.

Even if information does not even contain a name this may still be used to identify certain persons and spark discriminations or other negative consequences for the individuals. Therefore, it has, from the time it was revealed, to be protected. In many countries and districts, apparent anonymous data have been used to to identify patients or individuals. Furthermore, we will find mechanisms to protect the patient from any identification permitting the health system to seek contact details or reveal any related epidemics whenever the need arises. A sound information system is the one that would attentively screen all relevant information that would be helpful in taking public health action.

2. An informed consent

We have to ensure that the information collected is exclusively used for the purposes for which it is intended for. The community will hardly accept that the information collected for the surveillance is used for research purposes. The national regulations require the patient informed consent prior to the use of individual data for research. All health workers are required to adhere to these provisions.

3. Professionalism and public trust

To achieve public health duties such as surveillance, it is essential to have a general support from the community. This trust is a guarantee that proves that health workers are fair, reliable, and respectful towards the code of conduct and a sign.

SECTION 3: ANALYSE, INTERPRET AND COMMENT ON THE REPORTED DATA

This section gives us explanations on how:

- To collect, process and store the data ;
- To analyse data according to chronological, spatial and individual elements;
- To draw conclusions on the basis of results from the analysis;
- To compare the results of the analysis with the thresholds for public health action;
- To archive the summary of the analysis and response (Register of epidemics).

ANALYSIS OF DATA

The analysis of trends related to cases and deaths attributable to diseases during a given period of time has many advantages because it provides key messages enabling:

- The identification of trends and timely appropriate public health measures;
- The identification of the origin of cases and data;
- The disclosure of the reasons of problems and the search for adequate solutions;
- The evaluation of the quality of public health programmes in the District in the medium and long term.

The analysis of surveillance data yields two important facts:

- In case of an outbreak of a disease or a given phenomenon, the information from the analysis of data enables the identification of the most appropriate response to control the outbreak. Immediate measures may be taken to prevent the spread of an outbreak and prevent the occurrence of subsequent cases.

- The importance or the burden of diseases varies in the course of time. Some recurrent fluctuations are predictable; for example, the increase of the number of malaria cases following a rainy season. While HIV AIDS just emerged, Tuberculosis re-surfaced, leprosies and polio are either targeted for elimination or eradication.

In this section, we will mainly study the analysis of data at all levels. However, the described procedures also apply to the data processed in Health Facilities.

COLLECT DATA PROVIDED BY HEALTH FACILITIES

The District hospital team receives two types of surveillance data that are communicated to them by health facilities including the district hospital:

- The case-based reports for immediately reportable diseases;
- The weekly summary report of cases and deaths attributable to important diseases.

OBSERVATIONS

a) Notification of cases (even suspected) for diseases that are immediately reportable must be received by the district at a latest 48 hours after consultation of the case in the Health facility;

b) The summary weekly report will be communicated at a latest by Tuesday following the ending week;

c) When an epidemic is suspected, the case and the death must be reported and represented graphically once every week. In case of meningitis, cases are reported on a daily basis.

d) When written reports are received, it is necessary to check these reports or accuracy, completeness and quality.

e) Defaulted health facilities (late submission or non submission) must be tracked and find out the root causes and provide appropriate solutions. Regular communications and collaboratoryorative efforts should be maintained with the reporting health facilities in order to improve the quality of the reporting system.

f) It is important that all health workers involved in the surveillance data collection processing, reporting understand the need to ensure privacy and confidentiality as related to the data collected. Refer to Appendix 2.6 at the end of Section 2 for advice concerning the management of the surveillance data in the area of the public health.

PREPARE THE ANALYSIS OF DATA ACCORDING TO PERSON, PLACE, AND TIME

To be able to detect outbreaks, to monitor their progression and to control public health activities, the health personnel must know:

- Where they occurred;
- When they occurred;
- How many cases occurred;
- What is the population that is most affected;
- What are risk factors that contributed to the transmission of the disease;
- What is the severity of the outbreak / lethality

This information is available in the patient's files and/or registers are more meaningful when represented as, tables, graphs or maps. Presented in this manner, the information provided is easily and quickly understood and evolutions and trends are more clearly highlighted.
The health facility should keep record of analysis performed on surveillance data in an "analysis register". That will guaranty that monthly data are used for decision-making. Results in form of graphs, tables and or maps can be displayed on the wall of the facilities and updated every month.

Analysis performed by the health facilities have to be monitored by supervisors. (*Instructions concerning the development and the updating of an analysis register are represented in Appendices 3.1 and 3.2.)*

The following table presents methods and recommended tools for the analysis of the surveillance data in order to generate information for public health actions.

TABLEAU 5: OBJECTIVES, TOOLS AND METHOD OF DESCRIPTIVE ANALYSIS OF DISEASE SURVEILLANCE DATA

Type of analysis	**Objective**	**Tools**	**Method**
According to time	To detect abrupt changes or long-term trends in the emergence of diseases, their number, and the interval between the time of exposure and the appearance of symptoms.	Present the summaries in form of: **tables, linear graphs or histograms**	To compare the number of cases declared during a given period with those during the previous period (Weeks, months, or years).
According to the location	To determine the place of the emergence of cases (especially to identify the high risk areas or the concentration of high risk populations).	Display the number of cases on a **detailed map** of the District or the affected area During the epidemic	Display the number of cases on a map and discern the clusters of cases or any relation between the location where the cases have been identified and the health event that is subjected to survey
According to individual characteristics of the person	To describe reasons for changes linked to the person in the emergence of the disease, the manner in which it triggered the change, the populations that are most exposed to the disease and potential risk factors	Represent findings related to the affected population through, tables and graphs.	Depending on the type to the disease, describe characteristics such as , age, sex, workplace, vaccine status, education level and other risks factors known for the diseases.

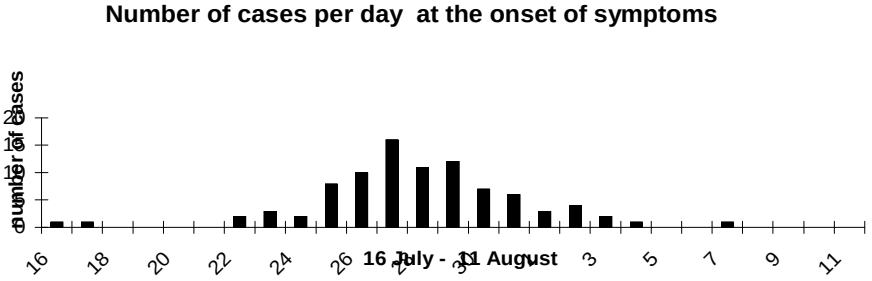
ANALYSIS AND INTERPRETATION OF DATA BY TIME

The objective of the analysis of the data according to the chronological elements is to detect variations related to the number of cases and deaths over time.Trends analysis diseases enables the identification of the time of occurrence of the recurrent fluctuations and to predict them. Changes of rates are however unpredictable. By examining events that precede the increase or the reduction of a given rate of a disease, it may be possible in certain cases to identify reasons of the change and to determine public health actions to be undertaken to control the disease and to avoid its subsequent propagation.

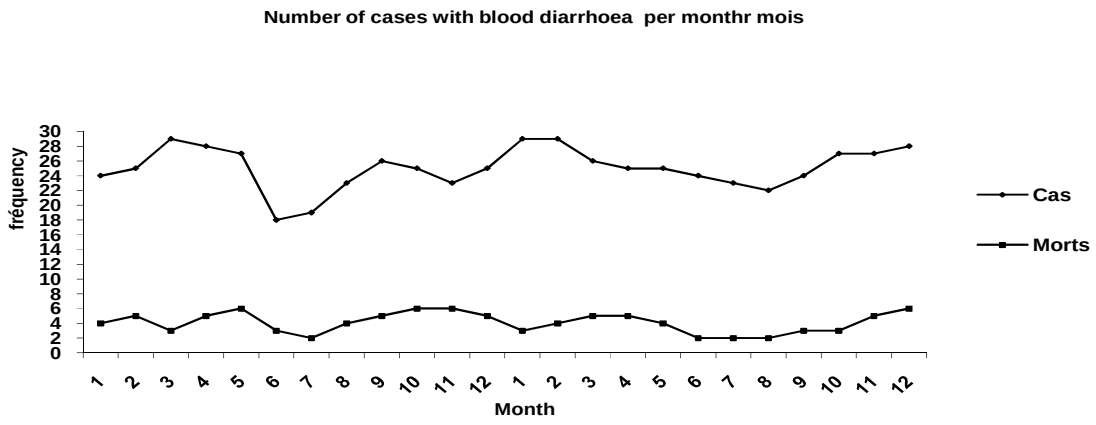
Chronological data are generally represented in form of a graph. The number or the rate of cases or deaths is placed on the vertical axis (Y) while the period under evaluation is located on the horizontal axis (X). The past events susceptible to affect the disease under scrutiny may also be indicated on the graph. For example, the date on which Health workers underwent training on the Integrated Management of Child Illnesses (IMCI).

In addition, graphs may indicate the number of cases and deaths that occurred during a specific period of time. It is easier to determine variations related to the number of cases and deaths by using a graph, especially for high numbers or if one is trying to highlight certain chronological oscillations. Graphs are composed of bars (Bar graphs), of histograms, or lines (linear curves) and measure the number of cases occurring during a certain period of time.

Example of Bar Graph

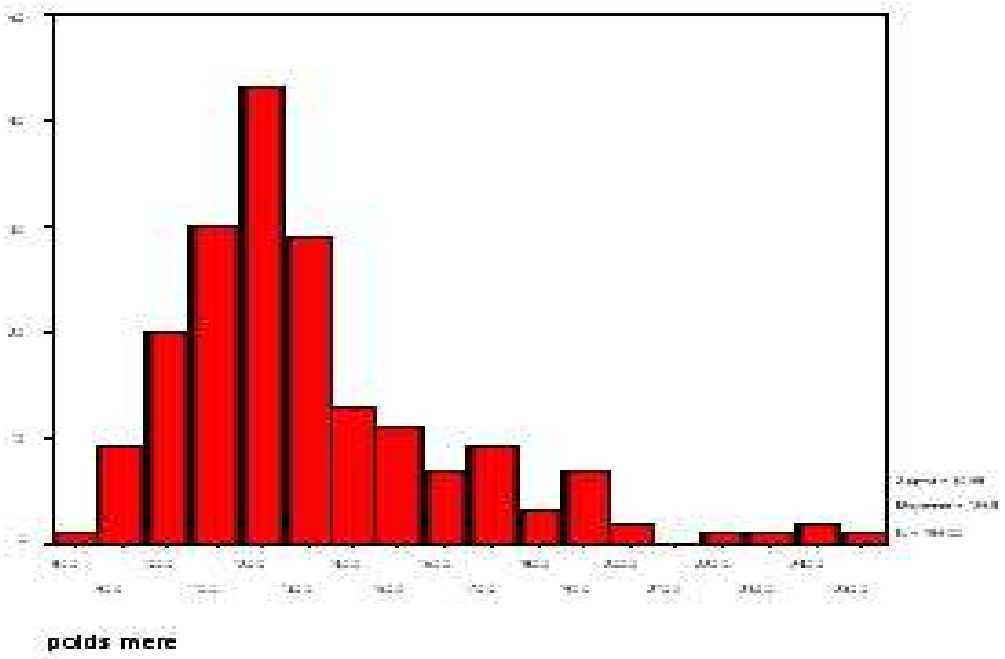


Example of the Linear Graph



The histogram, similar to the linear graph, represents cases with the help of rectangles rather than by lines joining drawn points. Histograms are used to analyse epidemiological data and to highlight an epidemic curve. For diseases with high epidemic potential, chronological evolution may be expressed by intervals of 1, 2, 3 days or of one week or by longer intervals. In a histogram, cases are represented on the graph in form of columns representing cases or deaths occurred during continuous periods of observations that are linked to one another.

Example of a Histogram



To draw this Graph, you need:

1. To determine information that you wish to indicate on the graph;
2. To compose a title that describes the contents of the graph. A good title will tell the reader about what it is, where, which person involved, when, and what the source of information is.
3. To determine the extent of numbers to be written on the vertical axis (Y axis):
   Take zero as the lowest number;
   - Rank the numbers by increasing order up to a number higher than the number of cases;
   - Select an interval if numbers to be posted on the vertical axis are high;
   - Define the laboratoryels of the number of the Y axis;
4. Define the horizontal axis (X axis) and i t units of time. This axis is divided into equal chronological time units. One generally starts with the onset of an outbreak or the beginning of a calendar period (month or year for example);
5. . Insert bars of the same width;
6. Indicate the number of cases on the graph or histogram. For every unit of time represented on the horizontal axis, assign the corresponding number of cases mentioned on the vertical axis. Fill a square per case or for a certain number of cases in the column indicating the day when the patient was seen during consultations.
7. Display deaths using a different type of line and/or changing the colour.

If you choose to use lines rather than bars or squares, draw a cross or a point at the place where the vertical and horizontal line cross each other. Join points on the graph to represent a decrease or a rise of chronological trend.

ANALYSIS AND INTERPRETATION OF DATA BY PLACE

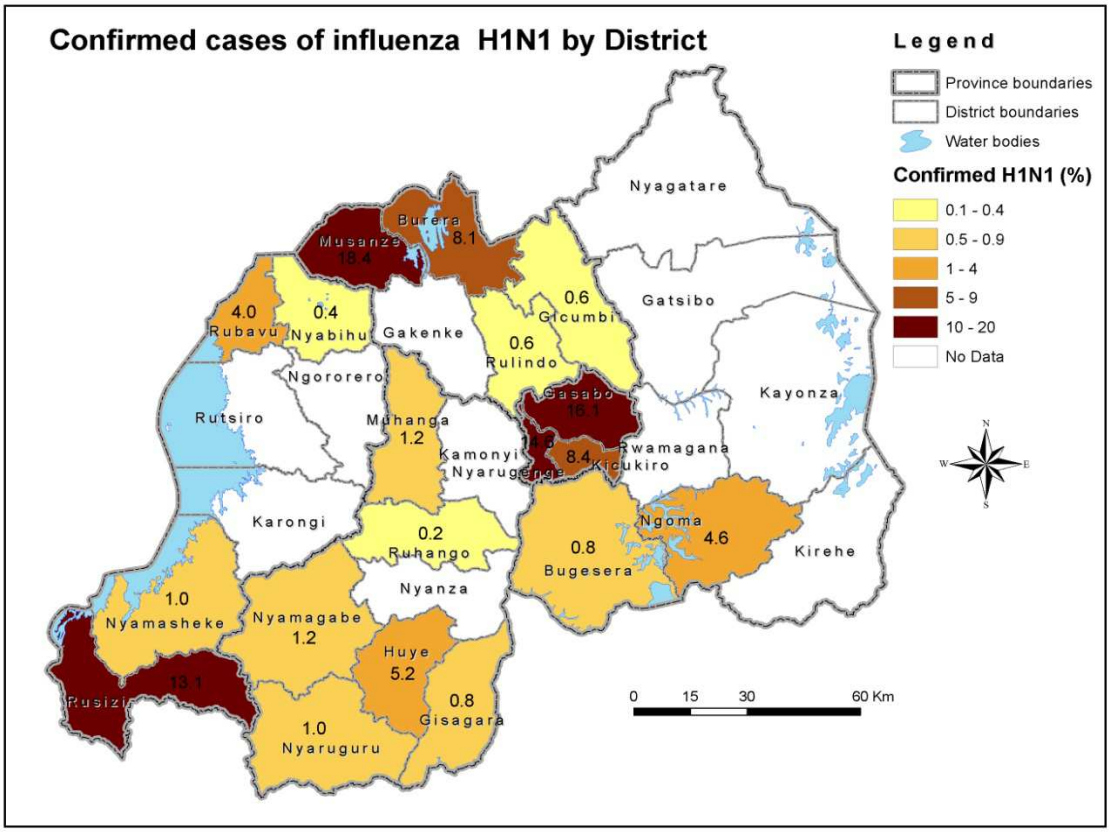
The analysis of data according to place provides information on the location(s) where a disease occurs. The elaboration and regular updating of a detailed form of cases for certain disease enable the determination in a more precise manner where, how and why the disease is spreading. The information provided by spatial analysis enables:

- The identification of the physical characteristic of the place;
- The comprehension of the distribution and the density of the population in the region;

- The description of demographic characteristics in a given zone (agricultural, urban densely populated, refugee camp, etc.);
- The description of environmental factors (Main sources of water in a community, especially rivers, lakes, pumps, etc.);
- The identification of dispensaries, gathering places, schools, community buildings and important shelters that may be used in case of emergency;
- The indication of distances between health centres and zones affected (in terms of time it takes or distance in kilometres) ;
- The planning of itineraries for activities related to the supervision or survey of cases;
- The marking of places where cases of disease occurred and the identification of populations that are most exposed to the transmission of specific diseases.

It is necessary to produce a map and to use it as a tool for routine surveillance of the disease. To achieve this activity:

- To obtain a map of the District or the country from local administration or from the land registration service. To write major features necessary for the Health action on a transparency, then on a large map that will be displayed on the wall for more convenient use. If there is no official map available, to draw the zone covering the entire district.
- To prepare a code of cartographic symbols to represent the following characteristics:
    - The location of the Health Facilities in the district and the location of the zone served by each of them;
    - Geographical zones, such as forests, mountainous areas, plateaux, savannah areas, swamps, roads and cities;
    - Socioeconomic zones with relation to priority diseases;
    - Sites of important activities such as rice fields, brickworks, mines or construction sites;
    - Places where suspected cases of priority diseases have been recorded and confirmed ;
    - Places where previous epidemic outbreaks have been recorded.



ANALYSIS AND INTERPRETATION OF DATA BY PERSON

The analysis of individual-level data is recommended to depict the populations most exposed to epidemic diseases and to those that are subject to elimination or eradication. As these diseases are case-based reported individual-level data are available. It is not recommended to systematically carry out this analysis for summary aggregated data.

A simple computation of the number of cases will not provide all information that is needed by the District. Proper comparison of the emergence and distribution of a disease in different locations or at different time periods is done through either percentages or rates of the summary number of cases and deaths

First, it is necessary to know how to distinguish the numerator from the denominator.

- The ***numerator*** is the number specific events. It is for example the effective number of cases or deaths attributable to a particular disease. Another example: the number of cases of measles occurring during the year among children aged less than 5 years.

- The ***denominator*** represents the set of possible events and from which come those

that have just been measured (For example, the size of the population in which cases or deaths attributable to a specific disease were reported or the population at risk).

Crude percentages may be used to compare information related to various sizes of the population. For example:

Health Facility	**Number of measles's cases that occurred during a year among children of school age**
A	42
B	30

If only the cases declared by the two Health facilities are compared, it seems that the measles occurs more in Health facility **A** than in Health Facility Health B**.**

When the number of cases declared by health facilities A and B is compared to the number of children of school-age in every zone of occurrence, the situation becomes clearer.

Health Facility	**Number of children of school-going age living in a targeted zone**
A	11 500
B	6 000

By calculating the percentage of the number of cases of measles during the ended year among children of school-age, the district officer may compare the impact of the disease on every Health Facility. The numerator is the number of cases recorded during one year. The denominator is the number of children of school-age at risk living in the catchment area. In this example, the incidence of the disease is higher in Health Facility B than in Health Facility A.

Health Facility	**Percentage of cases of measles among children of school going age**
A	4%
B	5%

TABULATION OF INDIVIDUAL LEVEL DATA

For every priority disease that is being subjected to surveillance, tabulation of data collected enables the analysis of disease by individual characteristics, which is also recommended for the trends of epidemics.

A table presents in a simple manner a set of data through columns and rows. Disease surveillance uses tables to display the number of cases and deaths attributable to a specific disease during a determined period of time.

Tabulation procedures

The procedure to be followed is described below:

1. Determine the information that one intends to display on the table. For example, the analysis of cases and deaths attributable to measles per age groups.
2. Define the number of columns and rows.
   Add an additional row at the bottom of the table and an additional column on the right of the table to indicate total figures. In the example, a row will be needed for every age-group category and a column for each variable such as the cases and deaths.
3. Record measurements or data in corresponding rows and columns. In the example below, the analysis is carried out annually. Indicate in every row the total number of cases and deaths. Verify if numbers have been inserted to the right place.

Age Group	Number of cases	Number of deaths
0 - 4 years	40	4
5 - 14 years	9	1
15 years and older	1	0
Unknown age	28	0
Total	78	5

COMPUTATION OF THE PROPORTION OF CASES FOR A GIVEN AGE-GROUP

After recording the number of cases per age category, one may calculate the proportion of cases that occurred in each of these groups.

Information contained in the table will enable:

1. The identification of the total number of cases declared for every age group from the aggregated data for which the chronological and individual characteristics are known (For instance, 40 cases among children aged between 0 and 4 years);
2. The computation of the total number of cases for the targeted period of time or characteristics (In the example: 50 cases whose age is known);
3. Compute the proportion of cases or deaths by age-group by dividing the total number of cases in every age –group by the total number of cases declared (For example, for children aged between 0 and 4 years, 40 divided by 50 = 0.8);
4. The multiplication of this result by 100 to get the percentage (In the example: 0.8 x 100 = 80%).

Age Group	**Number declared cases**	**% of the total of declared cases**
0 - 4 years	40	80%
5 - 14 years	9	18%
15 years and older	1	2%

COMPUTE CASE FATALITY RATE (CFR)

The case fatality rate of a disease is its capacity to kill. Among all cases of a disease that occurs in a given place, it is the proportion of cases who died. The analysis of the case fatality ***rate*** allows:

- Better understanding of problems for a timely response such as: delay in treatment initiation; poor quality of care or the absence of medical care;
- The comparison of the quality of the care provided across catchment areas , cities and Districts;
- The identification of a causal pathogen that is more virulent, emerging or drug-resistant ;

- The identification of a fragile terrain that is more receptive to diseases (For example malnutrition and infection that are linked to HIV).

Public health Programmes may lower the case fatality rate by ensuring that cases are timely detected and good quality care is provided. It is recommended to conduct an assessment of the public health response according to the trends of the case fatality rate.

Computation of the case fatality rate:

1. Obtain the total number of deaths (In the example on measles 5 deaths were reported).
2. Divide the total number of deaths by the total number of cases declared (In the example, 78 cases and 5 deaths were declared: 5 divided by 78 = 0.06).
3. Multiply this result by 100; (0.06 x 100 = 6%)

Age Bracket	Number of 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%
Unknown age	28	0	0%
TOTAL	**78**	**5**	**6%**

COMPARE ANALYSIS RESULTS WITH THRESHOLDS FOR PUBLIC HEALTH ACTION

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

Thresholds are based on information from two different sources:

- A situation analysis describing who is at risk for the disease, what are the risks, when is action needed to prevent a wider outbreak, and where do the diseases usually occur?
- International recommendations from technical and disease control program experts.

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

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

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

Several thresholds have been proposed for action based on disease surveillance findings. For rare diseases or diseases targeted for eradication, detection of a single case suggests an epidemic. In such situations, one case is unusual and is a serious event. This is because these rare or targeted diseases have the potential for rapid transmission or high case fatality rates.

In other situations, a number of cases will trigger a response. For example, the epidemic threshold for cerebrospinal meningitis in countries of the meningitis belt is 10 cases per 100,000 populations, and the alert threshold is 5 cases per 100,000.

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

Suggested thresholds for taking action in specific diseases or conditions are discussed Section 8.0.

DRAW CONCLUSIONS FROM THE ANALYSIS

Is function of the reporting frequency at the next level (once a month, for example):

Review diagrams, tables, graphs and other maps

Tools for the analysis must be verified to ensure:

- That the total number of cases and deaths being subjected to a surveillance are updated;
- That case fatality rates are calculated and are updated;
- That the geographical distribution of cases and deaths is described and includes case fatality rates as indicated.

Compare the current situation with previous months, seasons and years

1. Observe trends on linear curbs and check for the number of cases and deaths is stable, increasing or declining.
2. If case fatality rate has been calculated, how is it compared to the standard one or previous time-periods (equivalent, higher or lower)?

Determine if disease thresholds have been reached

Thresholds are indicators of acceptable level of disease or event occurrence or presence. It helps trigger actions to control outbreaks. So as to answer the question: "When to intervene?

The information supporting thresholds determination is based on two different sources:

- Analysis of the situation that presents risks, the most exposed populations, the time when it is necessary to intervene to avoid the spread of an epidemic and places where diseases usually prevail.
- International recommendations formulated by technical experts and specialists in disease control programmes. Certain Districts may decide to observe intervention thresholds for the most dangerous diseases within their zone. However, it is useless to constantly use a threshold or a trigger mechanism for a multiplicity of diseases. If the health personnel are pushed to the limit of their capacity, they will be less heedful in the surveillance of trends and less likely to react to problems.

The present guide recommends two types of thresholds: an alert threshold and an epidemic threshold. These two categories do not apply to every disease, but all diseases reach a point from which it is necessary to declare them and to take necessary measures. The thresholds defined below are continuation of the recommended practice and enable to know when it is necessary to intervene. As for thresholds destined to specific diseases,

An alert threshold suggests to the health personnel the necessity to carry out deeper survey. According to the disease concerned this threshold is reached when one case even suspected is recorded (As it is the case of a highly potentially epidemic disease or that is the subject of elimination or eradication measures) or when it is discovered that in the course of a given period of time there has been an unexplained increase of cases, according to monthly reports, for example. The health personnel react to an alert threshold:

- By reporting the suspected problem to higher echelons;
- By re-examining similar related data to previous periods;
- By asking for laboratory confirmation to find out if the problem corresponds to the definition of cases;
- By being more vigilant vis-à-vis new data and trends that results from them for the disease or the affection concerned;
- By carrying out a survey on the case or the affection;
- By warning the disease control coordinator concerned and the District team in charge of disease and epidemic control of the existence of a potential problem.

An epidemic threshold triggers a specific response. It indicates specific data or the results of survey that signal the necessity for an intervention that goes beyond the confirmation or the clarification of the problem. Among possible actions one can mention the communication of the laboratory confirmation to health centres affected, the implementation of an emergency intervention (Such as a vaccination campaign, mobilisation of human resources, available of sufficient drugs and medical supplies, logistics), a community sensitization campaign or still improve disease /disease control practices in the health system framework.

As for proposals of thresholds leading to alerting the health personnel in case of an epidemic outbreak, refer to specific instructions on diseases.

SUMMARISE RESULTS OF THE ANALYSIS

It is appropriate to study the results of the analysis by keeping in mind the following factors:

- The trends related to internal consultations describe increases or reductions linked to the most serious cases. There are more chances to detect deaths among admitted patients. The declaration of a case according to the standard definition will probably be more precise than the one of an out-patient case.

- Observed fluctuations may be caused by factors other than the real progression or regression of the number of cases and deaths. The objective of programmes related to disease control activities in your region should be to reduce the number of cases and deaths in a certain period of time.

- If this reduction does not occur and that there is stabilization or an increase of the number of cases, there is need to wonder about factors that are likely to affect the declaration, by endeavouring to answer to the following questions:
    - Has the number of Health facilities declaring the information changed?
    - Has the definition of cases used to report the disease or the affection been modified?
    - Has the increase or the reduction been a seasonal variation?
    - Were the detecting or treatment programmes really modified? Or have peripheral or Health education activities targeting communities been strengthened, thus leading to an increase of the demand for care?
    - Has the region experienced recent immigration or emigration movement or an increase of refugee populations?
    - Had there been a change at the level of the quality of services rendered by the Health Facility? For example: reduced waiting time, more welcoming health personnel, available of drugs, payable health care services.
- Compare the progress recorded during the ended month in the attainment of the objectives related to the control of the disease.
- Many public health programmes set objectives for the reduction of the disease. These objectives may apply to Health Facilities considered individually, to communities or the entire District. For the evaluation of progress recorded in the attainment of objectives on the basis of results of the analysis, it is recommended to collaborate with administrators of public health programmes.
- If results of the analysis indicate that the strategy of a programme does not lead to change or to increase the number of cases detected and treated, there is need to examine means to be deployed to improve the situation. For example, any increase or absence of the decline of the number of cases should lead to surveys or supplementary interventions that enable the improvement of the quality of the

public health programme. The following improvement measures will especially be considered:

- Increased available of drugs for the care of cases of Acute Respiratory Infections among children of less aged less than 5 years;
- Increased available of drugs at least for the pregnant women and children during the malaria season;
- Collaboration with the community health personnel to indicate to the community when it is necessary to take children to health care centres so that they are treated in case of diarrhoea with dehydration, pneumonia and malaria;
- Development of the education programme for the prevention of HIV/AIDS to reach the non school-going youth;
- Consolidated immunisation coverage in zones that are most exposed to a preventable specific disease, thanks to vaccination (measles, meningitis, neonatal and maternal tetanus, yellow fever).

SUMMARISE AND USE RESULTS OF THE ANALYSIS TO IMPROVE ACTIONS

To formulate conclusions on the basis of results of the analysis and to use them for:

- Carrying out a survey with the aim of determining which place shows the increase of the number of cases;
- Collaborating with specific diseases control programmes to intensify the surveillance when an alert threshold has been reached;
- Mobilising political leaders and the community to obtain more resources if lack of means has been identified as the reason for the increase of the number of cases.

In Section 4.0, the methodology for the survey of a public health problem will be described. In Section 6.0, emphasis will be put on the communication of the feedback to other levels of the health system and the community.

APPENDICES FOR SECTION 3

Appendix 3.1: Model for chronological analysis

Appendix 3.2 : Format for individual table analysis

APPENDIX 3.1: MODEL OF THE GRID FOR CHRONOLOGICAL ANALYSIS

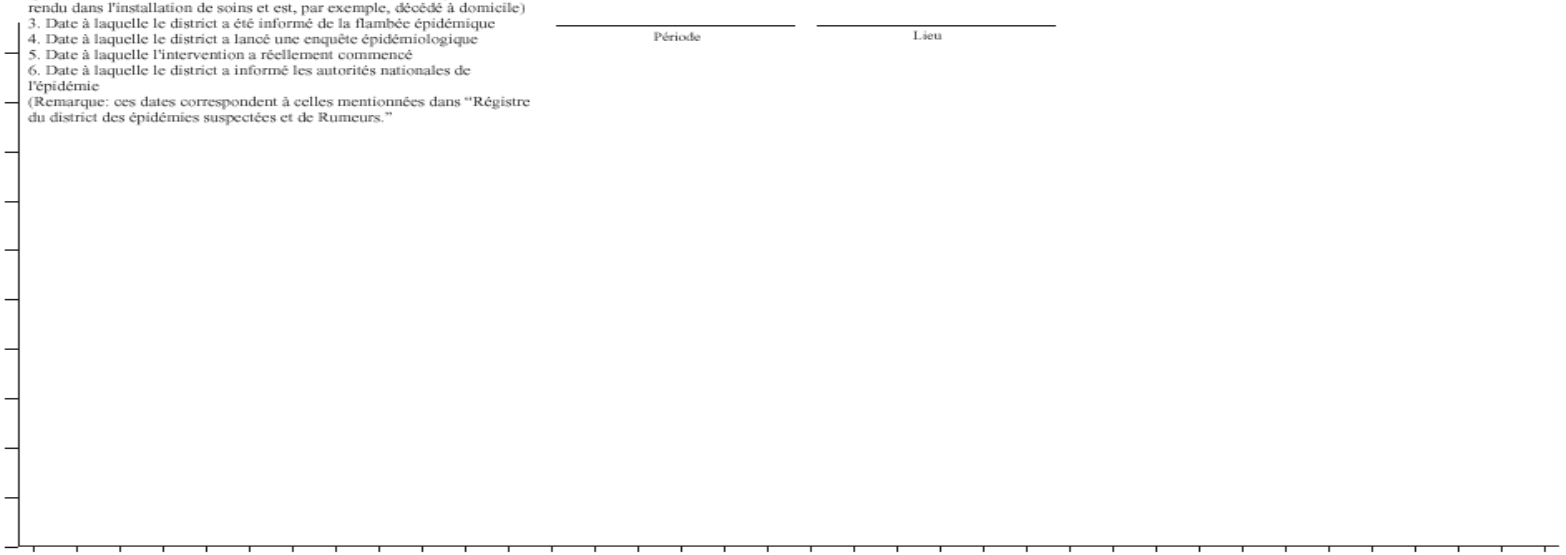
A l'aide de flèches et d'étiquettes datées, portez les éléments suivants sur la courbe:
1. Date probable du premier cas (décelé rétrospectivement à la suite d'une enquête épidémiologique menée par le district)
2. Date à laquelle le premier cas a été vu dans un établissement sanitaire (peut être différente de celle du cas initial si celui-ci ne s'est jamais rendu dans l'installation de soins et est, par exemple, décédé à domicile)
3. Date à laquelle le district a été informé de la flambée épidémique
4. Date à laquelle le district a lancé une enquête épidémiologique
5. Date à laquelle l'intervention a réellement commencé
6. Date à laquelle le district a informé les autorités nationales de l'épidémie

(Remarque: ces dates correspondent à celles mentionnées dans "Régistre du district des épidémies suspectées et de Rumeurs."

'Courbe épidémique' et analyse de la ponctualité de la détection et riposte pour une flambée épidémique possible

Période _____ Lieu _____

Vous pouvez utiliser des lignes ou symboles différents pour distinguer cas, décès, cas avec prélèvement, cas avec test positif, etc. Chaque tranche d'âge peut être représentée par un type de ligne ou un symbole différent.



Par jour, tous les 2 / 3 jours ou par semaine

Cas																																			
Décès																																		
Taux de létalité																																		

Interprétation: _____

APPENDIX 3.2: FORMATS FOR INDIVIDUAL TABLE ANALYSIS

Examples of analyses per individual characteristics presented below may be used for the epidemiological data or at the end of the year during the summary data analysis for surveillance reports based on cases.

Distribution According to age

Age Group	Number of Declared Cases	% of cases declared
0 – 4 years		
5 - 14 years		
15 years and older		
Sub-total		
Unknown age		
Total		

Distribution according to residence (Urban/rural example)

Residence	Number of reported cases living in that area	% of declared cases
Urban areas		
Rural areas		
Sub-total		
Unknown		
Total		

Distribution according to Sex

Sex	Number of cases notified	% of cases identified
Female		
Male		
Sub-total		
Unspecified		
Total		

Distribution according to the Hospital Status of the Patient

Source of declaration	Number of cases notified	% of notified cases
Hospitalised		
External consultation		
Sub-total		
Unspecified		
Total		

Distribution according to the Vaccination Status and its Evolution

Number of vaccine doses	Number of patients that have survived	Number of patients deceased
Zero		
1		
2 or more		
Sub-total		
Unknown		
Total		

SECTION 4: INVESTIGATE REPORTED OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

This section explains/ describes how to:

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

INVESTIGATE REPORTED OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

An investigation is aimed at identifying and evaluating people exposed to an infectious disease or affected by an unusual health problem.

The investigation provides important information for taking immediate actions to control the disease and improving long-term prevention activities. The procedure used for an epidemiological investigation of an outbreak due to an infectious disease can also be applied to other public health problems. The objectives of an investigation are as follows:

- To confirm an outbreak or a public health event
- To identify and treat additional cases that have not been reported or recognised;
- To collect information and laboratory specimens to confirm the diagnosis;
- To identify the epicentre and the source of the infection or the cause of the outbreak;
- To describe how the disease is transmitted and to define the populations at risk;
- To select appropriate response activities to control the outbreak;
- To strengthen prevention activities to prevent any recurrence of the epidemic;

In the present technical guide, epidemiological investigation are organised by the district hospital with the support of the central level.

DETERMINE WHEN IT IS APPROPRIATE TO INVESTIGATE A REPORTED OUTBREAK

For certain transmissible diseases only one suspected case may trigger an action, a report to a higher level and an investigation. Certain dangerous diseases may rapidly spread or result in high case fatality rates, if cases are not managed promptly. For other diseases, the triggering factor will be the time when a certain threshold is attained. When the threshold is reached, the

health personnel will quickly initiate an investigation and also manage cases. They will also be ready to initiate an adequate and large-scale public health response. Thresholds are described in Section 8. Certain health problems require that investigations are conducted within the shortest time possible. Districts conduct investigations of suspected outbreaks within 48 hours following a report on a possible outbreak. An investigation follows next circumstances:

- The District hospital receives a report of an outbreak of an immediately reportable disease;
- The observation of unusual increase in the number of cases and/or deaths during routine analysis of data;
- There is cluster of cases and/or deaths for that cause cannot be explained or is unusual.

  For example:
  - Death of an adult resulting from non-bloody diarrhoea;
  - The occurrence of unusual situations that risk being complicated by epidemics. (Natural disasters, movements of the population, etc).

OBSERVATIONS:

1. Thresholds do not vary according to the district or the health structure if they are about immediately reportable diseases because they are determined by national policies;
2. To establish thresholds that are used by the health facility to report other diseases with high potential epidemic to the district such as bloody-diarrhoea, non-bloody diarrhoea malaria, measles, or meningitis, it is necessary to discuss the following stages with the health facility personnel:

   a. If data on previous years are available, study the trends related to cases and deaths due to these diseases during the last 5 years.
   b. Determine a baseline number in order to describe the current extent of the disease in the catchment area.
3. Appropriately, take into account factors linked to diseases characterised by seasonal increases, such as malaria or cholera;

4. State clearly the threshold by specifying the number of cases per month or per week so that the personnel responsible for the surveillance in health facilities can easily recognise when the threshold is reached.
5. Periodically review the epidemic threshold and to adjust it according to past and present trends of the disease. If the disease burden changes (For example, following an increase of the number of cases), there is need to adjust the threshold.
6. Examples of thresholds for the implementation of interventions or investigation targeting cases or likely outbreak are shown in section 8 of this document.

RECORD REPORTED OUTBREAKS AND RUMOURS

Prepare a method that enables the recording reported outbreaks and rumours and response activities. Also, suspected outbreaks reported to the health facility or to central level and the response activities should also be recorded. A model form for recording reported outbreaks- "Register of epidemics and rumours "is presented in Appendix 4.1 of this section.

If the health facility uses an analysis register, this form may be incorporated in it. The objective for tracking reported epidemics is to ensure that the report of every suspected or rumoured epidemic is followed by measures and resolutions. These records will enable the evaluation of the timeliness and completeness of the outbreak investigation and the response process.

VERIFY THE REPORTED EPIDEMIC INFORMATION

It is necessary to promptly verify reports of outbreaks received from health facilities or the community. This confirmation or invalidation is important to ensure that timely decisions are made and to prevent unnecessary and wasteful allocation of resources investigation to investigate events that are not outbreaks. To verify a reported outbreak, consider the following factors.

- The Source of information (For example, is the source of the rumoured case of outbreak reliable? Does the report come from a health facility?)
- The gravity of the disease;
- The number of cases and deaths reported;
- The mode of transmission and the risk of propagation;
- Political and geographical considerations;

- Public relations;
- Available resources;
- Socio-economic situation;
- laboratory confirmation;
- Quality control;
- Pre-exposure factors (vulnerable group).

The nature of the outbreak, in view of the factors above, may lead the district to accelerate investigation. The report of suspected outbreak of viral haemorrhagic fever cases (VHF), for example, may be treated with more urgency than report of neonatal tetanus cases because the risk of wider propagation of VHF is greater. Regardless of the factors, suspicions of outbreaks (including immediately notifiable cases) must be declared by health facilities within 48 hours.

PREPARE TO CONDUCT AN INVESTIGATION

It is necessary to coordinate investigation objectives with the person in charge of the epidemiological surveillance or the person responsible for disease control at the district hospital level and to ensure that these objectives will enable the production of indispensable information necessary for the implementation of appropriate response activities. It will be necessary besides to plan the utilisation of methods adapted to the disease or the condition that is being investigated. If previous planning activities and response in the area of epidemiological surveillance have already been carried out in the district or in a health facility, the personnel capable to participate in the investigation should have been identified and trained already.

SPECIFY THE TASKS THAT ARE ASSIGNED TO THE HEALTH PERSONNEL

The health personnel should be informed of tasks that they are supposed to carry out and functions that they must support. It will be necessary to ensure that the team in charge of investigation clearly understands the relationship between investigation activities and the selection of response activities preventing the propagation of the disease.

DEFINE SUPERVISION AND COMMUNICATION PROCEDURES

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 health facility and other levels, including the local level. For example, define who will communicate with the

Ministry of Health, the media and the community. District elaborates 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, E-mail or conference calls. Show on the diagram the lines of authority and the roles of each staff person on the team. Develop an appropriate supervisory checklist for use in monitoring outbreak investigation activities.

DETERMINE WHERE THE INVESTIGATION WILL TAKE PLACE

1. Examine the information already known of the suspected disease, including its mode of transmission and risk factors. From these indications, define geographical limits and the target population of the investigation. begin research in the zone that is most affected;
2. Contact neighbouring health facilities to find out if they recorded similar cases or an increase of cases with similar diagnosis;

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.

DESIGN FORMS AND MODELS FOR THE COLLECTION OF DATA AND SAMPLES

The investigation team should review how to collect the required data and record it. For example, the personnel should at least be capable of collecting information and recording it on a line- list. Select the variables to identify record and analyse for the disease being investigated. Depending on the responsibility of the personnel, review how to identify and record the information for the preparation of the following tools:

- Line- list for the summarising time, place and person analysis;
- The epidemic curve(epi curve)
- Spot map
- Tables of analysis for risk factors, age group, sex, vaccination status, etc.

The procedure is described in Section 3.0.

MOBILISE MATERIALS AND EQUIPMENT FOR THE SAMPLES COLLECTION

The district hospital has a rapid intervention kit containing materials and facilities to be used by investigators. If this kit is not available in the district hospital, consult instructions formulated by the service in charge of the control of potentially epidemic disease at the

central level in the Ministry of Health and specialists from the National Reference Laboratory to determine the standards related to laboratory materials and equipment for the collection, conservation and transport of samples required. Refer to the table related to laboratories (Section 1.0) and specific instructions on diseases (Section 8).

CONFIRM THE DIAGNOSTICS

STUDY THE EPIDEMIOLOGICAL CONTEXT

Patient(s) will be examined to verify if signs or symptoms that they present correspond to the definition of cases. Questions such as the following will be posed to the patient or to a family member that can answer on his/her behalf:

- Where do you live?
- When did the symptoms appear?
- How have symptoms evolved?
- The notion on previous medication
- Are there other patients who present the same signs in your family (or at the place of work, in your Sector, in your Cell)?
- Have you recently travelled?
- Where have you lived in the last two weeks that preceded the onset of symptoms (Place of residence at the time of the disease);
- Did anyone visit you in the last two weeks?

SAMPLES COLLECT AND LABORATORY RESULTS

If the disease may be confirmed by laboratory tests, reference will be made to the table related to laboratories in Section 1.0 to determine the diagnosis and the sample required, and to collect samples if necessary. In this table the method for the collection, preservation and submission of samples is also indicated (by the appropriate person: laboratory assistant or nurse) and how many samples should be collected to confirm an epidemic for a particular disease. Results of laboratory examinations will be examined by the team in charge of investigations, clinicians and laboratory technicians in the health facility. Do results of tests tally with results of clinical examinations? If it is necessary to clarify certain points concerning laboratory results, the officer concerned may ask for additional assistance from programme coordinators or the technical experts at the national level.

CONDUCT AN IMMEDIATE RESPONSE

ISOLATE AND TREAT CASES AS NECESSARY

This involves strengthening case management in the health care facility (or at the places where patients are consulted) and providing advice, support and materials to the health facility, as indicated by case management guidelines related to the care of cases. To identify cases with high contamination risk and to isolate them. The following activities will especially be carried out:

- Monitor signs and symptoms of patients;
- Treat the patient with recommended drugs and therapies that are available;
- Provide support to the health facility by improving the control of diseases depending on the needs and the disease concerned. Standard precautions will be applied for all patients consulted in the health facility, especially during an epidemic of disease transmitted by contact with contaminated objects and body fluids.

SEARCH FOR OTHER ASSOCIATED SUSPECTED CASES

Once the initial cases have been confirmed and the treatment begun, actively search for additional cases. This involves the identification of cases that have been in contact with the confirmed cases and other cases with signs and symptoms of the disease in question.

SEARCH FOR CASES IN HEALTH FACILITY REGISTERS

In health facilities where cases have been reported, search for additional cases in registers. It is necessary to ask the personnel of neighbouring health facilities (including private health facilities) to search for similar cases in registers. Instructions on the examination of registers are presented in Appendix 4.2 at the end of this section. Patients that are allowed to return home will also be monitored.

SEARCH FOR SUSPECTED CASES IN THE COMMUNITY

Identify zones with high risk potential where patients lived, worked or travelled. Similarly, probe other sources of information in the community, especially from pharmacists or teachers, traditional healers and community health surveillance officers. The choice of zones where investigation will be carried out may depend on the disease, its mode of transmission and risk factors related to time, place person analysis. Visits will be organised in these places

and people who have had contacts, or likely to have had contacts with the patient will be investigated. Ask them if they themselves or one of their acquaintances have the disease or condition similar to the one that is the subject of current investigation. Try to know if any other person living in a zone close to the one where the patient resides was sick and presented signs or symptoms that meet the case definition. Collect information that will contribute to the description of the scale and the geographical extent of the outbreak. Transfer recently identified cases to the health facility for treatment.

RECORD INFORMATION ON OTHER ASSOCIATED CASES

For every new case discovered either in the register of the health facility or during search within the community that corresponds to the surveillance case definition. It will be necessary to record the collected information, using a case form, a line- list or other recommended forms.

RECORD INFORMATION ON A CASE REPORTING FORM

Record information on case-based reporting form of at least the first five patients as well as the information of those from whom, samples will have been collected. For every case, it is necessary to record at least the following information:

- The name and address of the patient,
- The sector or the cell where he/she lives and other locating information. If the patient does not have a specific address, the information will be recorded that enables contact with patient in case supplementary information would be necessary or to communicate to him/her the laboratory examination results and results of the investigation;
- Age and sex of the patient. This information will enable the description of the characteristics of the population affected by the disease;
- The date of onset of the symptoms and
- the date when the patient was consulted for the first time in the health facility;
- The information related to major risk factors, such as the vaccination status if the disease that is the subject of the investigation is preventable by immunisation;
- The name and the function of the person reporting the information.

OBSERVATIONS - To streamline data collection methods, it is recommended to use the case-based reporting form as slip for the submission of samples to the laboratory. (Refer to he model of the form presented in Appendix 2.3 of Section 2).Certain diseases have their own detailed forms for investigation of cases. A copy of these detailed forms for neonatal tetanus and acute flaccid paralysis are found in Appendices 2.2.b and 2.2.c of section 2. National instructions stipulate that detailed forms by case for tetanus neonatal and AFP may be filled by the health facility or by a member of the District hospital team when the report is addressed to the District hospital.

RECORD INFORMATION ON A LINE- LIST

When five to ten cases have been identified and the number of required samples has been collected, possible additional cases are recorded on a line- list. Use this list as a transmission form to the laboratory 10 or more cases need laboratory specimens collected on the same day and the submission will then be done in a batch.

ANALYSE EPIDEMIOLOGICAL OUTBREAK DATA

Methods of outbreak data analysis are similar to those recommended for the summarised data analysis in Section 3. Outbreak data are analysed and reanalysed several times in the course of the outbreak.

During initial analysis the epidemic situation will be summarised and indications of places with the highest prevalence and progress of the outbreak will be indicated as well as its source (single source, for example: deaths or funerals) and people at risk (for example, young children, refugees, rural population, etc.). Present data in the following manner:

- Draw a histogram representing the evolution of the disease (epidemic curve)
- Represent cases on a detailed map;
- Draw tables representing the major characteristics of cases (For instance, comparison between the age bracket and the immunisation status).

During an outbreak, these data must be frequently updated (often daily) to verify if the collected information changes the perception of cause of the outbreak and control measures.

ANALYSE DATA BY TIME

Prepare a histogram using data from the case reporting forms and line- lists. Plot cases on the histogram according to the date of the onset of the disease

An epidemic curve will progressively be traced and the geographical zone that the latter represents should be defined. For example, it should be decided if the curve must describe the entire district or only the catchment area of the health facility where the cases were identified. The results of the time analysis enables programme coordinators and officers responsible for the surveillance to carry out retrospective examination of the outbreak and to determine the time patients were exposed to the disease as well as the duration of the period of incubation. With the help of arrows, highlight important events represented on the histogram. Examine, for example, the log of reported outbreaks and rumours to identify the dates of the following events:

- Onset of the first case (or index case):
- Notification at the level of the District hospital by the health facility;
- Consultation of the first case in the facility health;
- Beginning of investigations of cases carried out at the level by the District hospital;
- Beginning of concrete response;
- District hospital notified national level.

Observation: This highlight with arrows enables the evaluation of timeliness of the detection, investigation and outbreak response. For instance, monitoring of the interval between the onset of the first known case and the time when this case was seen in the health facility is an indication of the knowledge of signs and symptoms of the disease within the community and the need to refer these cases to a health facility. These intervals are examined in more details in Section 7.0 *(To evaluate and improve the system).* Section 3.0 explains in more details the way to prepare and enter cases on a histogram. Section 7.0 describes the way of using the information contained in the histogram to control and to evaluate promptness of activities related to detection, investigation and response to cases that are presented.

ANALYSE DATA BY PLACE

The place of residence mentioned on case reporting form or the line- list should be represented on a map to describe:

- Cluster of cases that have been identified in a particular zone;
- Travel pattern linked to the mode of transmission of the disease concerned;
- Common sources of infection for cases concerned.

Reference will be made to Section 3 for additional information on the manner to prepare a location mapping of suspected and confirmed cases. Create a form of the region where likely or confirmed cases are presented by indicating the following elements:

- Roads, water supply sources, the specific location of communities and other elements may be linked to the risk of transmission of the disease subjected to the investigation. For example, a neonatal tetanus mapping will specify places of childbirth (trained traditional midwives and health facilities);

- Places where patients reside or major geographical features for the disease or condition (For instance per administrative sector, cell, workplace or refugee camp or, during the development the mapping representing patients affected by the meningitis epidemic, the location of the school that they attend);

- Other important cases of the disease that is the subject of the investigation. Refer to specific instructions on diseases for recommendations concerning the analysis of data according to location;

- What are places that are the most affected?

ANALYSE DATA BY PERSON

Examine forms specific to cases and line- list and compare variables concerning every suspected or confirmed cases for the disease or condition concerned. Depending on factors to be considered in the planning a specific response the total number and the proportion of suspected cases will for example be compared, and confirmed according to the following elements:

- Age or date of birth;
- Sex;
- Residence in urban or rural areas;
- Immunisation status;
- In-patient and out-patient consultations;

- Risk factors;
- Outcome of the disease: for example, the patient survived, died or his/her status is unknown;
- laboratory examination results;
- Final classification of cases;
- Other variables linked to the disease (deaths by age bracket, by sex);
- What are the most affected groups?

Use some information specific to diseases to determine what variable it is necessary to be compared. For example, if the collected data is about an outbreak of malaria, specify age groups targeted by the national malaria control Programme. Compare age groups of cases detected: young children (0 - 4 years), older children (5 - 14 years) and adults (15 years and older). Refer to specific instructions on diseases for recommendations concerning the comparison of essential variables for each disease. The procedure for the preparation of tables destined to individual analysis is described in details in Section 3.0.

INTERPRET RESULTS ANALYSIS

To interpret results of the analysis and formulate conclusions on the outbreak of an epidemic, for example:

- What was the source of the disease?
- What was the cause of the epidemic?
- What is the transmission mode
- What were measures taken to control the disease and with what result?

Interpret the results of analysis by time

Examine the histogram and observe the shape of the epidemic curve. Draw conclusions concerning the time of exposure to pathogen /agent, the source of disease and the incubation period.

- If the epidemic curve reveals an abrupt rising and then a declining movement, the exposure to the causal agent has probably lasted for a short time. It may happen that the source of disease was common;

- If the exposure to the common source occurred for a long period, the shape of the epidemic curve will probably have the form of a plateau;

- If the disease is the result of a person-to person transmission, the curve will be presented as a series of progressively taller peaks separated by incubation periods.

Interpret results of the analysis by place

The map will serve:

- In describing the geographical extent of the problem;
- In identifying and describing any cluster of transmission or exposure. (According to the agent that contributed to this epidemic, the proximity of cases will be specified in relation to possible sources of the disease).

Interpret results of the analysis by person

To plan the response to the epidemic, it is essential to have information linked to a personal analysis since this information describes with more precision, the population at risk for the disease or condition in question. For example, if cases of Measles have been detected among patients aged less than 15 years, the response in form of vaccination should target this age bracket.

CALCULATE CASE FATALITY RATES

Reference will be made to Section 3 for the method of calculation of case-fatality rates. In the following section we shall describe how to plan and to implement an efficient response by leaning from findings of the epidemiological investigation.

CONCLUSIONS DE L'INVESTIGATION ET RECOMMANDATIONS

Après avoir revu les résultats de l'analyse, formuler des conclusions et des recommandations par rapport à l'épidémie :

- Situation confirmée : il s'agit bien d'une épidémie ou d'un problème de santé publique
- Population affectée et à risque
- Causes possibles de l'épidémie ou du problème sanitaire, résultats de laboratoire, source de l'infection, mode de transmission, taux d'attaque, taux de létalité et facteurs de risque possibles
- Mesures déjà mises en place pour endiguer l'épidémie

- Recommandations :
  - Pour contrôler la situation
  - Investigations et études complémentaires à effectuer

COMMUNICATE OUTBEAK INVESTIGATION RESULTS

The DH rapid response team has to prepare immediately the outbreak investigation report. Detailed report should be prepared and disseminated immediately to concerned, including the HF where outbreak was declared.

EVALUATE RISKS AND DETERMINE FACTORS THAT EXPLAIN OCCURRING OF OUTBREAK OR HEALTH EVENT

The investigation team has to start as soon as possible evaluation of risk and respond to following questions:

- Did the health event have a severe impact on public health?
- Does the health event is unusual or unexpected?
- Are there significant risks of national spreading?
- Are there significant international trade or travel restrictions?

The national level should be invited to participate to evaluation of risk which will should allow to decide if the health event is susceptible to be an international health threat that justify its notification

APPENDICES FOR SECTION 4

Appendix 4.1: Register of epidemics and rumours at the health facility level

Appendix 4.2: Checklist for laboratory supplies used during outbreak investigations

Appendix 4.3: Recommended list of personal protective equipment (ppe)

Appendix 4.4: How to review hospital admission registers or outpatient consultation registers

Appendix 4.5: Generic line listing for reporting during outbreaks

Appendix 4.6: Contacts recording sheet

Appendix 4.7: Contact tracing form (follow-up)

APPENDIX 4.1: REGISTER OF EPIDEMICS AND RUMOURS

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

Condition or Disease or Event (1)	Number of cases initially reported (2)	Location (Health Centre, 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)	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 specific 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)

APPENDIX 4.2: CHECKLIST FOR LABORATORY SUPPLIES FOR OUTBREAK INVESTIGATIONS

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

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

For collecting laboratory specimens:

Blood

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

Blood films (malaria)

_____ Sterile or disposable lancet
_____ Glass slides and cover slips
_____ Slide box

Respiratory specimens

_____ Swabs
_____ Viral transport medium

Cerebral spinal fluid (CSF)

_____ Local anaesthetic
_____ Needle and syringe for anaesthetic
_____ Antiseptic skin disinfectant
_____ Sterile screw-top tubes and tube rack
_____ Microscope slides in a box
_____ Trans-Isolate transport medium
_____ Latex kit
_____ Gram stain
_____ May Grunwald Giemsa Kit

Stool

_____ Stool containers
_____ Rectal swabs
_____ Cary-Blair transport medium

Plague

_____ Gram stain kit
_____ Rapid diagnostic test (dipstix AgF1)
_____ Cary-Blair transport

If health facility has a centrifuge:

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

For packaging and transporting samples:

____ Cold box with frozen ice packs or vacuum flask
_____ Cotton wool for cushioning sample to avoid breakage
_____ Laboratoryels for addressing items to laboratory
_____ Laboratoryels for marking "store in a refrigerator" on outside of the shipping box
_____ Case forms and line lists to act as specimen transmittal form
_____ marking pen to mark tubes with patient's name and ID number (if assigned by the district)

Appropriate personal protection (PPE) (for all EPR diseases such as VHF, suspected avian influenza, etc.)

APPENDIX 4.3: RECOMMENDED LIST OF PERSONAL PROTECTIVE EQUIPMENT

The following equipment should be available for the personal protection of all staff investigating a suspected case of any viral hemorrhagic fever or avian influenza. The equipment should be held at Provincial level. See Annex 5A for other stocks that may be needed to respond to a suspected outbreak.

Composition of one set of PPE	**WHO Deployment Kit**
1 surgical gown	100 surgical gowns
1 coverall	100 coveralls
1 head cover	100 head cover
2 pairs of goggles	50 pair of goggles
1 pair of rubber gloves	100 pairs
1 mask N95	200 pieces
1 boot cover*	0
1 box 50 pairs of examination gloves	800 pairs of examination gloves
1 plastic apron re-usable	20 pieces
1 pair of gum boots	20 Gum boots
1 hand sprayer	2 of 1.5 litres each
1 Back sprayer	1 back sprayer of 10-12 litres
Specimen containers	
Scotch of tapes	3 rolls
Anti fog for goggles	3 bottles
Chlorine	
N.B: chlorine and gum boots can be purchased locally * Not essential	

APPENDIX 4.4: HOW TO REVIEW HOSPITAL ADMISSION REGISTERS

The objective of the examination of the register is to collect information on cases admitted in the health facility during a specific period. It is necessary to explain that information will help in determining the cause of an outbreak or the increase of the number of cases.

1. Select health facilities to be examined

According to local conditions and priority disease or conditions that are the subject of the investigation, select:

- Any in-patient consultation service that has more than ten beds, by giving the priority to public health facilities;
- Large referral or teaching hospitals with paediatric wards, that receive patients transferred by other Health facilities;
- Small hospitals or health facilities that serve remote areas and high risk categories of the population, for example, nomadic groups, regions with refugees without any regular care services.

2. Explain the objective of the examination to the health facility personnel

Explain to health officers of the health facility the objective of the feedback, to help the district hospital and the health facility to determine the most appropriate action; to check the epidemic and to prevent the emergence of new cases. Insist on the fact that this activity does not consist in the evaluation of the performance of health workers but to collect information.

3. Organise the operation.

To agree on a period during which the personnel that facilitates the examination will be present and available to provide their assistance to answer questions.

4. Identify sources of information

During the visit, depending on the priority disease or condition that is the subject of the investigation, verify hospital registers of paediatric units and infectious diseases. The hospital register of the paediatric service constitutes a good source because it includes the list of all children admitted in this unit. The annual summarised declarations are not always precise and registers of out-patients consultation services record provisional diagnoses only.

Review the system and procedures that are used by health workers to record information in diagnosis registers. This will ensure that data necessary for investigating likely cases is available. The register will at least include the following elements:

- The name and birth place of the patient;
- Signs and symptoms;
- The date of the onset of the symptoms and the evolution of the disease (For example, date of deaths ,if need be);
- The immunisation status, if it is applicable to the disease. If the health facility does not record minimal information, it will be necessary to study with health officers, the manner to strengthen the registration of data to be able to collect minimum information.

5. Consult registers on a determined day and hour

It is necessary to go to units selected at the agreed time. During the visit cases and deaths will be looked for in registers that are suspected to be attributable to neonatal tetanus. These cases and deaths should respond to the standard definition of cases for suspected cases. Then it will be determined if the place suspected that is subjected to investigation and has been declared in accordance with national instructions.

6. Post discovered suspected cases on a descriptive list

Record information on suspected cases; this information will be used during activities of the investigation of cases.

7. Give feedback to the health facility personnel

Examine results of the activity with the director and the supervisor of the health facility. By the same occasion, study all aspects of the care of cases affected by the disease concerned that could be of interest to health workers employed in the health facility. Emphasise the importance of immediate declaration and of the investigation of cases such as tools for the prevention of priority diseases and affections.

8. Declare any suspected case to the next level

Suspected cases will be reported in accordance with national procedures on the declaration of cases. It will be necessary to subject the case to more thorough investigation to determine factors that exposed the patient to the risk to contract the disease or affection. Initiate an appropriate case by case response.

APPENDIX 4.5: HEALTH FACILITY LINE-LISTING FORM

DH: _____ HC: _____ Date received at HF:……./……../20…….. Disease/Condition:_____

Province: _____District:_____Sector:_____Cell:_____

N° IDSR	Names	Patients (tick as appropriate)		Village or Town	Sex	Age[2]	Date seen at health facility	Date of onset of disease	Number of doses of vaccine (Exclude doses given within 14 days of onset)	Laboratory Tests			Outcome		Comments
		Out patient	In patient							Specimen taken (Yes/No) If yes, date collected		Laboratory results	A-Alive	D-Dead	
										Date	Type				

[2] *Age in years if more than 12 months, otherwise indicate number of months e.g. 4m, 7m.*

APPENDIX 4.6 CONTACTS RECORDING SHEET

Contact's Recording Sheet filled in by …….

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

Case's Village/neighborhood …… Chief or Community leader……

District/Town ……..….. Province …….

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

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

Contacts are defines as:

1 - Sleeping in the same household with a suspected or a case within 3 weeks

2 - Direct physical contacts with the case (dead or alive)

3 - Has touched his / her linens or body fluids

4 – Has eaten or touched a sick or dead anima

APPENDIX 4.7 CONTACT TRACING FORM (FOLLOW-UP)

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

Village ……. Chief or Community leader…..…….…..

District/Town ……..….. Province/Region …….……

CN	Name and Surname	Age	Sex	Date of last contact	Day of follow-up																					
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22

Record "O" if the contact has not developed fever or bleeding

Record "X" if the contact has died or developed fever and/or bleeding (complete Case Investigation Form and, if alive, refer to the hospital)

SECTION 5: RESPONSE TO EPIDEMICS OR OTHER PUBLIC HEALTH PROBLEMS

This section clarifies how:

- The national level and the District hospital, in collaboratoryoration with the administrative District, can improve preparedness to respond to epidemics and other public health problems;
- To choose appropriate public health response measures based on findings from epidemiological investigations including specific recommendations for diseases in order to :
  - Prepare an epidemic preparedness and response plan
  - Set up contingency stocks of drugs, vaccines, reagents and supplies
  - Carry out risk mapping for outbreaks and PH events
  - Consolidate the management of cases
  - Build capacity and competency of health personnel
  - Carry out emergency vaccinations

PREPARE TO RESPOND TO OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

This section presents steps to respond to:

- A confirmed public health emergency(for example, a confirmed outbreak of cholera);
- Trends detected during the course of analyzing routine data (for example persistent increase in the number of deaths of children under five (5) years of age due to ARI) indicating a stagnation or progression of number of cases or deaths due to a diseases targeted by a prevention program;

When there is an outbreak of a priority disease, the response must be immediate and all efforts and resources mobilized to contain the epidemic. If preparations were made in advance, the health system shall be capable of functioning efficiently and measures permitting the management and control of the epidemic and prevent avoidable deaths can be taken early enough.

If a problem is detected through a systematic data analysis, an appropriate response should be chosen and relevant measures taken. One will seek, for example, to improve the assessment and treatment of pneumonia cases in children below five years of age.

It is important for the national and district levels to coordinate the response measures. In the case of response to diseases of epidemic potential, it is the responsibility of the Epidemic management committees to plan interventions.
In situations where disease control objectives are not achieved as planned, corrective measures are taken by the authorities in charge of surveillance at the national level (RBC/TRAC-Plus).

Those in charge of institutions and health facilities responsible for the fight against endemo-epidemic diseases at all levels of the health system must in a systematic way do the following:

1. Analyze epidemiological surveillance data in order to investigate trends presenting a public health problem;
2. Ensure that medical personnel correctly utilize recommended protocols to manage cases due to priority diseases;
3. Verify and update necessary resources to respond to outbreaks of priority diseases by specifically verifying the following aspects:
    - Presence of qualified personnel;
    - Equipment, material and medical supplies for treatment of diseases;
    - Means of transport and communication;
    - Material for the collection and transportation of samples for confirmation of etiology;
    - Materials for administration of vaccines;
    - Procedures for the acquisition of vaccine stocks and rapid organization of vaccination campaigns in case of an emergency;
4. Regularly verify emergency stocks to ensure they are in good condition in terms of quality, are in sufficient quantities and ready for use;
5. Ensure that the relevant medical personnel know the procedures for obtaining laboratory confirmation(from sample draw to confirmation);
6. Hold periodic meetings of the Epidemic management committee whether or not there is an epidemic. If an epidemic breaks out, a meeting must be convened immediately. Such

meetings must also be held frequently or whenever necessary to plan, implement or monitor the epidemic response or simply to compile a report on these.

ESTABLISHMENT OF THE EPIDEMIC MANAGEMENT COMMITTEE

The management of an epidemic necessitates the putting together of all national resources and coordination of all actors. The Epidemic management committee should be established at: National, District and Sector levels. It is composed of technical and non-technical members from health and other sectors.

ROLE OF THE EPIDEMIC MANAGEMENT COMMITTEE (EMC)

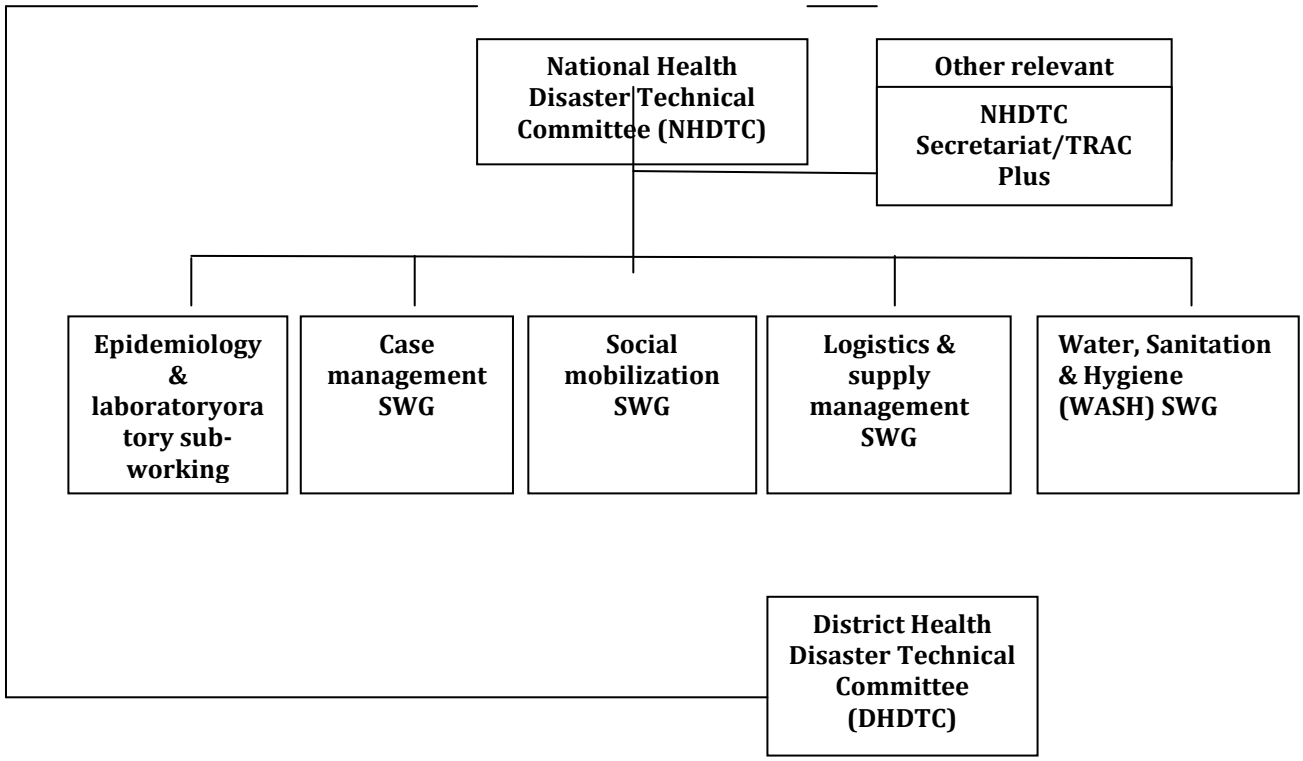
The role of the Epidemic Management committee is to develop and oversee the implementation of emergency preparedness strategies, action plans, and procedures**.**Its main functions are to:

- Coordinate activities to fight the epidemic ;
- Inform and sensitize the population on measures to fight the disease,
- Mobilize necessary resources to implement measures to fight the epidemic;
- Produce and disseminate reports on the fight against the epidemic;
- Ensure monitoring and evaluation is carried out.

Composition

The Committee is composed of the technical department at the level concerned which assumes secretarial work and is presided over by the politico-administrative authority at that level. Community representatives and development partners (donors) are members.

For example: the National Epidemic Management Committee is composed by the following persons from various institutions:



THE NATIONAL HEALTH DISASTER TECHNICAL COMMITTEE (NHDTC)

This body will be responsible for the overall coordination of all disaster management issues in the health sector and have relevant sub-working groups as indicated in the diagram above. Its terms of reference shall include:

1. Organizing and conducting joint field assessment during and after disasters
2. Identification and filling of critical gaps in health emergency response using the Who is doing What, Where and When (4W) matrix
3. Allocation of tasks and responsibilities to partners in terms of program and geographic areas based on their comparative advantage
4. Health disaster information management and dissemination
5. Mobilization of financial, human, logistic and other resources for emergency preparedness and response
6. Technical capacity building of members
7. Supervision, monitoring and evaluation of health emergency response activities

The day-to-day activity of the NHDTC shall be run by its secretariat which will be manned by appropriate MOH staff and membership of the committee shall include relevant MOH

staff, UN partners (WHO, UNICEF, UNFPA, UNHCR, WFP), NGOs (both national and international) and representatives from relevant sectors.

Terms of Reference of the Epidemiology and laboratory SWG

1. Rapid health assessments and epidemic outbreak investigation
2. Data collection, analysis and report writing
3. Development of surveillance protocols and general strengthening of surveillance systems
4. Case definitions
5. Collection, testing and dissemination of the result of relevant laboratory samples
6. laboratory strengthening

Terms of Reference of the Case Management SWG

1. Development of case management guidelines and protocols
2. Capacity building on case management
3. Support establishment of emergency treatment centres and health facilities
4. Support health staff recruitment and deployment during disasters

Terms of Reference of the Social Mobilization SWG

1. Development of health disaster communication strategy
2. Development and dissemination of Information, Education and Communication (IEC) materials
3. Support public awareness campaigns
4. Liaise with and provide relevant information to the media

Terms of Reference of the Logistic and Supply Management SWG

1. Inventory and management of all health emergency stocks available in the country
2. Procurement and distribution of stocks to the field
3. Support Information and Communication Technology (ICT)

Terms of Reference of the WASH SWG

1. Support water quality surveillance

2. Sourcing and distribution of water supplies materials such as water purification tablets, jerry cans etc
3. Monitoring of emergency water supply to disaster affected areas
4. Hygiene education in collaboration with the social mobilization SWG
5. Infection control, safe disposal of wastes and bodies

THE EPIDEMIC MANAGEMENT COMMITTEE AT THE DISTRICT LEVEL

Composition of the District Health Disaster Technical Committee (DHDTC)

- The Vice Mayor in charge of social affairs as President and focal point
- The District Executive Secretary, as vice president
- The Director of the most centrally placed district hospital as secretary (in districts with more than one hospital, the director of the hospital located in the epidemic zone may serve as secretary to the committee during the outbreak);
- The in Charge of community health workers at the district level
- A representative of the army
- A representative of the Police
- MINAGRI representative at the district level
- Director of the department of health : member;
- Supervisor in charge of surveillance : member;

THE EPIDEMIC MANAGEMENT COMMITTEE AT SECTOR LEVEL

Composition of Sector Health Disaster Technical Committee (SHDTC)

- Executive Secretary : President
- Secretary for Social affairs (SOC) : Vice- President and focal point
- The Executive secretaries of all cells (Members)
- In-charge of health center : Secretary
- In-charge of community health in the health center : member
- Police representative
- Army representative
- MINAGRI representative

ESTABLISH A DISTRICT HOSPITAL RAPID RESPONSE TEAM

A Rapid Response Team is a technical, multi disciplinary team that is readily available for quick mobilisation and deployment in case of emergencies.

MEMBERS OF THE DISTRICT EMERGENCY RAPID RESPONSE TEAM

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

- The Director of the district hospital
- The head of the DH laboratory
- A medical doctor chief of staff
- The In charge of M&E at the hospital
- IDSR focal point
- EPI supervisor
- Data manager or statistician
- Environmental health officer (or in charge of Public Hygiene)
- In charge of community health activities
- Others based on available of technical staff and specificity of the outbreak (such as experts in industrial poisoning or chemical events, for example).

Roles and responsibilities of the district rapid response team

The roles of the rapid district response team are to:

- Investigate rumours, reported outbreaks, and other public health emergencies
- Propose appropriate strategies and control measures including risk communication activities.
- Coordinate rapid response actions with partners and other agencies.
- Initiate the implementation of the proposed control measures including capacity building
- Prepare detailed investigation reports
- Contribute to the final evaluation of the outbreak response.

PREPARE AN EPIDEMIC PREPAREDNESS AND RESPONSE PLAN

The purpose of the plan is to strengthen the ability of the district to respond promptly when an acute outbreak or other public health event is detected.

This plan should:

- Be based on district risk assessments, and should specify the resources available for epidemic preparedness and response.
- Take into account diseases with epidemic potential in the district and in neighboring districts.
- Provide estimates of the population at risk for epidemic-prone diseases and other public health emergencies.
- Clearly indicate for each suspected outbreak which reference laboratory will be used for confirmation.
- Provide estimates of quantities of drugs, vaccines and supplies for each epidemic-prone disease likely to occur in the district.
- Be tested before implementation
- Include standard operating procedures (SOPS) in the training plan

Key sections of the epidemic preparedness and response plan should include:

1. Designated coordination committees
2. Epidemiology and surveillance including data management
3. Steps for carrying out a risk communication strategy including social mobilization
4. Operational actions according to expected phases of the epidemic
5. laboratory: specimen collection, handling , transportation and processing
6. Case management , Treatments (anti-viral, antimicrobial, decontamination, disinfection or others as indicated) & Infection control
7. Pre- and post-exposure prophylaxis treatment
8. Immunization strategies
9. Rapid containment activities and additional methods if rapid containment fails
10. Capacity building including required training, sensitization meetings and simulation
11. Logistics including supply lists
12. Environment, water and sanitation
13. Monitoring of the outbreak or event

Prepare for response

Assess the available resources and make necessary arrangements for the storage and transportation of materials and supplies to the affected area. Each level should be ready to undertake response activities.

Choose the mode by which to respond to the epidemic

When the epidemic is confirmed or if there is necessity for public health action, results from epidemiological investigation results and conclusions from data analysis must be reviewed and utilized to guide decisions.
See section 8 for specific response activities to diseases.

Plan response activities to the epidemic

See section 7.0 for response to the problems identified on the basis of analysis of summary monthly data. Consider the following possibilities when planning response activities:

1. If the emergency intervention requires funding, establish procedures for mobilization of the necessary funds,

2. If samples are collected in a remote place, put in place dispatch procedures and ensure there are facilities for:

   - Conservation of samples at the recommended temperature;
   - Rapid dispatch of the samples to the laboratory

3. Identify zones where the population is at high risk for the disease. Review the findings from data analysis in order to have a clearer description of the epidemiological characteristics. The intention is to find out:

   - The incidence rate of the disease;
   - The magnitude of risk factors for this disease by analyzing, for example, investigation results of the case to gather the following information:
     - ✓ Safe delivery practices in the case of neo-natal tetanus ,
     - ✓ Risky eating habits in case of diarrhea etc.
     - ✓ Number of persons carrying out activities within forests and hence at risk of yellow fever.
   - Rate of vaccination coverage for the epidemic disease in question.

4. Inform neighboring Districts about the epidemic. If they have a similar problem, coordinate efforts to combat it especially to:
   - Mobilize necessary resources;
   - Prepare appropriate educational health messages and materials;

- Carry out emergency vaccination campaign ;
- Send samples to the National Reference laboratory for confirmatory tests.

5. Check the list of necessary resources established by the Commission to fight endemic-epidemics. Obtain emergency materials and supplies and stock them at local level and at the District hospital.

   If materials, drugs and necessary supplies are not available locally:

   - Contact higher authorities to obtain information on where they can be obtained rapidly;
   - Solicit support from other departments, programs and activities or from non-governmental organizations in the region ;
   - Identify low cost substitutes ;

6. Assign clearly defined responsibilities to individuals in the departments to carry out specific response activities;
7. Train health personnel and provide them with materials, drugs and other medical supplies to enable them to:
   - Establish a detailed report of the response activities, taking into account, for example, a check list of vaccinated individuals and a list indicating community educational messages, communication channels, dates of community educational activities, persons having mosquito nets etc;
   - Analyze data related to the outbreak throughout the response period, from data on laboratory confirmation through treatment;
   - Identify problems related to the implementation of activities, and modify them if necessary.

Implement response activities

In the case of recommended response activities, refer to specific guidelines on the disease in question. The following are some of the response interventions:

- Strengthen case management;
- Update the skills and competences of medical personnel;
- Carry out emergency vaccination campaign;
- Reinforce surveillance during the response period;
- Carry out community information and educational activities;
- Improve access to clean, drinking water;

- Improve human waste disposal practices;
- Improve hygiene practices;
- Reduce exposure to risk factors;
- Control vectors;
- Disseminate technical guidelines on the response to the epidemic.

Strengthen case management

Take measures to support the adoption of improved clinical practices, especially:

- By verifying, in collaboration with the health facility, if the clinical personnel understand and utilize recommended protocols to handle cases due to the epidemic diseases ;
- Ensuring that clinical staff obtain laboratory confirmation of the epidemic disease in case the disease can be so confirmed;
- During a major outbreak, ask the in-charge of each health facility to identify a place which can be used to handle a high number of patients ;
- Provide and avail the necessary medications.

Update skills and competences of the health personnel

1. Provide health staff with concise and clear guidelines;

2. Choose themes for refresher training of health staff. Emphasize the management of the target disease in conformity with specific disease recommendations. Depending on the risk of transmission of the disease concerned, other themes can be added in particularly the following :
   - Reinforcement of the universal precautions (clean water, hand washing and the safe disposal of needles) ;
   - Sterilization and utilization of protective clothing ;
   - Isolation measures;
   - Treatment protocols such as administration of oral rehydration salt (ORS) and utilization of intravenous fluids ;
   - Disinfection of work station surfaces, clothing and equipment ;
   - Safe handling of dead bodies;
   - Safe funerals practices.

3. Conduct training sessions: In emergency situations, there is generally not enough time to organize conventional training. Therefore, it is on-the-job-training or individual training which is usually provided, depending on the needs and circumstances. For example, a qualified clinician may be requested to carry out individual demonstration within the health department. Ensure that the Doctor or nurse who conducts the training has the time to observe the trainees putting into practice the acquired skills.

Carry out emergency vaccination

If necessary, an emergency vaccination campaign shall be carried out by the district hospital in collaboration with the national Expanded Program on Immunization (EPI). Start planning this activity as soon as possible since time is required to obtain and distribute the vaccines. Establish in advance, an acquisition plan for emergency vaccines.

1. Determine the population targeted by this activity on the basis of results from investigation carried out on the epidemic outbreak ;
2. Consult the EPI program guidelines for specific recommendations concerning the administration of the concerned vaccine.

See Annexes 5.3 ‘‘Plan an emergency vaccination campaign” and 5.4 3 “Evaluate vaccine stocks for vaccination activities.”

Strengthen surveillance during response activities.

During the outbreak, mobilize all health personnel in all health facilities to be vigilant and ensure effective surveillance of the disease and ensure that they:

- Look out for other persons who might have contracted the disease and send them to health centers for treatment (in the case of cholera, for example) or place the family in a quarantine (notably in the case of plague) and treat the patient in question ;
- Update the line listing describing the cases and monitor the effectiveness of the epidemic response.

Inform and educate the community

Keep the public informed to calm fears and encourage cooperation with persons in charge of the epidemic response.

It is also imperative to prepare educational messages to provide the population with information related to symptoms of the disease, preventive methods to minimize its transmission and when to seek treatment. Communication activities with the community should be undertaken from the time the public health problem has been identified.

1. Determine what should be communicated and make reference to the disease specific guidelines appearing in section 8. Make sure you include the following information:
    i. Signs and symptoms of disease ;
    ii. How to treat the disease at home if treatment at home is recommended ;
    iii. Applicable behavior which can prevent transmission of the disease ;
    iv. Appropriate time for seeking care from a health facility;
2. Recommendations for vaccination if indicated.

   Determine how to formulate the message; the message must have the following characteristics:
    i. Utilise local terminologies ;
    ii. Be clear and concise;
    iii. Be culturally appropriate;
    iv. Take into consideration beliefs associated with the disease.

Annex 5.6, contains examples of messages that can be used to educate the community.

3. Choose appropriate means of communication available in the District. For example:
    - Radio
    - Television
    - Newspapers
    - Meetings with health personnel, community, religious and political leaders
    - Posters
    - Flyers
    - Internet
    - SMS
    - Presentations in market places, health centers, schools, women associations and other community associations, churches and mosques.
4. Disseminate health education messages to community groups and organizations and request them to disseminate the messages during their meetings.

5. Disseminate health education messages to opinion leaders and request them to disseminate them within the community.
6. Hold regular meetings with the community to give them:
    - Frequent and update information on the epidemic and response activities ;
    - Clear and simple health messages which the media can utilize;

Improve access to clean, drinking water

Ensure the community has access to sufficient quantity of clean, drinking water for their daily needs. The table below presents daily water needs per person in non-epidemic situations and during epidemic situations. Large quantities of water are required especially during an outbreak of diarrheal diseases.

Table 6: Daily water needs per person

Daily water requirements per person*		
	During non- epidemic period	**During an outbreak of diarrheal disease**
Home	20 litres per day	50 litres per day
In health facility	40 to 60 litres per day	50 litres in an admission ward ; 100 litres in surgery room ; 10 litres in the kitchen

*Source: *Refugee Health: an approach to emergency situations, Doctors without Borders, 1997. MacMillan*

The following are the common sources of drinking water:

- Chlorinated tap water;
- Open sources of water (river, swamp or open well).
- Protected water sources (for example : closed underground well with a cover) ;
- Boiled water from reliable trusted source.

If during an epidemic no source of safe drinking water is locally available, water tankers can supply water although this method is expensive and difficult to sustain. To ascertain that families have clean, drinking water at home, provide:

- Community education on how to keep drinking water safe at home ;

- Containers which prevent water contamination particularly containers with narrow opening through which it is impossible to introduce a hand ;
- Long distance (at least 30 meters between the latrines and water source.

Ensure proper and safe disposal of human waste

To ensure proper disposal of human waste, it is important to:

- Assign an inspection team to certain locations to check the safety of existing waste disposal practices : use of latrines or burying waste in a distance of at least 30 meters from the water sources ;
- Inform the community that the human waste disposal practices they use entail health risks and persuade them to construct appropriate latrines..
- Conduct community sensitization and education on public hygiene

Improve food hygiene practices

Ensure that in homes, restaurants, public markets and factories; food is handled in conformity with hygiene regulations. (Refer to the national norms and procedures for food handling and processing). To ensure proper food hygiene, it is imperative to undertake the following measures:

- Organize community education sessions on proper food hygiene practices targeting the general public and actors in the food industry ;
- Inspect restaurants, food hawkers, packaging industries, etc. in order to assess food handling practices, paying particular attention to their safety particularly hand washing cleanliness and respect of the national norms ;
- Close restaurants, public markets or factories if the inspection reveals that food handling practices present risk to the public ;
- If necessary strengthen national inspection teams.

Reduce exposure to mosquitoes

Encourage the prevention of diseases transmitted by mosquitoes by assisting the inhabitants of your district to reduce exposure to these insects during the day and night. Collaborate with the malaria control program to fight malaria to:

- Implement a program aimed at promoting the utilization of insecticide treated mosquito nets ;

- Organize a community educational program on proper use of mosquito nets and how to avoid mosquito bites at night.

Vector control

Encourage prevention of diseases transmitted by rodents by assisting the population of your district to reduce the possibility of exposure to these animals which might have contracted Lassa fever or be infested with fleas carrying plague. It is necessary to work with the District hygiene officer and HF to encourage the community to:

- Avoid all contact with blood or saliva of dead rodents ;
- Cover food and water kept at home such that rodents are not able to access them ;
- Keep the house and kitchen clean and clear to avoid rodent's infestation.

Prepare a report on the outbreak

A detailed report on the epidemic can help to make the necessary arrangements to counter the next outbreak. Once the epidemic has been brought under control prepare a report which should contain the following elements:

- Detailed information on response activities especially the dates, places and participants for each activity ; The District epidemiological report destined to high authorities comprises a report text , an epidemiological curve, detailed charts, tables of individual analyses and a line listing describing the cases;
- Changes which were eventually made on the initial response activities ;
- Recommendations to improve future response to epidemics. Suggest for example, modifying the vaccination strategy and program in order to strengthen the effectiveness of this activity. One can also propose to improve the procedures for dispatching samples so that they arrive at the National Reference laboratory in good state and more rapidly;
- Disseminate the report on the epidemic.

SET UP CONTINGENCY STOCKS OF DRUGS, VACCINES, REAGENTS AND SUPPLIES

Outbreaks and other public health emergencies require the rapid mobilization of resources such as vaccines, medicines and laboratory supplies. It is prudent to establish and preposition stockpiles of materials before an emergency occurs.

As follow up to the public health risk assessment activity, districts should set up a contingency stock of drugs, vaccines, reagents and supplies to permit prompt management of

the first cases without delay before support arrives from higher levels. Also regularly and carefully monitor the contingency stock in order to avoid shortages and expiry of drugs, vaccines, reagents and supplies. Examples of stock management tools are included in the annexes at the end of this section.

The content of the contingency stock varies with the nature of epidemic-prone diseases and the risk of outbreak in the district. Risk assessment activities help to develop a list of materials that should be stockpiled at the district and community levels. A suggested list of contingency drugs and supplies is available in Annex 5A at the end of this section.

Conduct stock management for outbreak response

Maintain a reliable supply of supplies and materials for responding to an outbreak or public health event.

Use an inventory checklist such as the one in Annex 5B to assess which supplies are already available for use during a response activity. If the supplies are already available, determine if they can be set aside for use during a response. If they are not available, can they purchased or requested through the national system for procurement?

Periodically, for example, every 4 months, make sure the supplies are dry, clean, and ready to be used.

At a minimum, carry out the following tasks (relevant to each level) to estimate necessary supplies, inventory what is available, and plan to procure essential items for use in response.

1. List all required items for carrying out surveillance, laboratory and response necessary for detecting and responding to priority diseases, conditions and events. Consider:
    a. Forms
    b. laboratory reagents and supplies
    c. Case management and field intervention materials
2. Make an inventory and note the quantity of each item that is available.
3. Complete and regularly update a stock balance sheet for each item.
4. Observe expiry dates and practice best logistical practices for packing, shipping, storing and disposing of supplies and materials.

5. Establish a critical or minimum quantity for each item that would need to be on hand for an investigation or response activity. Consider logistic and epidemiologic factors in establish minimum quantities.
6. Monitor the stock balances against the critical quantity established.
7. Report regularly on the IDSR stock situation. See Annex 5C for an example of a stock item transaction and balance sheet.

RISK MAPPING FOR OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

Preparedness activities should be ongoing and updated periodically. This includes assessing risks (in the catchment area) with the potential to affect community health. These risk assessment activities may include evaluating drinking water sources or food storage methods. Regularly, once a year, for example, assess those risks and record the information on a map. This is useful information when considering supplies, transport and other resource issues necessary for the response.

Risk mapping should extend to all public health hazards as specific by IHR (2005) including chemical, zoonotic, radiological and nuclear.

APPENDICES FOR SECTION 5

APPENDIX 5.1: TREATMENT OF CASES IN AN EMERGENCY SITUATION

Utilize drugs and appropriate treatment to manage cases during an epidemic. The following are recommended treatments for cholera, dysentery, measles, and bacterial meningitis during epidemics.

Treatment of cholera in an epidemic situation

Source: *WHO guidelines for management of the patient with cholera, WHO/CDD/SER/91.15*

1. Evaluate the extent of dehydration of the patient (see evaluation guide below);
2. Administer fluids in conformity with treatment plan (see the following page);
3. Collect a sample of stool from the first five suspected patients examined in the health centre ;
4. Administer oral antibiotics to patients who present severe dehydration.

<table>
<tr><td colspan="3">Evaluate the extent of dehydration of the patient</td></tr>
<tr><td colspan="3">➢ Evaluate the general condition of the patient:
- Lethargic or unconscious
- Agitated and irritable?
➢ Does he/she have sunken eyes?
- Give patient fluids. Is the patient unable to drink drinks badly; Drink rapidly, is he thirsty?
➢ Pinch the skin of the abdomen. Does it return into position?
- Very slowly (more than 2 seconds}
- Slowly?</td></tr>
<tr><td colspan="3">Decide if the patient is dehydrated : severely, lightly or not at all and then administer fluids according to the treatment plan</td></tr>
<tr><td colspan="2">If two of the following signs are present:
➢ Lethargic or unconscious
➢ Sunken eyes
➢ Does not drink or drinks badly
➢ Pinched skin returns into position very slowly</td><td>SEVERE DEHYDRATION
Give fluids in the case of severe dehydration (Plan C)</td></tr>
<tr><td colspan="2">If two of the following signs are present:
➢ Agitated and irritable
➢ Sunken eyes
➢ Drinks rapidly, is thirsty
➢ Pinched skin returns into position slowly</td><td>LIGHT DEHYDRATION
Give fluids in the case of light dehydration (Plan B)</td></tr>
<tr><td colspan="2">If there are not enough signs to classify as severe or light dehydration</td><td>NO DEHYDRATION
Give fluids and food and treat the diarrhea at home (Plan A)</td></tr>
<tr><td colspan="3">*For adults and children over the age of 5 years, other signs of severe dehydration include « absence of radial pulse and hypotension”.</td></tr>
<tr><td colspan="3">Administer recommended antibiotics to treat cholera patients who are severely dehydrated.</td></tr>
<tr><td>Antibiotics</td><td>Children</td><td>Adults</td></tr>
</table>

Doxycycline single dose	–	300 mg[1]
Tetracycline 4 times daily for 3 days	12.5 mg per kg	500 mg
Trimethoprim-sulphamethoxazole (TMP-SMX) 2 times daily for 3 days	TMP 5 mg per kg and SMX 25 mg per kg[3]	TMP 160 mg and SMX 800 mg
Furazolidon 4 times daily for 3 days	1.25 mg per kg	100 mg[4]
Erythromycin [3] ➢ Adults : 4 times daily for 3 days ➢ Children: 3 times daily for 3 days	10 mg per kg	250 mg

- If the patient vomits on drinking the fluid, wait for 10 minutes. give the patient more solution to complete the dose but more slowly this time;
- Continue to monitor the patient and replace fluids until the diarrhea stops;
- When the patient is ready to be discharged from hospital, explain to him/her how to take the mange diarrhea at home;
- Use the technical guidelines on IMCI as reference to treat children below the age of 5 years and the national guidelines for the management of diarrheal disease for more information on the treatment of acute watery diarrhea and confirmed cholera.

Plan A: Management of diarrhea at home

If the patient does not show any sign of dehydration after examination, he/she can be treated at home. Give him/her enough oral rehydration solutions (ORS) for two days and explain how to take ORS solution by following the guidelines below:

AGE	**Quantity of solution following each watery stool**	**Give enough ORS to prepare:**

[1]Doxycylcine is the antibiotic of first chosen recommended by the WHO for adults (except for pregnant women) as it is a single dose.
[2]TMP-SMX is the antibiotic of first chosen recommended by the WHO by the WHO for children Tetracycline is also efficient but is not recommended for use in pediatric patients.
[3]Furazolidon is the antibiotic recommend by WHO for pregnant women [4]Erythromycine or chloramphenicol can be used if other recommended antibiotics are not avai laboratory, or if *V. cholerae* is resistant to certain antibiotics.

Up to 2 years old	50 - 100 ml	500 ml per day
From 2 - 10 years old	100- 200 ml	1000 ml per day
Over 10 years old	As much as the patient desires	2000 ml per day

Plan B: Management of light dehydration with ORS

In the clinic, give the recommended dose of ORS over a four hour period. . Determine the quantity in relation to the weight of the patient. Utilize the age of the patient only when the weight is unknown.

Determine the quantity of ORS to administer during the first 4 hours						
Age or Weight	**Up to 4 months**	**From 4-12 months**	**From 12 months to 2 years**	**From 2 - 5 years**	**From 5 -14 years**	**Over 14 years**
Weigh in kg	< 6 kg	6 - < 10 kg	10 - < 12 kg	12 - < 19 kg	19 - 30 kg	30 kg or more
Quantity of ORS in ml	200 – 400	400 - 700	700- 900	900 – 1400	1400 - 2200	2200 – 4000

- If the patient desires more ORS than recommended, give it to him/her ;
- In case of children under the age of six months, who are not breastfeeding, give them
- between 100-200ml more of clean water during this period ;
- Give small but frequent sips of ORS;
- If the patient vomits after drinking the fluid, wait for 10 minutes then resume giving the patient the fluid but more slowly this time, until he/she finishes it;
- For breastfeeding children breastfeed them whenever they so wish ;
- Evaluate the patients every 1-2 hours to ensure that they take the ORS dose as prescribed and monitor loss of fluids. Re-evaluate completely the level of dehydration of the patient after 4 hours and monitor the treatment plan corresponding to the patient's level of dehydration.

Plan C: Rapidly treat severe dehydration

1. Start by giving intravenous fluids immediately. If the patient is a child who drinks little fluids, administer ORS through the mouth as you prepare the intravenous route. Give 100 ml per kg of linger lactate solution divided as indicated below:

Administer IV fluids:		
For adults (elderly patients and children over 1 year old) give 100ml per kg IV in 3 hours as indicated:	Give 30ml per kg as quickly as possible in 30 minutes	Then give 70ml per kg during the next two and half hours
For patients under year old: Give 100ml per kg IV in 6 hours as indicated	Give 30ml per kg within the first hour*	Then give 70ml per kg during the next five hours

*Repeat once if the radial pulse is still very weak or is not detectable even after the first dose of 30 ml per kg was administered.

2. Re-evaluate the patient after the first 30ml per kg and then every 1 to 2 hours. If dehydration does not improve increase the rate of intravenous rehydration;
3. Also give ORS (about 5ml per kg per hour) as soon as the patient is able to drink after 3-4 hours for children and after 1-2 hours for patients who are more than one year old;
4. Re-evaluate the patient after 6 hours (for young children) or 3 hours (if the patient is one year old or older). Evaluate the dehydration level then choose the appropriate plan (plan A, Plan B, Plan C) to continue the treatment;
5. Give recommended antibiotics for treatment of severe dehydration in patients suffering from cholera; (see the guidelines on the following page);
6. Give the patient information on the management of diarrhea at home before he/she leaves hospital.
   - In case the patient is vomiting after taking in RSO, wait for 10 minutes. Then re-administer the dose until it is finished but more slowly this time;
   - Continue breast-feeding in the case of young children;
   - Return for treatment in the case the following symptoms appear:
     - Increase in frequency of liquid stools;
     - Poor feeding and drinking;
     - Severe thirst;

- Repeated Vomiting

	NALIDIXIC ACID Four times daily for 5 days	**CIPROFLOXACIN** Two times daily for 5 days	**CITRIMOXAZOLE** (Trimethoprim + sulphamethoxazole) Twice a day for 5 days		
Weight in kg	**TABLET** 250 mg	**TABLET** 250 mg	**TABLET ADULT** 80 mg trimethoprim + 400 mg **sulphamethoxaz**	**TABLET CHILD** 20 mg trimethoprim + 100 mg **sulphamethoxa**	**SIRUP** 40 mg trimethoprim + 200 mg sulphamethoxazole per
Dose for children					
3 - 5 kg	*¼*	*¼*	*¼*	*2*	*5.0 ml*
6 - 9 kg	*½*	*½*	*½*	*2*	*5.0 ml*
10 -14 kg	*1*	*1*	1	3	7.5 ml
15 -19 kg	*1*	*1*	1	3	7.5 ml
20-29 kg	2	2	1	6	15 ml
Dose for Adult	**Tablet** 250 mg	**Tablet** 250 mg	**Tablet** 160 mg TMP + 800 mg SMX		
	4 **Tablets**	4 **Tablets**	2 **Tablets**		

- Fever;
- Blood in stool.

Give appropriate oral antibiotics for bloody diarrhea caused by Shigella dysenterial type I

Source: *WHO Guidelines for the control of epidemics due to S. dysentery type 1, 1995*

Give vitamin A to children who have measles

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

- Give the first dose at the health centre or clinic ;
- Give the next dose to mother who will administer it to the child the next day.

AGE	**Vitamine A Capsules**

	200 000 IU	100 000 IU	50 000 IU
Up to 6 months		½ capsule	1 capsule
6 to 12 months	½ capsule	1 capsule	2 capsules
12 months to 5 years	1 capsule	2 capsules	4 capsules

Give appropriate antibiotic for bacterial meningitis during the epidemic outbreak

Source: Control of epidemic-prone meningococcal disease, WHO practical guidelines, 2nd edition 1998, WHO/EMC/BAC/98.3

1. Admit the patient at the health centre for diagnosis and treatment.

2. Start antibiotic treatment immediately. Oily chloramphenicol by intramuscular injection is the treatment of choice during the epidemic. It is very effective and a single dose is sufficient most of the time. If injectable Oily chloramphenicol is not available, give oral amoxicillin or cotrimoxazole. Better still treat with an antibiotic recommended by the national technical guidelines for the treatment of meningitis.

3. Isolation of the patient is not necessary. Provide the necessary care and support.

4. Give a single dose of chloramphenicol

AGE	**Intramuscular oily chloramphenicol 100 mg per kg, single dose**	
	Dose in grammes	Dose milliliters
Adult: At least 15 years	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

NB: See below for other recommended antibiotics

Other recommended antibiotics for the treatment of meningitis

Drug	Route	Dose for adults	Dose for children	Treatment period
Penicillin G	IV	3-4 MU every 4-6 hours	400 000 Units per kg	4 days
Ampicillin plus Chlaramphenico	IV	2-3 g every 6 hours,	200mg/kg/24hours in 4 divided doses(6 hourly)	10-14 days
Chloramphenicol	IV	1g every 8-12 hours	100 mg/kg/24Hours in 4 divided doses (6hourly)	10-14 days
Chloramphénicol (oily)	IM	3 g single dose daily	One single dose - 100 mg per kg	1-2 days
Cefotaxime	IV	2g every 6 hours	200mg/kg/24 hours divided into 3 doses(8 hours) 250 mg per kg	4 -14 days
Ceftriaxone	IV	1-2 g during 12-24 hours	50-80 mg /kg/24 hours as a single daily dose	4 -14 days
Ceftriaxone	IM	1-2 g single dose	50-80 mg per kg	1-2 days

If Convulsions: Diazepam, slow IV, 0.25–1 mg/kg (maximum 10 mg) to control seizures. Titrate dose according to response.

Maintenance therapy: Phenobarbital, oral, 5–10 mg/kg/24 hours in 2 divided doses, until patient is free of convulsions for 14 days.

Taper dosage of anticonvulsant over 1 week before withdrawal

APPENDIX 5.2: PREPARE DISINFECTANT SOLUTION

In the framework of response to diseased transmissible by direct contact with infected body fluids (ex : blood, urine, stool, sperms, expectoration), an affordable system based on ordinary household disinfectant can be provided. In the table below, we explain how to prepare chlorinated solutions of 1:10 and 1:100 parts from ordinary household disinfectant and other chlorine products.

0	**To prepare a 1 :10 solution to disinfect :** *- excretions* *- Dead bodies* *- infectious body liquids*	**To prepare a 1 :100 solution to disinfect :** *- Gloves* *- Hands and bare skin* *- Floors* *- Clothing* *- Equipment* *- Beddings*
House hold disinfectant containing 5% active chlorine	1 liter of disinfectant in 10 liters of water	100 ml of disinfectant in 10 liters of water or 1 liter of 1:10 disinfectant solution in 9 liters of water
70% (HTH) calcium hypochlorite Powder or granules	7gm or ½ tablespoon in 1 liter of water	7 gm or ½ a tablespoon in 10 liters of water
Household disinfectant containing 30% active chlorine	16 grams or 1 tablespoon in 1 liter of water	16 grams or 1 tablespoon in 10 liters of water

To disinfect clothing and other personal belongings:

- Rapidly and thoroughly disinfect patients personal belongings and his/her immediate surroundings using one of the following disinfectants:
  - Chlorinated lime powder ;
  - 1% chlorine solution
  - 1-2% phenol solution;
  - Wash utensils with hot water or disinfectant solution.
- Rapidly and thoroughly disinfect the patient's clothing:

- Wash clothing with soap and water;
- Boil or soak in disinfectant solution;
- Allow to dry in the sun;
- Don't wash contaminated objects in rivers or swamp used as source of drinking water

APPENDIX 5.3: PLAN AN EMERGENCY VACCINATION CAMPAIGN

1. Specify the target population for the immunization activity
2. Estimate the necessary amounts of vaccine, diluents, and immunization supplies such as sterile syringes and sterile needles, cold boxes and safety boxes
3. Choose the immunization sites and inform the community.
    - Coordinate with the EPI or disease control program in your district to identify sites for conducting the immunization activity.
    - Identify the facilities that can participate in the activity
    - Determine if some areas are not accessible and identify a mobile immunization team, if needed.
    - Contact the facilities and schedule the immunization sites.
    - Contact the national level to request vaccine.
    - Make sure there is enough capacity to store extra amounts of the vaccine during storage and transportation to the immunization site.
4. Select immunization teams. For every 100 to 150 people expected at the immunization site, the followed staff is required:
    - One to two vaccinators to give immunizations
    - One recorder to record on immunization cards
    - Volunteers to verify age and immunization status.
5. Work with your EPI team to conduct refresher training for vaccinators on recommended immunization practices.
6. Mobilize the community. Inform the public about the emergency immunization activity.
7. Arrange staff 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 doses of vaccine given.

APPENDIX 5.4: ASSESSING VACCINE STOCKS FOR VACCINATION 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 0 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 wastage* *Number of recommended doses to order including wastage*
4. Allow for a reserve stock. Use a reserve factor of 25%. Multiply the estimated number of doses including wastage times 1.25 to obtain the total estimated number of doses.

   _____ x 1.25 = _____

   Number of doses *Reserve factor* *Total number of estimated doses including wastage*

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 laboratory and may be one dose, two doses, five doses, ten doses or twenty doses).

_____	÷	_____	=	_____
Total number of estimated doses		*Doses per vial*		*Total number of vials required*

6. If the vaccine requires a diluent, multiply the number of millilitres of diluent per vial times the total number of vials required.

_____	x	_____	=	_____
Diluent required per vial		*Total number of vial*		*Total diluent to order*

7. Estimate the number of sterile needles and syringes that will be needed to carry out the activity. If single-use needle and syringes are used, order the same amount as for the estimated number of doses in Step 4.
8. In addition, 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

APPENDIX 5.5: RECOMMENDED VACCINATION PRACTICES

Work with your EPI team to give refresher training to the vaccinator teams that will conduct the emergency immunization activity. As a minimum, make sure vaccinator teams know how to:

1. Reconstitute the vaccine correctly:
    - Determine the appropriate quantity of diluents to reconstitute the freeze-dried vaccine.
    - Use a sterile syringe and sterile needle for each dose.
    - Using the dilution syringe, draw up and expel the diluents several times in the vial that contains the vaccine so as to mix the reconstituted vaccine well.
2. Wrap the vial in silver foil or cover it with a dark cloth. This will protect the vial from sunlight.
3. In a field situation, protect the vaccine and diluents from contamination. Cover the open top of the vial with foil to keep out dirt and flies.
4. Place reconstituted vaccine vials and opened liquid vaccine vials immediately into a cup of ice, or stand them on an ice pack. Keep the ice and vaccines in the shade.
5. Follow the national policy for reusing opened liquid vaccine vials such as DTP.
6. Record the dose on an immunization card for each person immunized.
7. Collect data for monitoring the activity. For example, record the number of doses given on a tally sheet so that coverage from the campaign can be calculated.
8. Remind health workers about the risk of getting blood-borne diseases from an accidental needle stick injury. Review safe practices for handling and disposing of sharp instruments and needles using a sharps container (safety boxes)
9. Arrange for safe disposal of used injection materials at the end of the activity. They should be burned in an appropriate incinerator
10. Give instructions for use of safe injection techniques. Review with health workers the need to plan vaccination campaigns.

APPENDIX 5.6: EXAMPLES OF MESSAGES FOR COMMUNITY EDUCATION

Improve hand-washing

Hand-washing with soap is one of the most effective way to prevent transmission of some organisms causing infectious diseases. For that reason, promote hand-washing in every family. Hand-washing is particularly important after defecation, after cleaning a child who has defecated, after disposing of a child's stool, before preparing or handling food and before eating.

Hand-washing is practiced more frequently where water is plentiful and within easy reach. If possible, water for washing should be stored separately from drinking-water. During an epidemic, soap should be provided to those without it. If soap is not available, ash or earth can be used to scrub the hands. Do not dry washed hands with dirty cloths. Air-dry wet hands.

The Message:

ARE YOU PROTECTED FROM DYSENTERY (bloody diarrhea)?
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 and 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:

- Wash hands with soap before preparing food
- Thoroughly wash the fruit and green vegetables before consuming using clean water
- Cook food until it is hot throughout
- Eat food while it is still hot, or reheat it thoroughly before eating
- Wash all cooking and serving utensils after use
- Keep cooked food and clean utensils separate from uncooked foods and potentially contaminated utensils
- Cover your food appropriately.

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.

Message:

Five Keys to Safer Food

- Keep clean
- Separate raw and cooked
- Cook thoroughly
- Keep food at safe temperature
- Use safe water and raw materials

Clean drinking water and storage

- Community drinking water supply and storage
    1. *Piped water*. To maintain safety, properly chlorinate piped water. To prevent entry of contaminated groundwater into pipes, repair leaking joints and maintain constant pressure in the system.
    2. *Closed wells*. Equip with a well-head drainage apron, and with a pulley, windlass, or pump.
    3. *Trucked in*. If locally available water is likely to be contaminated, drinking water should be supplied by tankers or transported in drums, if it is adequately chlorinated and a regular supply can be ensured. The trucking of water, however, is expensive and difficult to sustain; it is usually considered a short-term measure until a local supply can be established.
- Home drinking water storage and treatment

When the safety of the drinking water is uncertain, it should be chlorinated in the home or boiled. Several products for the home purification of water are available in Rwanda (Sur Eau, Pur, or Safi): you can purify your water using any of them.

To prevent contamination of drinking water, families should store drinking water using one of the following types of containers

1. *Covered containers* that are cleaned daily and kept away from children and animals. Water should be removed from the containers using a long-handled dipper, kept especially for this purpose.
2. *Narrow-mouthed containers* with an opening too small to allow the insertion of a hand. Water should be removed by pouring from the opening or spout.

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 human waste

High priority should be given to ensuring the safe disposal of human waste at all time, and especially during epidemics of diarrhoea. Sanitary systems appropriate for local conditions should be constructed with the cooperation of the community.

Community messages should emphasize:

- Everyone should use latrines properly, including children
- Transfer children's excreta with a scoop or shovel to the latrine or bury in a hole.

- Avoid defecating on the ground, or in or near the water supply.

When large groups of people congregate “as for fairs, funerals, or religious festivals”, ensure the safe disposal of human waste. If there is no latrine, designate areas for defecation and provide a shovel to bury the excreta.

Message:

ARE YOU PROTECTED FROM DYSENTERY (bloody diarrhoea)?

DO YOU USE A TOILET OR LATRINE?

Germs that cause dysentery live in feces. Even a person who is healthy might have dysentery germs.

 A*lways 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

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. Encourage safe funeral and burial practices

Reduction of mosquito exposition

The measures to fight against mosquito are the main intervention for the reduction of the transmission of the malaria. It allows to decreasing malaria transmission to a low level. In areas where there is a high transmission, the measures to fight against mosquito permits to reduce the infantile and maternal death rate. The individual protection against the stings of mosquito represents the first line of defense against the malaria.

Message:

ARE YOU PROTECTED AGAINST THE MOSQUITOS STINGS?

When is it possible?

- Avoid leaving between the twilight and the dawn, it is an auspicious period to mosquito stings

- During the night, wear clothes with long sleeves and long trousers and avoid the dark colors that attract the mosquito
- Apply a repulsive product on the skin (if product available)
- Install mosquito screens in the doors and to the windows
- Impregnate the beds' mosquito net with appropriate insecticide
- Use an anti - mosquito spray or a distributor of insecticide (if available)

The transmission of the malaria can be reduced quickly by the use of the pulverizations. This method is efficient during 3 at 12 months, according to the used insecticide and the treated surface.

APPENDIX 5.7: OUTBREAK COMMUNICATION

Introduction

Following confirmation and verification of the event, the primary health and the district level authorities should liaise with the national level authorities to communicate and receive guidance on common positions to be delivered to the media.

From first announcement throughout the outbreak, communication from the district level should follow the directions and the key messages developed at national level in consultation with the field team, in order to ensure consistency and speaking with one voice.

Even though communication should be centrally coordinated by the national level, media would approach local and district public health response level to obtain first hand information from direct sources.

In addition, the director of the district hospital should support the communication and provide scientific expertise as evidence for intervention.

Actions at the district level

- Identify spokesperson(s) at district level (political and technical);
- Liaise regularly with national authorities to provide them with first hand information (received at the community local level, the media, local stakeholders);
- Be in contact regularly with national authorities to receive common messages including guide and answers for frequently asked questions to feed the local media;

- Be available for interviews by local media upon request to provide accurate, transparent and updated information following directions from national level in simple clear key messages;
- Organize press briefings to provide regular information to local media, following directions from national level;
- Develop good relationships with local media to partnership for delivery of accurate, transparent, timely messages to the population;
- Use information materials developed at the national level with clear consistent messages to provide guidance to the population;
- Identify local powerful channels for the delivery of information to the population;
- Meet regularly with local stakeholders to disseminate correct message of prevention and surveillance to the population;
- Organize preventive door-to-door campaigns to reach the remote rural areas and promote prevention and surveillance, following directions from national level

APPENDIX 5.8: ESSENTIAL STOCK ITEMS FOR RESPONDING TO OUTBREAKS

Essential Stock items for Responding to Outbreaks				
Drugs	**Disinfectants, Insecticides and Rodenticides**	**Supplie**	**Vaccines**	**Equipment**
Benzyl penicillin	**Disinfectants**	Auto-disable syringes	Meningitis vaccines AC	Body bags
Ciprofloxacin	2% Chlorine	Auto-disable syringes	Meningitis vaccines ACW135	Buckets
Diazepam	Bleach	Bed nets	Meningitis vaccines Conjugated	Camping kits
Doxycycline	Calcium hypochlorite	Personal Protective Equipment (see Annex 4D)	Cholera vaccines	Candles
Drugs for supportive care	Cresol	laboratory supplies (see Annex 4C)	Tetanus anatoxin	Computer
Erythromycin	Sodium hypochlorite	Mosquito nets	Yellow fever	Containers
Nalidixic acid	**Pesticides**	Nasogastric tubes 2.7 mm OD, 38 cm	Other vaccines	Cook-ware
Oily chloramphenicol	Cypermethrin	Nasogastric tubes 5.3 mm OD, 50 cm		Diesel
Oral rehydration salts	Malathion	Needles		Front lamp
Paracetamol	Permethrin	Intravenous giving sets (		GPS

		different sizes)		
Penicillin V	**Rodenticides**	Teaspoons		Kerosene lamp
Rehydration fluids:	Brodifacom	Sprayers (pump and fogger)		Laboratory: see annex 5a
Ribavirin	Bromadione			Lamps
Ringer lactate				Maps
Streptomycin				Paraffine
Tetracyclin				Phones
Trimetroprim-sulfamethoxazole				Plastic sheets
				Power generator
				Radio
				Sprayers

SECTION 6: FEED-BACK MECHANISMS

This chapter outlines the steps to:

- Report on epidemic response
- Develop summary findings and recommendations based on reported surveillance data
- Develop and disseminate an epidemiologic or public health periodic bulletin

FEEDBACK PROVISION

The feedback to health facilities which reported surveillance data constitutes a good mechanism to improve understanding of the importance of surveillance and maintain high quality data for public health actions. It aims also at creating awareness on certain diseases and disseminating results obtained from surveillance programs. Very often, Community health workers, and Health facilities report surveillance data to higher levels of authority. The feedback should also follow the same route. When reporting facilities do not receive feedback from the high level authority it may diminish the importance of the data collected by these entities. In addition lack of feedback results in demotivation of staff involved in the surveillance system. Consequently, this will negatively impact on future reporting as well as on the quality of the data.

Anyone at the health facility level or national level who receives a report should provide feedback to the sender. At the national level the EID Division at RBC/RBC/IHDPC will analyze the reports received and provides feedback to the district hospitals. Likewise, District Hospitals will analyze data from the health centers and provide the required feedback for health centers in their catchment area.

The aim of providing feedbacks to health facilities is to strengthen the efforts taken by health workers to participate in the surveillance system. The feedback can issue in form of writing through a weekly, monthly bulletin or orally, for example during a monthly staff meeting or by phone.

In this chapter, the example of district hospital will be used to illustrate the feedback procedures. These procedures can also be applied at the health facilities and at the national level.

PREPARE FEEDBACK ON ROUTINE SURVEILLANCE DATA (WEEKLY REPORT)

District hospitals should analyze weekly reports submitted by health centers and generate feedback for the health centers in their catchment area. The reports can be summarized into charts and/or tables disaggregated by age, health facility and time. The feedback should contain short narratives and recommendations to address observed issues. Additionally, best practices upon established surveillance standards should be highlighted in the feedback report. (Refer to Feedback generic template). District hospitals should provide weekly feedback to the health as soon as report is received either through telephone or email. Monthly more elaborated feedback should be drafted and shared with the health centers.
The same process applies to the national level including RBC/RBC/IHDPC and RBC/NRL DIVISION towards district hospital.

PREPARE EPIDEMIC RESPONSE REPORT

After implementing measures to respond to an outbreak, the district hospital must prepare a report for the health facilities and central level (RBC/RBC/IHDPC) (see Appendix 28). This template can be used as feedback for the health levels that were the first to report the case.

SUMMARY REPORT

The summary report presents data and their interpretation in form of a table or graph. For example:

- During a staff meeting or a supervision visit, the summary report is used to present the data of a specific period of time to health workers. It is in form of simple table and/or chart that can guide the discussion and help draw conclusions.
- On a separate sheet, complete a trend analysis of surveillance data comparing the data over times. The difference between data submitted for this period and those communicated in other periods or targeted population should be analyzed. For example, the number of cases of non bloody diarrhea reported in the previous year in the same period. Compare these figures with those covering the corresponding period

during this year, for example after the implementation of the water tank projects in a high risk area.

CREATE AND DISSEMINATE EPIDEMIOLOGIC AND/OR PUBLIC HEALTH BULLETIN.

The RBC/RBC/IHDPC publishes epidemiological weekly bulletin. These bulletins' audience includes the health professionals at national, district levels and the general public (administrators, leaders, community health workers etc.). They should generally be brief (2 to 8 pages) and use a simple language that can be understood by non medical people.

The bulletins should at least contain:

- A summarizing table showing the number of cases and deaths reported in a given period or each priority disease important
- Report timeliness and completeness by health facilities, districts
- Outbreak investigation report (if any)
- Comments and recommendations on a disease or specific issues

The surveillance bulletin should be availed and shared to all health facilities involved in disease surveillance. Supervision visits are channels to share these bulletins with health workers.

PUBLIC AWARENESS BROCHURES OR FLYERS

These brochures are brief summaries on 1 or 2 pages, prepared by health workers for the benefit of the wider public. They deal generally with a single subject or contain no more than one message. For example, the district wishes to provide to the community information on a Shigellosis outbreak. The sheet will present in Kinyarwanda, the mode of transmission, a table indicating the number of cases and deaths, the steps to be followed for hands washing and food hygiene. These publications can be presented on a notice board or distributed among community associations that plan health education campaign

APPENDICES FOR SECTION 6

Appendix 6.1: National Epidemiological Bulletin Model

Appendix 6.2: Reporting format of an epidemiological survey

APPENDIX 6.1 : NATIONAL EPIDEMIOLOGICAL BULLETIN MODEL

Weekly Epidemiological Bulletin

Week n° 32 from 08 to 14 August 2011

Editorial Note

The aim of compiling this weekly bulletin is to present the epidemiological status of potential epidemic diseases at the national level. Thus, this bulletin contains registered weekly cases of diseases and deaths.

It also provides information on current epidemics, measures undertaken to confront them by concerned authorities, namely the Ministry of Health, Provinces as well as other partners.

Epidemics

During this ended week, we didn't register any epidemic because no abnormal increase of cases has been observed.

*Weekly notification of cases is done by ordinary mail addressed to the Unity in Charge of Epidemiology and Prevention of Diseases (Intended to the epidemiology desk), telephone number 578472; fax number **578473.** Or finally using the mobile telephone number 0788301902.*

This week's completion rate has been 97.5%, that is to say 39 health districts out of 40

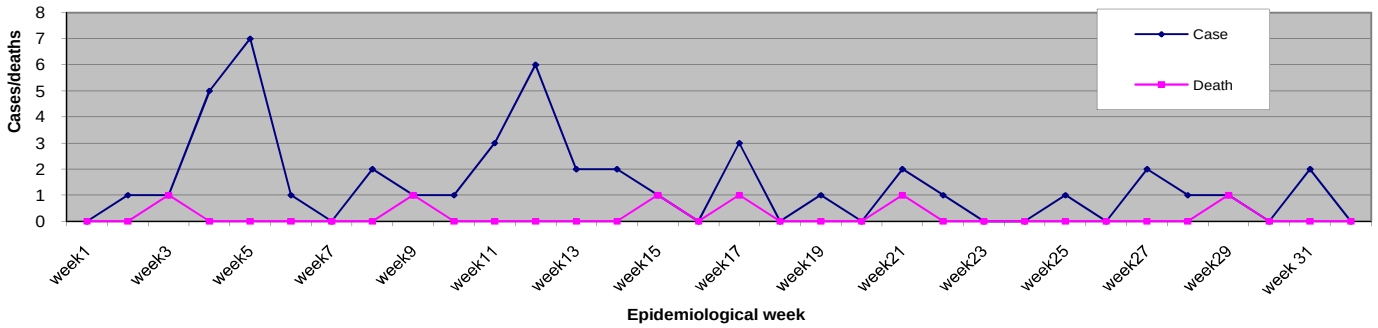
Mugonero Health district has not submitted its report.
During this week, Health districts have reported 478 bloody diarrhea cases and 3.016 cases of non bloody diarrhea.

Malaria

In the same week, the health districts have reported 12,436 cases of suspected malaria including 6 death cases reported by Byumba (2), Munini (1) and Rwamagana (3). Then 10,513 of confirmed malaria cases were reported with 6 notified deaths by Byumba (1), Kibungo (3) and Kibuye (1).

Overall, the districts have reported 22,949 cases of malaria including 12 deaths.
Other diseases in the bulletin have reported 0 case of cholera, 0 case of meningitis, 1 case of Acute Flaccid Paralysis (AFP) reported by the health district of Ruhengeri and 0 cases of measles.

Weekly Evolution of miningitis at the national level since the first week up to the 32nd 2010



District/Disease	DS	DNS	Cholera	Miningitis	PFA	Total measles	Vaccinated measles	TNN	Typhus	Fever Hemo	Plague	Rabis	Suspected malaria	Confirmed Malaria
Gakoma	9	69	0	0	0	0	0	0	0	0	0	0	324	295
Kabutare	21	93	0	0	0	0	0	0	0	0	0	0	598	744
Nyanza	16	74	0	0	0	0	0	0	0	0	0	0	317	251
Kibilizi	12	51	0	0	0	0	0	0	0	0	0	0	313	483
Byumba	74	288	0	0	0	0	0	0	0	0	0	0	983	306
Ngarama	9	47	0	0	0	0	0	0	0	0	0	0	592	164
Kibogora	10	92	0	0	0	0	0	0	0	0	0	0	245	142
Bushenge	9	71	0	0	0	0	0	0	0	0	0	0	579	481
Gihundwe	2	31	0	0	0	0	0	0	0	0	0	0	151	60
Mibilizi	9	91	0	0	0	0	0	0	0	0	0	0	389	167
Kaduha	1	46	0	0	0	0	0	0	0	0	0	0	57	75
Munini	3	56	0	0	0	0	0	0	0	0	0	0	40	76
Kigeme	5	91	0	0	0	0	0	0	0	0	0	0	79	188
Gisenyi	24	144	0	0	0	0	0	0	0	0	0	0	329	217
Muhororo	4	35	0	0	0	0	0	0	0	0	0	0	272	113
Shyira	3	47	0	0	0	0	0	0	0	0	0	0	62	63
Kabaya	1	21	0	0	0	0	0	0	0	0	0	0	28	1
Gitwe	3	42	0	0	0	0	0	0	0	0	0	0	258	184
Remeraruko	3	54	0	0	0	0	0	0	0	0	0	0	199	285
Kabgayi	16	98	0	0	0	0	0	0	0	0	0	0	1299	889
Kibungo	5	96	0	0	0	0	0	0	0	0	0	0	446	597
Rwamagana	60	49	0	0	0	0	0	0	0	0	0	0	182	354
Rwinkwavu	1	19	0	0	0	0	0	0	0	0	0	0	81	141
Kirehe	12	110	0	0	0	0	0	0	0	0	0	0	405	80
Mugonero														
Murunda	3	45	0	0	0	0	0	0	0	0	0	0	89	11
Kibuye	16	163	0	0	0	0	0	0	0	0	0	0	201	122
Kirinda	7	19	0	0	0	0	0	0	0	0	0	0	169	76
Muhima	48	156	0	0	0	0	0	0	0	0	0	0	842	445
Kabuga	3	42	0	0	0	0	0	0	0	0	0	0	240	351
Bugesera	9	71	0	0	0	0	0	0	0	0	0	0	579	481
Ruli	15	60	0	0	0	0	0	0	0	0	0	0	221	423
Rutongo	9	69	0	0	0	0	0	0	0	0	0	0	151	449
Gatonde	7	74	0	0	0	0	0	0	0	0	0	0	161	124
Gitare	9	195	0	0	0	0	0	0	0	0	0	0	428	460
Nemba	8	64	0	0	0	0	0	0	0	0	0	0	156	206
Ruhengeri	5	124	0	0	1	0	0	0	0	0	0	0	274	249
Kiziguro	0	16	0	0	0	0	0	0	0	0	0	0	284	179
Nyagatare	22	65	0	0	0	0	0	0	0	0	0	0	211	388
Gahini	5	38	0	0	0	0	0	0	0	0	0	0	202	193
total	478	3016	0	0	1	0	0	0	0	0	0	0	12436	10513

APPENDIX 6.2: REPORTING FORMAT OF AN EPIDEMIOLOGICAL SURVEY

_____

_____

_____ 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)
- Laboratory specimens collection
- Description of response and intervention (include dates)
- Data management

Results:

- Date and location of first known (index) case
- Date and health facility where first case was seen by the health care system
- Results of additional case finding
- Laboratory 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 (tables) and line lists
- Results of response and evidence of impact

Self-evaluation of the timeliness and quality of preparedness, outbreak detection, investigation, and response

Epidemic Preparedness

Indicator	**Yes**	**No**
Were adequate drugs and medical supplies available at the onset of the outbreak		
Were treatment protocols available to health workers?		
Does the district epidemic management committee regularly meet as part of epidemic preparedness?		

Outbreak Detection

Indicator	**Date 1**	**Date 2**	**Intervalle**
Interval between onset of index case (or occurrence of an unusual cluster at the community level) [date 1] to arrival of first outbreak case at the health facility [date 2] (Target: <3 days)			
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)			
Cumulative interval between onset of index case (or occurrence of an unusual cluster at the community or health facility) [date 1] to notification to the district [date 2] (Target: <7 days)			

Outbreak investigation

Indicator	**Yes**	**No**
Were case forms and line lists completed?		
Were laboratory specimens taken (if required)?		

Indicator	Date 1	Date 2	Intervalle
Interval between notification of district [date 1] and district field investigation conducted [date 2] (Target: within 48 hours)			
Interval between sending specimens to the laboratory [date 1] and receipt of results by the district [date 2] (Target: 3-7 days, depending on type of test)			

Outbreak response:

Indicator	Date 1	Date 2	Intervalle
Interval between notification of outbreak to district [date 1] and concrete response by the district [date 2] (Target: within 48 hours of notification)			

Evaluation and Feedback:

Indicator	Date 1	Date 2	Intervalle
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)			

Indicator	Yes	No
Did the outbreak management committee meet to review investigation results?		
Was feedback given to health facilities and community?		

Evaluation of other aspects of the response:

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: MONITOR, EVALUATE AND IMPROVE SURVEILLANCE AND RESPONSE

This section describes how to:

- Identify targets and indicators
- Monitor the quality of surveillance activities at the district level
- Supervise surveillance and response activities
- Evaluate the surveillance and response system
- Take action to improve surveillance and response system

MONITOR, EVALUATE AND IMPROVE SURVEILLANCE AND RESPONSE

Monitoring of surveillance and response systems refers to the routine and continuous tracking of planned surveillance activities (for example, reports are received on time). Evaluation periodically (for example annually) assesses whether surveillance and response objectives have been achieved. Both monitoring and evaluation are used to 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. Each month they make conclusions about:

- The timeliness and completeness of reporting from each level, and
- The quality of 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 routinely monitor and annually evaluate:

- The timeliness in reporting immediately-notifiable diseases, conditions or events
- Outbreak investigations and responses and
- Reporting of summary data on a routine basis.

When problems are detected in the surveillance and response system, action can be taken to strengthen the system. By making corrections as they are identified, it is more likely that the

end of the year results will show the desired outcomes. For example, use the monthly monitoring data to do an evaluation at the end of the year. Questions to help evaluate include:

- Are surveillance objectives for existing activities being met?
- Was surveillance data used for taking public health action?
- Did surveillance, laboratory and response activities have an impact on the outcome of health events in the district?

The information in this section will describe how to routinely monitor and annually evaluate the performance of the surveillance system and specific disease or public health events control and prevention programs.

IDENTIFY TARGETS AND INDICATORS

Using 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.

Use indicators in accordance with national goals and 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.

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 or public health events (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.)

- Additional indicators may be necessary to measure the impact of public health interventions

Suggested indicators (core indicators for the district level, province and for the national level) as well as a chart for monitoring core indicators at the health facility are in Annexes of this section.

TABLE 6: INDICATORS FOR MONITORING PERFORMANCE OF CORE FUNCTIONS OF INTEGRATED DISEASE SURVEILLANCE AND RESPONSE

1.	Proportion of health facilities submitting weekly (or monthly) surveillance reports on time to the district
2.	Proportion of districts submitting weekly (or monthly) surveillance reports on time to the next higher level
3.	Proportion of cases of diseases targeted for elimination, eradication and any other diseases selected for case-based surveillance that were reported to the district using case-based or line-listing forms
4.	Proportion of suspected outbreaks of epidemic-prone diseases notified to the next higher level within 2 days of surpassing the epidemic threshold
5.	Proportion of districts in which a current trend analysis (line graph or histogram) is available for selected priority diseases
6.	Proportion of reports of investigated outbreaks that include analyzed case-based data
7.	Proportion of investigated outbreaks with laboratory results
8.	Proportion of confirmed outbreaks with a nationally recommended public health response
9.	Case fatality rate for each epidemic prone disease reported
10.	Attack rate for each outbreak of a priority disease
11.	The number of epidemic detected at the national level that were missed by the district level during the last year
12.	Proportion of districts that report laboratory data for diseases under surveillance
13.	Proportion of district laboratories that received at least one supervisory visit that included written feedback from the provincial or national level during the last year
14.	Proportion of provinces reporting monthly analyzed laboratory data to the national reference laboratory

TABLE 7: INDICATORS FOR MONITORING PERFORMANCE OF CORE FUNCTIONS FOR IHR (2005) IMPLEMENTATION

1.	Proportion of Hospitals with Infection Prevention and Control (IPC) requirements established
2.	Proportion of districts with Public health risks and resources mapped
3.	Proportion of districts reporting information using event-based surveillance
4.	Proportion of districts provided by national authorities with laws or instruments sufficient for implementation of obligations under IHR
5.	Proportion of districts with mechanism for the coordination of relevant sectors in the implementation of IHR established

SELECT DATA FOR MEASURING THE INDICATORS

After you have selected relevant indicators, specify the numerator and the denominator. For example, a district objective is for all health facilities to keep trend lines for selected priority diseases. The numerator and denominator are defined as follows:

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.

ENSURE SOURCES OF DATA ARE AVAILABLE

Each level should make sure that the level it supervises has the following sources of data available.

Form	Health Facility	District	Provincial	National
Monitoring chart for tracking indicators (*Sample charts are in Annex 8A.)*	X	X	X	X
Outpatient register	X			
Inpatient register	X			
Health facility reporting forms	X			
Case-based and/or line listing reporting forms	X	X	X	X

Outbreak investigation report	X	X	X	X
Log of suspected outbreaks and rumours	X	X	X	X
Supervisory reports from district and/or province	X	X	X	X
laboratory reports received	X	X	X	X

MONITOR THE QUALITY OF THE SURVEILLANCE ACTIVITIES AT DISTRICT LEVEL

An important indicator of a quality reporting system is the timeliness and completeness at each level. When reports are sent and received on time, the possibility of detecting a problem and conducting 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 public health problems will be missed.

NOTIFICATION OF IMMEDIATELY REPORTABLE DISEASES OR EVENTS

Monitor how well the system is able to detect immediately notifiable diseases or events. Monitor the interval between the onset of the first known case and when first case was seen in the health facility. If this interval is too long, it will seriously affect the outcome of individual patients and will alter the spread of the outbreak.

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 (within 48 hours).

MONITOR THE 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 8G 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 timely, i.e., submitted before the last day of the following month (for example, March data received by the next level by 30 April).

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 a reliable supply of forms or other reporting method such as text messaging or radiophone is available). Additionally, ask if a new staff person has started at the facility and has yet to receive orientation on the procedure for reporting. Or, find out if health staff receives feedback about reports they have made and have resources to take action as a result of the information.

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.

REPORT TIMELINESS AND COMPLETENESS TO OTHER LEVELS

Then routine reports of the number of cases are sent to the provincial, regional or national level, also send the necessary 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.

SUPERVISE SURVEILLANCE AND RESPONSE ACTIVITIES

Supervision is a process of helping to improve 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 professional work together to review progress, identify problems, decide what has caused the problem and develop feasible solutions.

PREPARE JOB DESCRIPTIONS FOR SURVEILLANCE 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 to perform
- To whom the staff person reports

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. For 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 centres and community reporting sites in the overall plan. Include private health centers, if feasible.

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 (such as the one in Annex 8H) 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 staffs 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 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 Analyse 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 8H 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.

CONDUCT SUPERVISORY VISITS

Begin regularly scheduled supervision in the district to ensure that:

- Appropriate supplies (e.g. forms, job aids) and required standard case definitions/ guidelines are available.
- Health staffs 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. Let the health staffs know what is working well and what is not working. Also give feedback on how the data reported previously was used to detect outbreaks and take action to reduce 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.

WRITE A REPORT OF THE SUPERVISORY VISIT

Put 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.

USE SUPERVISORY VISITS TO IMPROVE SURVEILLANCE ACTIVITIES

Visits of surveillance supervisors and regional or provincial disease control programs are good opportunities to discuss and improve disease control in your district. For example, if a national malaria control person visits the district, you might discuss why the inpatient malaria deaths have not been declining. You can ask about additional ideas or resources that the malaria control program can provide.

EVALUATE PERFORMANCE OF SURVEILLANCE AND RESPONSE SYSTEM

The purpose of the evaluation is to assess the effectiveness of the surveillance and response system in terms of timeliness quality of data, preparedness, case management, overall performance and using the indicators to identify gaps or areas that could be strengthened.
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.

COMPILE AND ORGANIZE MONITORING DATA AND OTHER RESULTS

The **district health office** should summarize the surveillance data received from all health facilities in the catchment area, and submit the compiled report to the province or national level as appropriate. The submission of the report should not be delayed until reports from all health facilities are received. Submit all reports received on time. Late reports may be submitted when they arrive. Follow up with health facilities who did not report or who consistently provide late reports.

Help the health facility to solve any problems that prevent them from submitting their summary reports on time. Provide feedback to health facilities about the indicator results on a regular basis. Feedback is a positive tool for motivating health staff to provide information on time and contribute to the national system.

The **provincial health department** should compile the surveillance data received from all districts in the province and submit the report to the national level. Submission of the report should not be delayed until the last report is collected. The province should compile and submit the available reports on time. The late reports may be sent separately when they are received.

The **national level** should compile the surveillance data received from all the provinces (or regions). The national level should look for epidemics that were not identified by the districts. Follow up with areas where reporting continues to be unreliable or does not happen at all. Support the provinces in providing assistance to the districts when they evaluate the measurements and take action to improve the situation. Provide feedback to each of the levels about the national, provincial, district and health facility levels.

Use a monitoring chart such as the one on the next page to monitor performance of the indicators at your level. Share these results with the staff in your catchment level. Acknowledge successes and help health staff to maintain the positive progress. When problems occur, talk together about what is causing the problem and how it can be solved. Seek assistance of the next level as needed for obtaining additional help or resources.

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 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.

ANALYZE RESULTS

As you evaluate the summary data for the year, some items to decide on are:

- Were the reports complete, on time and accurate?
- What were significant changes in disease or event 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?
- Were appropriate measures taken to prevent similar events?

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, find out 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.

UPDATE PLANS FOR IMPROVEMENTS TO SURVEILLANCE AND RESPONSE

Include in the district plan 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 (if any).
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).

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 achieve
- 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.

APPENDICES FOR SECTION 7

Appendix 7.1 IDSR core indicators for the health facility level

Appendix 7.2 Chart for monitoring performance of IDSR indicators at health facility level

Appendix 7.3 IDSR core indicators for the district level

Appendix 7.4 IHR core indicators for monitoring the implementation at district level

Appendix 7.5 IDSR core indicators for the national level

Appendix 7.6 Sample form for recording timeliness and completeness of monthly reporting from the health facility to the district level

Appendix 7.7 Checklist for supervising surveillance and response activities at the health facility

Appendix 7.8 Monitoring chart for use of indicators at district, regional or provincial level

APPENDIX 7.1: CORE INDICATORS FOR THE HEALTH FACILITY LEVEL

Indicator	Purpose	Numerator	Denominator	Source of information	Target
1. Proportion of complete[5] surveillance reports submitted on time to the district	Measures the practice of health facilities in submitting timely surveillance reports to the next level	Number of complete surveillance reports submitted on time to the district	Number of expected surveillance reports from the health facility	Monitoring chart for timely submission of report[6]	80%
2. Proportion of priority diseases for which a current line graph[7] is avail laboratory.[8]	Measures the practice and capacity to analyze surveillance data	Number of priority diseases for which a current line graph is available.	Number of priority diseases	The activity checklist for the "in charge" at the health facility and the IDSR summary reporting forms from the health facility	80%
3. Proportion of cases of diseases targeted for	Measures reporting of surveillance data	Number of diseases selected for case-	Total number of cases of diseases	Routine summary reports and case-based	80%

[5] "Complete" in this indicator means that all possible cells in the reporting forms are filled in.
[6] A chart for monitoring health facility performance is on the next page.
[7] The national IDSR team should define the list of diseases for which a line graph should be kept at the health facility level. AFRO recommends that at a minimum, health facilities maintain current line graphs for 1) weekly trend analysis of cerebrospinal meningitis, particularly in the meningitis belt countries, 2) monthly malaria inpatient cases and deaths in children under 5 years of age and 3) trends for malaria in children under 5 years of age.
[8] "Current" in this indicators means that the line graph display should reflect data within the past three months from the day of the assessment.

elimination, eradication and any other disease selected for case-based surveillance reported with case-based forms or line lists.	with detailed information to use for further analysis	based surveillance reported with case-based forms or line list	selected for case-based surveillance that occurred in the health facility	or line listing reports	
4.Proportion of suspected outbreaks of epidemic prone disease notified to the district level within 2 days of surpassing the alert threshold	Measures early detection and timely reporting of outbreaks	Number of suspected outbreaks of epidemic prone diseases notified to the district within 2 days of surpassing the alert threshold	Total number of suspected outbreaks of epidemic prone diseases in the health facility	Health facility log of suspected outbreaks and rumors	80%
5.Case fatality rate for each epidemic prone disease reported	Measures quality of case management	Number of deaths from each of the epidemic-prone diseases	Number of cases from the same epidemic-prone disease	Routine reports and outbreak investigation reports	Depends on disease

APPENDIX 7.2: CHART FOR MONITORING PERFORMANCE OF IDSR INDICATORS

Instructions

Use this chart to keep track of the health facility's performance with those indicators relevant to health facility performance for IDSR.

Each month, summarize and compile the health facility's summary data for priority diseases.

Report the summary data to the district level on time. Record on this chart the indicator results.

Share this chart with the district supervisor during his or her visit to the health facility, or bring it to the quarterly district meeting.

Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Proportion of complete surveillance reports submitted on time to the district												
Proportion of priority diseases for which a current line graph is available												
Proportion of cases diseases selected for case-based surveillance, which were reported to the district using case-based or line listing forms												

Proportion of suspected outbreaks of epidemic prone diseases notified to the district level within 2 days of surpassing the epidemic threshold												
Case fatality and attack rate for each epidemic-prone disease reported												
Reply YES or NO to the following checklist items												
Were surveillance reports submitted on time?												
Are the trend graphs up-to-date?												
If YES, have you observed any changes in the trends?												
If YES, has the threshold been crossed?												
If YES, have you taken action to alert the district?												

APPENDIX 7.3: CORE INDICATORS FOR THE DISTRICT LEVEL

Indicator	Purpose	Numerator	Denominator	Source of information	Target
1 Proportion of health facilities submitting surveillance reports on time to the district	Measures the timeliness of submission of surveillance reports	Number of health facilities that submitted surveillance reports on time to the district	Number of health facilities in the district	Monitoring chart for timely submission of report[9]	80%
2 Proportion of cases of diseases targeted for elimination, eradication and any diseases selected for case-based surveillance reported with case-based forms or line lists.	Measures reporting of surveillance data with detailed information to use for further analysis	Number of diseases targeted for elimination, eradication, and any diseases selected for case-based surveillance reported with case-based forms or line list	Total number of cases of diseases selected for case-based surveillance that occurred in the district	Routine summary reports and case-based or line listing reports for diseases targeted for elimination and eradication and for any diseases selected for case-based surveillance	80%
3 Proportion of suspected outbreaks of epidemic-prone diseases notified to	Measures use of data and thresholds for early detection of outbreaks and	Number of suspected outbreaks of epidemic-prone diseases notified to the province within 2	Number of suspected outbreaks of epidemic-prone	Log of suspected outbreaks and rumors District analysis book or other routine	80%

[9] A chart for monitoring district indicator performance is in Annex 5.

Indicator	Purpose	Numerator	Denominator	Source of information	Target
the provincial level within 2 days or surpassing the epidemic threshold	timely reporting at the local level	days of surpassing the epidemic threshold	diseases in the district	analysis tool	
4 Proportion of priority diseases for which a current line graph[10] is available.[11]	Measures the practice and capacity of the district health management team to analyze surveillance data	Number of selected diseases (at least malaria and meningococcal meningitis in districts at high risk for meningitis) for which a line graph is available and current	Total number of selected diseases with a line graph (at least malaria and meningococcal meningitis if district is at high risk for meningitis)	Indicator monitoring chart District analysis book	80%
5 Proportion of health facilities that have current trend analysis (line graphs) for selected priority diseases	Measures the practice and capacity of the health facility team to analyze surveillance data	Number of health facilities that have current trend analyses for selected priority diseases	Total number of health facilities in the district	Supervisory report Health facility data analysis tools	80%

[10] The national IDSR team should define the list of diseases for which a line graph should be kept at the health facility level. AFRO recommends that at a minimum, health facilities maintain current line graphs for 1) weekly trend analysis of cerebrospinal meningitis, particularly in the meningitis belt countries, 2) monthly malaria inpatient cases and deaths in children under 5 years of age and 3) trends for malaria in children under 5 years of age.

[11] "Current" in this indicators means that the line graph display should reflect data within the past three months from the day of the assessment.

Indicator	Purpose	Numerator	Denominator	Source of information	Target
6 Proportion of reports of investigated outbreaks that include analyzed case-based data	Measures available of additional variables for further analysis	Number of outbreak investigation reports that include case-based data	Total number of outbreak investigation reports conducted in the district	Investigation report Epidemic curve Map Person analysis table Line lists or case-based reporting forms	80%
7 Proportion of investigated outbreaks with laboratory results	Measures capacity of laboratory to confirm diagnosis and involvement of laboratory in surveillance activities	Number of investigated outbreaks with laboratory results in a given time period	Total number of investigated outbreaks that occurred in a given time period	Log of suspected outbreaks and rumours laboratory reports Outbreak investigation reports	80%
8 Proportion of confirmed outbreaks with a nationally recommended public health response	Measures capacity of the district to respond to outbreaks	Number of confirmed outbreaks with a nationally recommended response	Number of confirmed outbreaks in the district	Log of suspected outbreaks and rumors Outbreak investigation reports Supervisory reports	80%
9 Case fatality rates for	Measures quality of case	Number of deaths from each of the outbreak	Number of cases from the same	Routine summary report	Will vary;

Indicator	Purpose	Numerator	Denominator	Source of information	Target
outbreaks of priority diseases	management	diseases	outbreak due to that disease	Outbreak investigation report	depends on disease
10 Attack rate for each outbreak of a priority disease	Helps to identify the population at risk and efficacy of the intervention	Number of new cases of an epidemic-prone disease that occurred during an outbreak	Number of population at risk during the outbreak	Demographic data about the district Outbreak investigation report with line lists or case-based forms	Will vary; depends on disease

APPENDIX 7.4: IHR CORE INDICATORS FOR THE DISTRICT LEVEL

IHR Indicator	Purpose	Numerator	Denominator	Source of information	Target
1.Proportion of Hospitals with Infection Prevention and Control (IPC) requirements established	Measures the practice and the Capacity of the hospital to apply infection control requirements	Number of Hospitals that reported having established Infection Prevention and Control (IPC) requirements established	C01. Total number of Hospitals in the District	Routine summary reports and supervisory reports	80%
2. Proportion of districts with Public health risks and resources mapped	Measures the practice and the Capacity o the district to conduct mapping of available resources and health risks	Number of districts that reported having conducted Public health risks and resources mapping	C02. Total number of districts targeted for public health risks and resources mapping	Risk assessment and mapping reports and supervisory reports	80%
3. Proportion of districts reporting information using Event-based surveillance	Measures the practice and the capacity of the district submitting surveillance	Number of districts reporting information using event-based surveillance methods	C03. Total number of districts	Routine summary reports and supervisory reports	80%

IHR Indicator	Purpose	Numerator	Denominator	Source of information	Target
	reports using event-based surveillance methods				
4. Proportion of districts provided by national authorities with laws or legal instruments sufficient for implementation of obligations under IHR	Measures use of laws or instruments to facilitate the implementation of IHR obligations	Number of districts reporting having been provided with laws or legal instruments	C04. Total number of districts	Routine summary reports and supervisory reports	80%
5. Proportion of districts with mechanism for the coordination of relevant sectors in the implementation of IHR established	Measures the practice and the capacity of the district to coordinate IHR implementation	C05. Number of districts which established mechanism for the coordination of relevant sectors in the implementation of IHR	C05. Total number of districts	Meetings reports and supervisory reports	80%

APPENDIX 7.5: CORE INDICATORS FOR THE NATIONAL LEVEL

Indicator	Purpose	Numerator	Denominator	Source of information	Target
1 Proportion of monthly IDSR reports submitted from the province to the national level on time in the last 3 months	Measures the practice of timely submission of surveillance data	Number of provinces that submitted IDSR reports on time to the national level	Total number of provinces that report to the national level	Monitoring chart Routine summary reports	80%
2 Proportion of health facilities submitting surveillance reports on time to the district	Measures practice of timely submission of surveillance data from health facilities to district	Number of health facilities submitting reports on time to the districts	Number of districts	Summary reporting forms	80%
3	Measures reporting of	Number of diseases targeted for	Number of diseases targeted for	Routine summary reports and	80%

Indicator	Purpose	Numerator	Denominator	Source of information	Target
Proportion of cases of diseases targeted for elimination, eradication and any diseases selected for case-based surveillance reported with case-based forms or line lists.	surveillance data with detailed information to use for further analysis	elimination, eradication, and any diseases selected for case-based surveillance reported with case-based forms or line list	elimination, eradication and any other disease selected for case-based surveillance	case-based or line listing reports	
4 Proportion of suspected outbreaks of epidemic prone disease notified to the national level within 2 days of surpassing the alert threshold	Measures early detection and timely reporting of outbreaks	Number of suspected outbreaks of epidemic prone diseases notified to the national level within 2 days of surpassing the alert threshold	Total number of suspected outbreaks of epidemic prone diseases	Log of suspected outbreaks and rumors Routine summary reports	80%

Indicator	Purpose	Numerator	Denominator	Source of information	Target
5 Proportion of districts in which a current line graph[12] is available[13] for selected priority diseases	Measures the practice and capacity to analyze surveillance data	Number of priority diseases for which a current line graph is available in the districts.	Number of districts	Supervisory reports District analysis book	80%
6 Proportion of reports of investigated outbreaks that includes analyzed case-based data	Measures available of additional variables for further analysis including possible risk factors involved	Number of outbreak investigation reports that include epi curve, mapping, personal tables and case-based forms or line lists	Number of outbreaks investigatation reports	Investigation reports Routine summary reports	80%

[12] The national IDSR team should define the list of diseases for which a line graph should be kept at the health facility level. AFRO recommends that at a minimum, health facilities maintain current line graphs for 1) weekly trend analysis of cerebrospinal meningitis, particularly in the meningitis belt countries, 2) monthly malaria inpatient cases and deaths in children under 5 years of age and 3) trend analysis of malaria in children under 5 years of age.

[13] "Current" in this indicators means that the line graph display should reflect data within the past three months from the day of the assessment.

Indicator	Purpose	Numerator	Denominator	Source of information	Target
7 Proportion of investigated outbreaks with laboratory results	Measures capacity of the laboratory to confirm the diagnosis and involvement of laboratory in the surveillance activities	Number of investigated outbreaks with laboratory results	Number of investigated outbreaks	Outbreak investigation reports laboratory reports Routine summary reports Log of outbreaks and rumours	80%
8 Proportion of confirmed outbreaks with a nationally recommended public health response	Measures capacity of the province to respond to outbreaks	Number of confirmed outbreaks with a nationally recommended public health response	Number of confirmed outbreaks	Log of suspected outbreaks and rumors Outbreak investigation reports Supervisory visit reports	80%

Indicator	Purpose	Numerator	Denominator	Source of information	Target
9 Case fatality rate for each epidemic prone disease reported	Measures quality of case management	Number of deaths from each of the epidemic-prone diseases	Number of cases from the same epidemic-prone disease	Routine reports and outbreak investigation reports	Depends on disease
10 Attack rate for each outbreak of a priority disease	Helps to identify the population at risk and efficacy of the intervention	Number of new cases of an epidemic-prone disease that occurred during an outbreak	Number of population at risk during the outbreak	Demographic data about the district Outbreak investigation report with line lists or case-based forms	Will vary; depends on disease
11 The number of epidemics detected at the national level and that were missed by the district level	Checks the capacity of the entire health system to detect epidemics and shows that the	Number of epidemics detected by the regional or national level from analyzing district specific data	Total number of epidemics reported by the districts	District summary reporting forms District analysis book Supervisory reports Standard surveillance reports	Zero

Indicator	Purpose	Numerator	Denominator	Source of information	Target
	national level is checking whether districts are observing trends				
12 Proportion of districts that report laboratory data for diseases under surveillance	Measures if districts are collecting and reporting laboratory data to higher level	Number of district laboratoriesthat submitted monthly data to higher level	Total number of district laboratorys	National log book of reports received	
13 Proportion of district laboratories that received at least one supervisory visit with written	Measures the support supervision district laboratories receive to help to solve	Number of district laboratories that received at least one supervision activity	Total number of district laboratories	Reports of the District Laboratory Focal Person -this may require field visits	

Indicator	Purpose	Numerator	Denominator	Source of information	Target
feedback by provincial/national level	problems				
14 Proportion of provincial laboratories reporting analysed laboratory data to the national laboratory	Measures how well provincial levels analyse district laboratory data	Number of provincial laboratories analysing and reporting to NPHL monthly	Total number of provincial laboratories	NPHL	

APPENDIX 7. 6: SAMPLE FORM FOR RECORDING TIMELINESS AND COMPLETENESS

Recording timeliness and completeness of monthly reporting from the health facility to the district

Legend: T = arrived on time; L = arrived late; NR=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												

*The timeliness and completeness are expressed as percentages (%). 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.

APPENDIX 7.7: CHECKLIST FOR SUPERVISION

SUPERVISION GRID FOR DISTRICT HOSPITAL

A.GENERAL INFORMATION

Supervision date: ……/……/……

District Hospital name: ……District: ……..

Name of Supervisor: ……

Name of Supervised person: ……

Date of last supervision: ……/……../…….

How many persons trained on IDSR /e-IDSR? .....

What are their current /functions: …….....

Comments:

…….....

……

B. IDENTIFY CASES

1. Availability of Standard Case Definition posters in the consultation room:

Yes: ……No: …

Comments:

…….....

……

2. Consultation registers:

The diagnosis of priority diseases corresponds to standard case definition?

Yes: ……No: …….

[Clinical history (symptoms/signs/ lab results) compared to standard case definition to verify presumptive diagnosis :(For 10 cases)]

Comments:

…….....

……

3. Laboratory:

Verify the existence of the documents and their filling:

- laboratory request: Yes: ……No: …….

Comments:

…….....

……

- Laboratory result: Yes: ……No: …….

Comments:

…….....

……

C. RECORD AND REPORT SUSPECTED CASES OR CONDITIONS TO THE NEXT LEVEL.

1. Reports: correctly and completely filled

- Immediate report: Yes: ……No: …….

Comments:

…….....

……

- Weekly report: Yes: ……No: …….

Comments:

…….....

……

2. Verify the correlation between Cases reported and consultation register:

- Immediate report: Yes: ……..No: ……

Comments:

…….....

……

- Weekly report… Yes: ……..No: ……

Comments:

…….....

……

D. ANALYSE AND INTERPRET DATA

1. Are the data on epidemic-prone disease displayed: (nb of cases and epidemic threshold):

Yes: ……No: …….

Comment:

…….....

……

3. A current trend analysis (graphs) is available for selected priority diseases:

Yes: ……No: …

Comments:

…….....

……

3. Proportion of suspected outbreaks of epidemic-prone diseases notified to the DH level within 2 days after reaching the epidemic threshold:……

Comments:

…….....

……

E. INVESTIGATE AND CONFIRM SUSPECTED CASES AND OUTBREAKS

1. In cases of priority disease detected since the last supervisory visit, how many laboratory results were obtained (if the disease requires laboratory tests)? ……..

Comments:

…….....

…….....2.

Do you have sufficient laboratory materials for samples collection for epidemic prone diseases?

Yes: …..No: ……..

Comments:

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…….....

3. Existence of line listing report (Rapport lineaire): Yes: ……No: ……Not applicable: ……...

Comment:

…….....

F. RESPOND

1. Do you have sufficient resources to the response to a confirmed outbreak (eg vaccines and vaccination materials, ORS, antibiotics, etc.)?

Yes: …..No: ……..

Comments:

…….....

……

2. Existence / availability of room(s) for isolation of patients with contagious diseases:

Yes: ……No: …….

Comments:

…….....

……

3. Existence of the Epidemic management Committee: Yes: ……No: …….

Comments:

…….....

……

4. Frequency of the meeting of the Epidemic management committee: …….

Comments:

…….....

……

5. Epidemic management Committee meeting report available:

Yes: ……No: …….

Comments:

…….....

……

6. Existence of outbreaks management report:

Yes: ….No: …....Not applicable: …….

G. PROVIDE FEEDBACK

1. Is the report of the previous supervision available?

Yes: …….No: ……

Check the recommendations of previous supervision and summarize what was not been applied:……

……
……
……
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…….....

2. Number of supervisory visit with feedback: ……

Comments:

…….....

……

H. EVALUATE AND IMPROVE THE SYSTEM

1. Existence of the action plan for IDSR activities (check also the status of implementation):

Yes: ……No: …….

Comments:

…….....

……

2. Check the availability of the documents related to IDSR:

- Technical Guideline: Yes: ……No: …….

Comments:

…….....

……
……

- Training Manual: Yes: ……No: …….

Comments:

…….....

……

- Others: …….

Comments:

…….....

……

3. How often do you provide to your staff the information or training regarding the fight against epidemics? (Check the training report) ……

Comments:

…….....

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4. Supervision:

- Frequency of supervisory visits in HC: ……
- Existence of supervision reports for each HC: Yes: ……No: …….

Verify the quality of report (Completely and correctly filled).

Comment:……

…….....……

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I. SUMMARY OF THE SUPERVISION

Strengths:

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Weaknesses:

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…… Recommendations:

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Supervised staff: **Supervisor:**

Name, Signature **Name, Signature**

Health Facility: _____

Date of Supervisory Visit:_____/_____/_____

SUPERVISION GRID FOR HEALTH CENTERS

A.GENERAL INFORMATION

Supervision date: ……/…../……

Health Center: ……District Hospital……. District: …….

Name of Supervisor: ……

Name of Supervised person: ……

Date of last supervision: ……..…/……../…….

How many persons trained on IDSR /e-IDSR? .....

What are their current /functions:

……..…….....

……..……

……..

Comments:

…….....

……

……

B. IDENTIFY CASES.

1. Availability of Standard Case Definition posters in the consultation room:

Yes: ……No: …

Comments:

…….....

……

2. Consultation registers:

The diagnosis of priority diseases corresponds to standard case definition?

Yes: ……No: …….

[Clinical history (symptoms/signs/ lab results) compared to standard case definition to verify presumptive diagnosis :(For 10 cases)]

Comments:

…….....

……

3. Laboratory:

Verify the existence of the documents and their filling:

- Laboratory request: Yes: ……No: …….

Comments:

…….....

……

- Laboratory result: Yes: ……No: …….

Comments:

…….....

……

C. RECORD AND REPORT SUSPECTED CASES OR CONDITIONS TO THE NEXT LEVEL.

1. Reports: correctly and completely filled

- Immediate report: Yes: ……No: …….

Comments:

…….....

……

- Weekly report: Yes: ……No: …….

Comments:

…….....

……

2. Verify the correlation between Cases reported and consultation register:

- Immediate report: Yes: ……..No: ……

Comments:

…….....

……

- Weekly report… Yes: ……..No: ……

Comments:

…….....

……

……

3. How often do you collect information from the community about the notification of cases and deaths, probably due to priority disease?

Daily: ……. weekly: …….. Monthly: ……

Comments:

…….....

……

……

D. ANALYSE AND INTERPRET DATA.

1. Are the data on epidemic-prone disease displayed: (nb of cases and epidemic threshold):

Yes: ……No: …….

Comments:

…….....

……

2. A current trend analysis (graphs) is available for epidemic-prone diseases:

Yes: ……No:

Comments:

…….....

……

3. Proportion of suspected outbreaks of epidemic-prone diseases notified to the DH within 2 days after reaching the epidemic threshold:…….

Comments:

…….....

……

E. INVESTIGATE AND CONFIRM SUSPECTED CASES AND OUTBREAKS

1. In cases of priority disease detected since the last supervisory visit, how many laboratory results were obtained (if the disease requires laboratory tests)? ……..

Comments:

…….....

……

2. Do you have sufficient laboratory materials for samples collection for epidemic prone diseases?

Yes: …..No: ……..

Comments:

…….....

……

3. Existence of line listing report (Rapport lineaire):

Yes: ……No: ……Not applicable: …….

Comments:

…….....

……

F. RESPOND

1. Do you have sufficient resources to the response to a confirmed outbreak (eg vaccines and vaccination materials, ORS, antibiotics, etc.)?

Yes: …..No: ……..

Comments:

…….....

……

2. Existence / availability of room(s) for isolation of patients with contagious diseases:

Yes: ……No: …….

Comments:

…….....

……

3. Existence of the Epidemic management Committee: Yes: ……No: …….

Comments:

…….....

……

4. Frequency of the meeting of the Epidemic management committee: …….

Comments:

…….....

……

5. Epidemic management Committee meeting report available: Yes: ……No: …….

Comments:

…….....

……
……

6. Existence of outbreaks management report: Yes: ….No: …...Not applicable: …….

Comments:

…….....

……

G. PROVIDE FEEDBACK.

1. Is the report of the previous supervision available?

Yes: …….No: ……

Check the recommendations of previous supervision and summarize what was not been applied:……

……

……

……

……

……

2. Number of supervisory visit with feedback: ……

Comments:

…….....

……

H. EVALUATE AND IMPROVE THE SYSTEM

1. Existence of the action plan for IDSR activities (check also the status of implementation):

Yes: ……No: …….

Comments:

…….....

……

2. Check the availability of the documents related to IDSR:

- Technical Guideline:

Yes: ……No: …….

Comments:

…….....

……

- Training Manual:

Yes: ……No: …….

Comments:

…….....

……

- Others: ……

Comments:

…….....

……

3. How often do you provide to your staff the information or training regarding the fight against epidemics? (Check the training report) ……

Comments:

…….....

……

I. SUMMARY OF THE SUPERVISION

Strengths:

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Weaknesses:

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Recommendations:

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Supervised staff:	**Supervisor:**	**Responsible of HC:**
Name and signature	**Name and signature**	**Name and signature**

APPENDIX 7.8: MONITORING CHART FOR USE OF INDICATORS

District: _____ Region/Province: _____

Year_____

Note: Please compute the actual percentage for each cell

Indicator	**Indicator results as a percentage**												
	Jan.	Feb.	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Proportion of health facilities submitting surveillance reports on time to the district													
Proportion of suspected outbreaks of epidemic prone diseases notified to the next higher level within 2 days of surpassing the alert threshold													
Proportion of cases of diseases targeted for elimination, eradication and any other diseases selected for case-based surveillance which were reported to the district using case-based or line-listing forms													

Proportion of reports of investigated outbreaks that included analyzed case-based data.													
Proportion of districts that have current trend analysis (line graphs) for selected priority diseases.													
Proportion of health facilities that have current trend analysis (line graphs) for selected priority diseases													
Proportion of outbreaks with laboratory results													
Proportion of confirmed outbreaks with recommended response													
Case fatality rate for each epidemic-prone disease (priority disease) reported													
Attack rate for each epidemic-prone disease reported													
(for national level)													

The number of epidemics detected at the national level and that were missed by the district level													
Have you calculated the indicators this month?													
If YES, have you used the results to take action correct any problems?													

SECTION 8: SUMMARY GUIDANCE AND INSTRUCTIONS FOR SURVEILLANCE

This section provides diseases instructions on how to:

- Take measures to respond to any suspected or confirmed outbreak
- Define goals and objectives of surveillance and the response for each priority disease
- Identify the data to analyze and interpret for each priority disease
- Prepare to use the district analysis workbook

This section presents summarized tables of references and instructions for each priority disease identified for the Rwanda's Integrated Disease Surveillance and Response program.

Priority disease or conditions for integrated disease surveillance

Background
In this section, you will find general information about: ▪ The disease or condition, the causative agent, geographic range affected and other epidemiologic information. ▪ Transmission routes such as person-to-person, unprotected contact with infectious body fluids or contaminated materials, vector-borne, and so on. ▪ Why the disease 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 and specific risk factors in Rwanda ▪ Any additional background information that might serve the district surveillance team.
Surveillance goal
This section states how the surveillance information is used for action.
Standard case definition

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

Probable case: A definition is provided for a suspected case with epidemiological link to a confirm case or an outbreak.

Confirmed case: A definition is provided for classifying a case as confirmed through laboratory diagnostic testing.

Respond to alert threshold

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

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

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

Respond to action threshold

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

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

Analyze and interpret data

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

laboratory confirmation
In this section guidelines on laboratory confirmation are provided including: relevant diagnostic test, how to collect, store and transport the specimens needed for laboratory confirmation, and information on the results of laboratory work.
Reference
Appropriate references for further information stated for each disease. Most are available from the WHO, US Centers for Disease Control and Prevention, and Rwanda MOH websites.

BLOODY DIARRHOEA (SHIGELLA)

Background
Shigella dysenteriae type 1 (SD1) is the most common cause of enteric infections and is transmitted from person-to-person through faecal-oral spread. Large scale outbreaks may be caused by Shigella dysenteriae 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.
Standard case definition
Suspected case: A person with diarrhoea with visible blood in stool. **Confirmed case**: Suspected case with stool culture positive for Shigella dysenteriae type1.
Respond to alert threshold

BLOODY DIARRHOEA (SHIGELLA)

If you observe that the number of cases or deaths is increasing over a period of time: - Report the increase to the next level of the health system (health centres to district hospitals and district hospitals to RBC/RBC/IHDPC EID). - Treat the suspected cases with oral rehydration and antibiotics based on recent susceptibility results, if available. - Obtain stool or rectal swab specimen for confirming the SD1 outbreak. - Investigate the case to determine risk factors contributing to transmission.
Respond to action threshold
If a suspected outbreak is confirmed: - Search for additional cases in locality of confirmed cases. - Strengthen case management and treatment. - Mobilize community to enable rapid case detection and treatment. - Identify high risk populations using person, place, and time data. - Reduce sporadic and outbreak-related cases by promoting hand-washing with soap or ash and water after defecating and before handling food. - Strengthening access to safe water supply and storage, and use of latrines and safe disposal of human waste.
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.
laboratory confirmation

Diagnostic test	Isolate Shigella dysenteriae type 1 (SD1) in culture to confirm shigella outbreak. If SD1 is confirmed, perform antibiotic sensitivity tests with appropriate drugs.
Specimen	Stool or rectal swab.

BLOODY DIARRHOEA (SHIGELLA)

When to collect the specimen	For each new area affected by the outbreak, a laboratory confirmation should be done. Collect sample when an outbreak is suspected. Collect stool from 5-10 patients who have bloody diarrhoea and Onset within last 4 days, and Before antibiotic treatment has started. Preferably, collect stool in a clean, dry container. Do not contaminate with urine. Sample stool with a swab, selecting portions of the specimen with blood or mucus. If stool cannot be collected, obtain a rectal swab sample with a clean, cotton swab.
How to prepare, store, and transport the specimen	- Place stool swab or rectal swab in Cary-Blair transport medium. - Transport to laboratory refrigerated. If Cary-Blair not available at laboratory, send sample to laboratory within 2 hours in a clean, dry container with a tightly-fitting cap. Specimens not preserved in Cary-Blair will have significant reduction of shigellae after 24 hours. If storage is required, hold specimens at 4°C to 8°C, and do not freeze
Results	- Culture results are usually available 2 to 4 days after receipt by the laboratory. - SD1 isolates should be characterized by antibiotic susceptibility. After confirmation of initial 5-10 cases in an outbreak, sample only a small number of cases until the outbreak ends, to monitor cessation of the outbreak, and antibiotic sensitivity patterns, which will guide the definitive treatment.
Reference	

BLOODY DIARRHOEA (SHIGELLA)

Guidelines for the control of epidemics due to Shigella dysenteriae type 1. WHO/CDR/95.4

Safe Water Systems for the Developing World: A Handbook for Implementing Household-based Water Treatment and Safe Storage Projects. Department of Health & Human Services. Centers for Disease Control and Prevention. Atlanta. 2000

" laboratory Methods for the Diagnosis of Epidemic Dysentery and Cholera". CDC/WHO, 1999 CDC, Atlanta, GA, USA

CHOLERA

Background

Acute illness with profuse watery diarrhoea caused by Vibrio cholerae sero-groups O1 or O139.

The disease is transmitted mainly through the faecal-oral route; that is through eating or drinking contaminated food or water.

Cholera causes over 100 000 deaths per year. It may produce rapidly progressive epidemics or worldwide pandemics. In endemic areas, sporadic cases (less than 5% of all non-outbreak-related diarrhoea cases) and small outbreaks may occur.

Incubation period is from a few hours to 5 days, usually in the range of from 2 to 3 days.

There has been a resurgence of cholera in Africa since the mid-1980s, where over 80% of the world's cases occurred in 1999. The majority of cases occurred from January through April.

Cholera may cause severe dehydration in only a few hours. In untreated patients with severe dehydration, the case fatality rate (CFR) may exceed 50%. If patients present at the health facility and correct treatment is received, the CFR is usually less than 1%. At least 90% of the cases are mild, and they remain undiagnosed.

Risk factors: eating or drinking contaminated foods such as uncooked seafood or shellfish from estuarine waters, lack of continuous access to safe water and food supplies, attending large gatherings of people including ceremonies such as weddings or funerals, contact with persons who died of cholera.

Other enteric diarrhoea may cause watery diarrhoea, especially in children less than 5 years of age.

Surveillance goal

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

Standard case definition

CHOLERA

Suspected 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

If a single case is suspected:

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

Respond to action threshold

If a suspected case is confirmed:

- Establish treatment centre in locality where cases occur.
- Treat cases onsite rather than asking patients to go to standing treatment centres elsewhere.
- Strengthen case management including treatment.
- Mobilize community early to enable rapid case detection and treatment.
- Survey the available 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

CHOLERA

Time: Graph weekly cases and deaths and construct an epidemic curve during outbreaks. Report case-based information immediately and summary information monthly for routine surveillance. **Place:** Plot the location of case households. **Person:** Count weekly total cases and deaths for sporadic cases and during outbreaks. Analyze distribution of cases by age and according to sources of drinking water. Assess risk factors to improve control of sporadic cases and outbreaks.	
laboratory confirmation	
Diagnostic test	- Isolate V. cholerae from stool culture and determine O1 serotype using polyvalent antisera for V. cholerae O1. - If desired, confirm identification with Inaba and Ogawa antisera. - If specimen is not serotypable, consider, V. cholerae O139 (see note in Results column)
Specimen	Liquid stool or rectal swab
When to collect the specimen	- For each new area affected by the outbreak, a laboratory confirmation should done. - Collect stool sample from the first suspected cholera case. If more than one suspected case, collect until specimens have been collected from 5 to 10 cases. Collect stool from patients fitting the case definition and Onset within last 5 days, and Before antibiotics treatment has started - Do not delay treatment of dehydrated patients. - Specimens may be collected after rehydration (ORS or IV therapy) has begun. - If possible, specimens should be collected from 5 – 10 suspected cases every 1 – 2 weeks to monitor cessation of the outbreak, changes in serotypes, and antibiotic sensitivity patterns of V.cholerae.

CHOLERA

How to prepare, store, and transport the specimen	- Place specimen (stool or rectal swab) in a clean, leak proof container and transport to laboratory within 2 hours. - If more than 2- hour delay is expected, place stool-soaked swab into Cary-Blair transport medium. - If Cary-Blair transport medium is not available and specimen will not reach the laboratory within 2 hours: Store at 4°C to 8°C - Do not allow specimen to dry. Add small amount of 0.85% NaCl if necessary - To transport, transport in well marked, leak proof container - Transport container in cold box at 4ºC to 8ºC
Results	- Cholera tests may not be routinely performed in all laboratories. - Culture results usually take 2 to 4 days after specimen arrives at the laboratory. Cary-Blair transport medium is stable and usually good for at least one year after preparation. It does not require refrigeration if kept sterile and in properly sealed container. If colour changes (medium turns yellow) or shrinks (depressed meniscus), do not use the medium. - The O139 serotype has not been reported in Africa and only in a few places in southwest Asia. - Serological determination of Ogawa or Inaba is not clinically required. It is also not required if polyvalent antisera results are clearly positive.
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 “ laboratory Methods for the Diagnosis of Epidemic Dysentery and Cholera.” CDC/WHO, 1999 CDC, Atlanta, GA, USA	

HAEMORRHAGIC FEVER

Background
Acute haemorrhagic fever syndromes can be attributable to Ebola and Marburg viral diseases (filoviridae); Lassa fever (arenaviridae), Rift Valley fever (RVF) and Crimean-Congo haemorrhagic fever (CCHF) (bunyaviridae); dengue (dengue haemorrhagic fever (DHF)) and yellow fever (flaviviridae); and other viral, bacterial or rickettsial diseases with potential to produce epidemics. All cases of acute viral haemorrhagic fever syndrome whether single or in clusters, should be immediately notified without waiting for the causal agent to be identified.
Surveillance goal
- Early detection of acute viral haemorrhagic fever syndrome cases and outbreaks, rapid investigation, and early laboratory verification of the aetiology of all suspected cases. - Investigation of all suspected cases with contact tracing. - During epidemics, most infected patients do not show haemorrhagic symptoms and a specific case definition according to the suspected or confirmed disease should be used (e.g. case definitions for Ebola-Marburg, CCHF, RVF, Lassa, DHF, and yellow fever).
Standard case definition
Suspected case: Acute onset of fever of less than 3 weeks duration in a severely ill patient AND any 2 of the following; haemorrhagic or purpuric rash; epistaxis (nose bleed); haematemesis (blood in vomit); haemoptysis (blood in sputum); blood in stool; other haemorrhagic symptoms and no known predisposing factors for haemorrhagic manifestations. **Confirmed case**: A suspected case with laboratory confirmation or epidemiologic link to confirmed cases or outbreak. **Note**: During an outbreak, case definitions may be changed to correspond to the local event.
Respond to alert threshold

HAEMORRHAGIC FEVER

<table>
<tr><td colspan="2">If a single case is suspected:
- Report case-based information immediately to the appropriate levels.
- Suspected cases should be isolated from other patients and strict barrier nursing techniques implemented. Standard precautions should be enhanced throughout the health care setting.
- Treat and manage the patient with supportive care.
- Collect specimen safely to confirm the case.
- Conduct case-contact follow-up and active case search for additional cases.</td></tr>
<tr><td colspan="2">Respond to action threshold</td></tr>
<tr><td colspan="2">If a single case is confirmed:
- Maintain strict VHF infection control practices* throughout the outbreak.
- Mobilize the community for early detection and care and conduct community education about how the disease is transmitted and how to implement infection control in the home care setting and during funerals.
- Conduct case-contact follow-up and active searches for additional cases that may not come to the health care setting.
- Request additional help from other levels as needed.
- Establish isolation ward to handle additional cases that may come to the health centre.</td></tr>
<tr><td colspan="2">Analyze and interpret data</td></tr>
<tr><td colspan="2">Person: Implement immediate case-based reporting of cases and deaths. Analyze age and sex distribution. Assess risk factors and plan disease control interventions accordingly.
Time: Graph cases and deaths daily/weekly. Construct an epidemic curve during the outbreak.
Place: Map locations of cases’ households and work sites.</td></tr>
<tr><td colspan="2">laboratory confirmation</td></tr>
<tr><td>Diagnostic test</td><td>- Presence of IgM antibodies against Ebola, Marburg, CCHF, Lassa or West Nile Fever
or
- Presence of Ebola in post-mortem skin necropsy</td></tr>
</table>

HAEMORRHAGIC FEVER

Specimen	- For ELISA: Whole blood, serum or plasma - For PCR: Whole blood or blood clot, serum/plasma or tissue - For immunohisto-chemistry: Skin or tissue specimens from fatal cases.
When to collect the specimen	- Collect specimen from the first suspected case. - If more than one suspected case, collect until specimens have been collected from 5 to10 suspected cases.
How to prepare, store, and transport the specimen	**Handle and transport specimens from suspected VHF patients with extreme caution. Wear protective clothing and use barrier precautions.** For ELISA or PCR: - Refrigerate serum or clot - Freeze (-20C or colder) tissue specimens for virus isolation For Immunohistochemistry: - Fix skin snip specimen in formalin. Specimen can be stored up to 6 weeks. The specimen is not infectious once it is in formalin. - Store at room temperature. Formalin-fixed specimens may be transported at room temperature.
Results	Diagnostic services for VHF are not routinely available. Advance arrangements are usually required for VHF diagnostic services. Contact the appropriate National authority or WHO.
Reference	

HAEMORRHAGIC FEVER

Interim Infection Control Recommendations for Care of Patients with Suspected or Confirmed Filovirus (Ebola, Marburg) Hemorrhagic Fever. BDP/EPR/WHO, Geneva March 2008.

Infection control for VHF in the African health care setting, WHO, 1998. WHO/EMC

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

WHO recommended Guidelines for Epidemic Preparedness and Response: Ebola Haemorrhagic Fever (EHF).WO/EMC/DIS/97.7.

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 Yor

INFLUENZA-LIKE ILLNESS (ILI)

Background
Respiratory infections are a significant cause of infectious disease morbidity and mortality in the world. The mortality rates are particularly high among infants, children and the elderly. However, the burden of disease is not well characterized in Africa. The most common pathogens causing respiratory infections are; Streptococcus pneumoniae, Haemophilus influenzae type b (Hib), Staphylococcus aureus and other bacterial species, Respiratory Syncytial Virus (RSV), measles virus, human parainfluenza viruses type 1, 2, and 3 (PIV-1, PIV-2 and PIV-3), influenza virus and varicella virus. An improved understanding of the epidemiology and seasonality of respiratory infections in Africa is essential for optimizing public health strategies for their prevention and control (e.g., vaccines and antivirals for prophylaxis and treatment, infection control). The threat of respiratory infections due to novel organisms that have epidemic or pandemic potential warrants special precautions and preparedness. Respiratory disease events that may constitute a public health emergency of international concern include; Severe Acute Respiratory Syndrome (SARS); human influenza caused by a new subtype, including human episodes of avian influenza; pneumonic plague; and novel agents that can cause large-scale SARI outbreaks with high morbidity and mortality. Surveillance for respiratory infections is based on the Influenza-like Illness (ILI) case definition. Laboratory-based surveillance or investigations using the ILI case definition is used to identify the disease causing pathogen.
Surveillance goals
- Early detection of unusual events that might indicate a shift in the severity or pattern of disease associated with influenza, or emergence of a new influenza strain. - Establish and monitor baseline rates of severe respiratory disease, including monitoring the severity and impact of influenza, - Describe and monitor vulnerable groups at highest risk of severe disease - Detection of antigenic or genetic changes in circulating viruses or the appearance of antiviral resistance.
Standard case definition

INFLUENZA-LIKE ILLNESS (ILI)

Influenza-like Illness: A person child or adult with: Sudden onset of fever > 38 ºC AND Cough or sore throat in the absence of other diagnoses.

A confirmed case of influenza is a case that meets the clinical case definition and is laboratory confirmed (laboratory results must be positive for influenza virus).

Respond to an alert threshold

If there is an unusual event (a cluster of deaths, for example) of respiratory infection, or if a single case of pandemic-prone acute respiratory disease is suspected:

- Unusual cases of influenza-like illness.
- Health-care workers with only occupational exposure risks develop ILI after providing care to patients with ILI.
- Two or more children and/or adults presenting with a respiratory infection or who died from a respiratory infection with onset of illness in a two-week period and in the same geographical area and/or are epidemiologically linked.
- Persons who have contact with birds/animals present with ILI;
- Any rumor of clusters of acute respiratory infections or of atypical respiratory infections

Respond to a suspected case of an epidemic- or pandemic-prone acute respiratory disease or to an usual event of severe acute respiratory infections:

- Report case-based information immediately to the appropriate levels.
- Practice infection control precautions for an acute respiratory disease with epidemic/pandemic potential (e.g., Standard plus Contact plus Droplet Precautions) immediately and enhance Standard Precautions throughout the health care setting.
- Treat and manage the patient according to national guidelines.
- Collect and transport laboratory specimens from case-patient and from symptomatic contacts and arrange for laboratory testing
- Review clinical history and exposure history during 7days before disease onset.
- Identify and follow-up close contacts of case-patient.
- Conduct active searches for additional cases.
- Conduct risk assessment to guide decision-making
- Public health measures related to international border and travel should be implemented under the framework of the international health regulations (2005)

INFLUENZA-LIKE ILLNESS (ILI)

Analyze and interpret data
Time: Graph cases and deaths weekly. Describe changes in the level of respiratoryactivity compared to the previous week.Construct an epidemic curve throughout the year and describe transmission patterns. **Person:** Characterize the illness in terms of clinical presentation, the spectrum of disease including severity of illness, count and report cases and deaths, the proportion of cases requiring hospitalization, clinical outcomes, case fatality ratio, attack rates by age/occupation/blood relation, laboratory confirmed cases. Describe the overall level of respiratory disease activity. Immediate case-based reporting of cases and deaths. During the outbreak, Analyze age and sex distribution. Assess risk factors immediately **Place:** Describe the degree of disruption of schools, health care infrastructure, workplace and point of entry (PoE). Ascertain whether any evidence exists that the virus may have increased it ability to cause human disease or improved its transmissibility. Also use trends of flu remedies and painkillers sales
laboratory confirmation
Further technical information on the role of laboratory can be found in the WHO guideline on sentinel surveillance of influenza viruses
Reference

INFLUENZA-LIKE ILLNESS (ILI)

World Health Organization – Acute Respiratory Infections
http://www.who.int/vaccine_research/diseases/ari/en/index.html
World Health Organization – Influenza resources
http://www.who.int/csr/disease/influenza/inforesources/en/index.html
World Health Organization – Influenza Fact Sheet
http://www.who.int/mediacentre/factsheets/2003/fs211/en/
World Health Organization - Interim guidelines on infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care, June 2007
http://www.who.int/csr/resources/publications/WHO_CD_EPR_2007_6/en/index.html
World Health Organization - Guidelines for investigation of human cases of avian influenza A (H5N1), January 2007.
http://www.who.int/csr/resources/publications/influenza/WHO_CDS_EPR_GIP_2006_4/en/index.html
World Health Organization - Collecting, preserving and shipping specimens for the diagnosis of avian influenza A (H5N1) virus infection. Guide for field operations, October 2006.
http://www.who.int/csr/resources/publications/surveillance/WHO_CDS_EPR_ARO_2006_1/en/index.h

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 skin patches and several nerve enlargements.
- Paucibacillary patients (PB) with one to five skin patches and a single nerve enlargement.

Leprosy control has improved greatly through use of WHO recommended multidrug therapy (MDT). 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 closest contacts of patients. Multibacillary patients are most contagious, but infectiousness is reduced rapidly as soon as multiple drug therapy begins. Leprosy can be complicated by neuritis and leprosy reactions, resulting in impairment and disabilities of hands, feet, and eyes. Leprosy has historically been associated with social isolation and psychosocial consequences. This social stigma still persists in some countries in Africa.

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.

LEPROSY

Standard case definition
Suspected case: A person showing one of three cardinal signs of leprosy: hypo-pigmented or reddish skin lesion, loss or decrease of sensations in skin patch, enlargement or peripheral nerve. ***Confirmed case*:** A person showing at least two cardinal signs of leprosy and who has not completed a full course of treatment with multidrug therapy (MDT).
Respond to alert threshold
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
If a suspected case is confirmed: - Examine patients for skin and nerve a sign at each contact patient has with a health worker to diagnose and care for leprosy reactions and impairments. - Examine risk factors for treatment interruption (for example, inadequate supplies of MDT in the health centre, poor accessibility of patients' villages, and so on). Give sufficient blister packs for a full course of treatment to patients unable to attend a health centre monthly. - Identify any fast increase or decrease of new cases during a period. Assess adequacy of surveillance in areas where under- or ever-reporting is suspected. Monitor distribution of MDT drugs.
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)

LEPROSY

laboratory confirmation
Routine laboratory confirmation for surveillance is not required.
Reference
Enhanced global Strategy for Further Reducing the Disease Burden due to Leprosy (SEA-GLP-2009.3) WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2

MALARIA

Background
Malaria is a highly prevalent tropical illness with fever following the bite of infected 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 vital organ 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 but is perennial in the rest of the region
Surveillance goal
Detect malaria epidemics promptly, especially in areas with seasonal epidemic transmission or with a large population at risk.
Standard case definition
Simple malaria: Any person with fever or history of fever within 24 hours; and with laboratory confirmation of diagnosis by malaria blood film or other diagnostic test for malaria parasites. **Severe malaria:** Any patient hospitalized with P. falciparum asexual parasitaemia as confirmed by laboratory tests with accompanying symptoms and signs of severe disease (vital organ dysfunction) diagnosed through laboratory.
Respond to alert threshold

LEPROSY

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 program 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 action threshold	
- 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 ITNs and IRS for all at risk of malaria.	
Analyze and interpret data	
Time: Graph the number of cases by month/week. Construct an epidemic curve during epidemics. **Place:** Plot location of households for new cases and deaths. **Person:** Count the number of new malaria cases and deaths by month and analyze age groups and time of onset.	
laboratory confirmation	
Diagnostic test	- Microscopy: Presence of malarial parasites in blood films for suspected cases - Malaria Rapid diagnostic test: Positive or negative test
Specimen	Blood: Usually finger-stick sample for all ages or other accepted method for collecting blood from very young children
When to collect	For blood smear: prepare blood film for all suspected cases admitted to inpatient facility, or according to national malaria case management guideline

LEPROSY

How to prepare, store, and transport	Blood smear: - Collect blood directly onto correctly cleaned and laboratoryeled microscope slides and prepare thick and thin smears. - Allow smears to dry thoroughly - Stain using the appropriate stain and technique - Store stained and thoroughly dried slides at room temperature out of direct sunlight. For rapid diagnostic test: - Collect specimen and perform test according to manufacturers' instructions
Results	Thick and thin smear results can be available the same day as preparation. - Microscopic examination of malarial slides may also reveal the presence of other blood-borne parasites. - RDT result is obtained immediately. Note: In the inpatient setting, perform a hemoglobin estimation laboratory test to confirm severe anaemia, in children 2 months to 5 years in age.
Reference	
Malaria epidemics: Detection and control, forecasting and prevention. Geneva. World Health Organization. WHO/MAL/98.1084 "Basic laboratory Methods in Medical Parasitology" WHO, Geneva, 1991	

MEASLES

Background
Measles is a febrile rash illness due to paramyxovirus (Morbillivirus) transmitted human-to-human via airborne droplet spread. It is the fourth leading cause of death in children less than 5 years of age in many African countries. The incubation period is 7 to 18 days from exposure to onset of fever. Among children with vitamin A deficiency and malnutrition, measles may result in severe illness due to the virus itself and associated bacterial infections, especially pneumonia; only the minority of cases are severe. Measles is among the most transmissible of human infections. Large outbreaks occur every few years in areas with low vaccine coverage and where there is an accumulation of persons who have never been infected or vaccinated. The true incidence of measles far exceeds reported cases. Risk factors include low vaccine coverage (<85 to 90%) which allows accumulation of susceptible persons at high risk for measles. Outbreaks can be explosive in areas of high population density. Other viral illnesses such as rubella may cause or contribute to similar outbreaks.
Surveillance goal
- Detect outbreaks of fever with rash illness promptly: - In countries with a measles elimination target: immediate case-based reporting of suspected cases and deaths of fever with rash illness; confirm all suspected measles cases with laboratory test (usually serum IgM). - In countries with accelerated measles control programs: Summary reporting of cases and deaths for routine surveillance and outbreaks; confirm the first five cases of suspected measles in a health facility per week with laboratory test (usually serum IgM)
Standard case definition

MEASLES

<table>
<tr><td colspan="2">Suspected case: Any person with fever and maculopapular (non-vesicular) generalized rash and cough, coryza or conjunctivitis (red eyes) or any person in whom a clinician suspects measles
Confirmed case: A suspected case with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an outbreak</td></tr>
<tr><td colspan="2">Respond to action threshold</td></tr>
<tr><td colspan="2">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.</td></tr>
<tr><td colspan="2">Analyze and interpret data</td></tr>
<tr><td colspan="2">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.</td></tr>
<tr><td colspan="2">laboratory confirmation</td></tr>
<tr><td>Diagnostic test</td><td>Presence of IgM antibodies to measles virus in serum.</td></tr>
<tr><td>Specimen</td><td>- Serum
- Whole blood</td></tr>
<tr><td>When to collect the specimen</td><td>- Collect specimens between the 3rd day of the rash and 28th day after onset of rash.
- Collect blood samples on 5 suspected measles cases when the number of cases exceeds the measles outbreak threshold (usually more than 5 cases in a district in a month).
In countries with an elimination target:
- Collect specimen from every suspected case of measles
- Collect serum for antibody testing at first opportunity or first visit to the health facility.</td></tr>
</table>

MEASLES

How to prepare, store, and transport the specimen	- For children, collect 1 to 5 ml of venous blood depending on size of child. Collect into a test tube, capillary tube or microtainer. - Separate blood cells from serum. - Let clot retract for 30 to 60 minutes at room temperature. Centrifuge at 2000 rpm for 10-20 minutes and pour off serum into a clean glass tube. If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clot retracts. - Pour off serum the next morning. If no centrifuge and no refrigerator, let blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle). - Pour off serum into a clean tube. - Store serum at 4°C. - Transport serum samples using appropriate packaging to prevent breaking or leaks during transport.
Results	The specimen should arrive at the laboratory within 3 days of being collected Results are usually available after 7 days. If as few as 2 out of 5 suspected measles cases are laboratory confirmed, the outbreak is confirmed. Avoid shaking of specimen before serum has been collected. To prevent bacterial overgrowth, ensure that the serum is poured into a clean glass test tube. The test tube does not need to be sterile, just clean. Transport the serum in an EPI hand vaccine carrier to 4ºC to 8ºC to prevent bacterial overgrowth (up to 7 days). If not refrigerated, serum stored in a clean tube will be good for at least 3 days.
Reference	

MEASLES

Using surveillance data and outbreak investigations to strengthen measles immunization programs, Geneva, World Health Organization. WHO/EPI/GEN/96.0

WHO Guidelines for Epidemic Preparedness and Response to Measles Outbreaks WHO/CDS/CSR/ISR/99.

MENINGOCOCCAL MENINGITIS

Background

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

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

Epidemics in the meningitis belt are traditionally associated with *Neisseria meningitides* serogroup A although in 2002 an epidemic due to Nm serogroup W135 occurred in Burkina and in 2006 Nm serogroup X was isolated in Niger.

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

Incubation period is 2 to 10 days.

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

Oily chloramphenicol is the drug of choice during epidemics because a single dose of this long-acting formulation has been shown to be effective. Antimicrobial resistance to chloramphenicol has not yet been detected in Africa; however, resistance to sulphonamides is widespread.

The current response to meningitis epidemics consists of reactive mass vaccination campaigns with bivalent (A and C) and/or trivalent polysaccharide vaccine (A, C, and W135) as soon as possible after an epidemic has been declared. Polysaccharide vaccines do not protect very young children and only provide protection for up to three years resulting in repetitive meningitis outbreaks.

A meningococcal A conjugate vaccine has been developed which is immunogenic in both infants and adults and is expected to confer long-term protection. It is expected that introduction of this conjugate vaccine into meningitis belt countries is likely to dramatically reduce the circulation of Nm A and eliminate Nm A epidemics.

MENINGOCOCCAL MENINGITIS

Surveillance goals

- To promptly detect meningitis outbreaks and to confirm aetiology of meningitis outbreaks.
- To use the data to plan for treatment and vaccination supplies and other prevention and control measures.
- To assess and monitor the spread and progress of the epidemic and the effectiveness of control measures.
- To monitor the situation including serogroup shifts throughout the year.
- To perform periodic susceptibility testing for penicillin and chloramphenicol.

Standard case definition

Suspected case: Any person with sudden onset of fever (>38.5ºC rectal or 38.0ºC axillary) and one of the following signs: neck stiffness, altered consciousness or other meningeal signs.

Confirmed case: A suspected case confirmed by isolation of *N. meningitidis* from CSF or blood.

Respond to alert threshold

Alert threshold:

- For populations between 30 000 and 100 000 inhabitants, an attack rate of 5 cases per 100 000 inhabitants per week.
- For populations less than 30 000 inhabitants, 2 cases in 1 week or an increase in the number compared to the same time in previous non-epidemic years.

Respond to alert threshold:

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

Respond to action threshold

MENINGOCOCCAL MENINGITIS

Epidemic threshold:

- For populations between 30 000 and 100,000: an attack rate of 15 cases per 100 000 inhabitants per week. When the risk of an epidemic is high (no epidemic during last 3 years, alert threshold reached in dry season), epidemic threshold is 10 cases per 100 000 inhabitants per week.
- For populations less than 30 000 inhabitants: 5 cases in 1 week or the doubling of the number of cases over a 3-week period.

Respond to epidemic threshold:

- Immediately vaccinate the epidemic district as well as any contiguous districts in alert phase.
- Mobilize community to permit early case detection and treatment, and improve vaccine coverage during mass vaccination campaigns for outbreak control.
- Continue data collection, transmission and analysis.
- Maintain regular collection of 5-10 CSF specimens per week throughout the epidemic season in all affected districts to detect possible serogroup shift.
- Treat all cases with appropriate antibiotics as recommended by National protocol.

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 and estimate distance to the nearest health facility.

Person: Count total sporadic and outbreak cases. Analyze age distribution.

Target case fatality rate: <10%

laboratory confirmation

Diagnostic test	- Microscopic examination of CSF for Gram negative diplococci - Culture and isolation of *N. meningitidis* from CSF

MENINGOCOCCAL MENINGITIS

Specimen	- 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.
When to collect the specimen	- Collect specimens from 5 to 10 cases once the alert or epidemic threshold (see "Meningitis" in Section 8.0) has been reached.
How to prepare, store, and transport the specimen	- Prepare the patient and aseptically collect CSF into sterile test tubes with tops. - Immediately place 1 ml of CSF into a pre-warmed bottle of trans-isolate medium. - Incubate at body temperature (36C to 37C). - Never refrigerate specimens that will be cultured. - Keep CSF for microscopic exam and chemistry in the original syringe (replace cap). - Refrigerate the capped syringe and send it to the laboratory as soon as possible.
Results	Isolation of *Neiseria meningitidis*, a fastidious organism, is expensive, and difficult. It requires excellent techniques for specimen collection and handling and expensive media and antisera. Initial specimens in an outbreak or for singly occurring isolates of *N. meningitis* should be serotyped and an antibiogram performed to ensure appropriate treatment. Trans Isolate medium (TI) is stable. If properly stored at temperature (4ºC) it can be kept for up to two years after preparation. In the refrigerator, the liquid phase turns gelatinous but reliquifies at room temperature. Unused TI bottles should be kept tightly sealed. If there is any colour change (yellowing or clouding of the liquid medium) or drying or shrinkage of the agar slant, the medium should not be used.
Reference	

MENINGOCOCCAL MENINGITIS

Weekly Epidemiological Record N 38, September 2000 (http://www.who.int/wer/pdf/2000/wer7538.pdf)

WHO Regional Office for Africa Standard Operating Procedures for Enhanced Meningitis Surveillance in Africa, August 2009

Control of epidemic meningococcal disease. WHO Practical Guidelines, 2nd Edition. WHO/EMC/BAC/98.3.

" laboratory Methods for the Diagnosis of Meningitis Caused by *Neisseria meningitidis, Streptococcus pneumoniae and Haemophilus influenzae.*" WHO document WHO/CDS/EDC/99.7 WHO, Geneva

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.
Standard 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
If a single case is suspected: - Report case-based information immediately to the next level. - Conduct an investigation to determine the risk for transmission - Treat and manage the case according to national recommendations, usually with supportive care and, if feasible, in intensive care. No routine isolation precautions are needed.
Respond to action threshold

NEONATAL TETANUS

If a case is confirmed through investigation: - Immunize the mother and other pregnant women in the same locality as the case with at least 2 doses of tetanus toxoid. - Conduct a supplemental immunization activity for women of childbearing age in the locality. - Improve routine vaccine coverage through EPI and maternal immunization program activities. - Educate birth attendants and women of childbearing age on the need for clean cord cutting and care. Increase the number of trained birth attendants.
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.
laboratory confirmation
laboratory confirmation is not required.
Reference
Field manual for neonatal tetanus elimination. Geneva, World Health Organization. WHO/V&B/99.14

ONCHOCERCIASIS

Background
Filarial infection of the skin and eye caused by Onchocerca volvulus transmitted by the bite of female Simulium black flies. Nearly all of the world's estimated 18 million infected persons (of whom more than 250 000 are blind) live within 26 African countries. Onchocerciasis is the second leading infectious cause of blindness worldwide. It causes debilitating skin problems, leading to significant decreases in productivity in areas where it is endemic. Entire villages have relocated away from the fertile lands near rivers where black flies breed. Incubation period is years to decades since repeated infection is necessary for disease manifestations. Clinical illness is unusual in children even in endemic areas. 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 Program). - Conduct periodic surveillance in sentinel villages: screen using diethylcarbamzaine (DEC); in case of a positive reaction to DEC, confirm with a microscopic examination of a skin biopsy from each suspected case.
Standard case definition
Suspected case: In an endemic area, any person with fibrous nodules in subcutaneous tissues **Confirmed case**: A suspected case that is laboratory confirmed by presence of one or more of the following: microfilariae in skin snips, adult worms in excised nodules, or typical ocular manifestations (such as slit-lamp observations of microfilariae in the cornea, the anterior chamber, or the vitreous body).
Respond to alert threshold

ONCHOCERCIASIS

<table>
<tr><td colspan="2">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.</td></tr>
<tr><td colspan="2">Respond to action threshold</td></tr>
<tr><td colspan="2">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.</td></tr>
<tr><td colspan="2">Analyze and interpret data</td></tr>
<tr><td colspan="2">Time: Graph cases quarterly.
Place: Plot distribution of patients’ household and workplaces
Person: Count quarterly cases and analyze age distribution</td></tr>
<tr><td colspan="2">laboratory confirmation</td></tr>
<tr><td>Diagnostic test</td><td>Microscopy.
laboratory criteria for confirmation: One or more of the following:
presence of microfilariae in skin snips taken from the iliac crest
presence of adult worms in excised nodules
presence of typical ocular manifestations, such as slit-lamp observations of microfilariae in the cornea, the anterior chamber, or the vitreous body</td></tr>
<tr><td>Specimen</td><td>Skin snips from:
- Nodule fluids
- Iliac crests
- Scapula area</td></tr>
<tr><td>When to collect</td><td>Take snips and nodule fluids from suspected cases 1hour after administration of Diethyl carbomazine</td></tr>
</table>

ONCHOCERCIASIS

How to prepare, store, and transport the specimen	Put the sample in a general container. Add a few drops of normal saline. Close it tightly before transporting it to the laboratory. Transported at ambient temperature.
Results	Result should be ready within 1 day.
Reference	
WHO Recommended Surveillance Standards. Second edition. WHO/CDS/CSR/ISR/99.2 WHO Recommended Surveillance Standards 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 septicaemic; 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 septicaemic 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 aetiology of all suspected non-outbreak-related cases and the first 5 to 10 outbreak-related cases.
Standard 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.

ONCHOCERCIASIS

Respond to alert threshold
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
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 harbourages) 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.
laboratory confirmation

Diagnostic test	- Isolation of Yersinia pestis from bubo aspirate or from culture of blood, CSF or sputum. - Identification of antibodies to the Y. pestis F1 antigen from serum.

ONCHOCERCIASIS

Specimen	- Aspirate of buboes, blood, CSF, sputum, tracheal washes or autopsy materials for culture - Blood for serological tests
When to collect the specimen	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. With buboes, a small amount of sterile saline (1-2 ml) may be injected into the bubo to obtain an adequate specimen If antibiotics have been started, plague can be confirmed by seroconversion (4-fold or greater rise in titer) to the F1 antigen by passive haemaglutination using pared sera. Serum should be drawn within 5 days of onset then again after 2-3 weeks.
How to prepare, store, and transport the specimen	Specimens should be collected using aseptic techniques. Materials for culture should be sent to the laboratory in Cary Blair transport media or frozen (preferably with dry ice (frozen CO2). Unpreserved specimens should reach the laboratory the same day. Liquid specimens (aspirates) should be absorbed with a sterile cotton swab and placed into Cary-Blair transport medium. Refrigerate. If transport will require 24 or more hours and Cary Blair transport is not available, freeze the specimen and transport it frozen with cool packs.
Results	Cultures should only be sent to a laboratory with known plague diagnostic capabilities or to a WHO Collaboratoryorating Centre 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.
Reference	

ONCHOCERCIASIS

Plague Manual: Epidemiology, Distribution, Surveillance and Control/ Manuel de la Peste: Epidémiologie, Répartition, Surveillance et Lutte. WHO/CDS/CSR/EDC/99.2

" laboratory Manual of Plague Diagnostic tests." CDC/WHO publication, 2000, Atlanta, GA

POLIOMYELITIS (ACUTE FLACCID PARALYSIS)

Background
Poliovirus (genus Enterovirus) serotypes 1, 2, and 3 are transmitted from person-to-person via faecal-oral spread. Incubation period is 7 to 14 days for paralytic cases and the range is approximately 3 to 35 days. The virus may be shed for several years by immuno-compromised persons. Infection is usually asymptomatic, but may cause a febrile syndrome with or without meningitis. In less than 5% of infections paralysis results, often of a single leg. Polio infection occurs almost exclusively among children. Infection may occur with any of 3 serotypes of Poliovirus. Immunity is serotype-specific and lifelong. Paralytic polio, though not fatal, has devastating social and economic consequences among affected individuals. The Polio Eradication Program has nearly halted ongoing wild-type polio transmission worldwide through use of oral poliovirus (OPV) vaccine. Globally, poliovirus type 2 appears to have been eliminated. Serotypes 1 and 3 polioviruses 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 neurological illnesses may cause AFP, for example, Guillain-Barré syndrome and transverse myelitis.
Surveillance goal
- Immediate case-based reporting of all poliomyelitis cases. Weekly summary reporting of cases for routine surveillance and outbreaks. - Detect cases of acute flaccid paralysis (AFP) and obtain laboratory confirmation of the aetiology of all suspected AFP cases. Obtain two or more stool specimens within 14 days of the onset of paralysis for viral isolation. - Surveillance for AFP is used to capture all true cases of paralytic poliomyelitis. Target for surveillance performance to provide certification of polio eradications is 1 case of AFP per year per 100 000 population aged less than 15 years.
Standard case definition

POLIOMYELITIS (ACUTE FLACCID PARALYSIS)

Suspected case: Any child under 15 years of age with acute flaccid paralysis or any person with paralytic illness at any age in whom the clinician suspects poliomyelitis.

Confirmed case: A suspected case with virus isolation in stool.

Respond to alert threshold

If a single case is suspected:

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

Respond to action threshold

If a case is confirmed:

If wild polio virus is isolated from stool specimen, refer to national polio eradication program guidelines for recommended response actions. The national level will decide which actions to take. They may include the following:

- Specify reasons for non-vaccination of each unvaccinated case and address the identified deficiencies.
- Immediately conduct “mopping-up” vaccination campaign around the vicinity of the case.
- Conduct surveys to identify areas of low OPV coverage during routine EPI activities, and improve routine vaccine coverage of OPV and other EPI antigens.
- Lead 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

POLIOMYELITIS (ACUTE FLACCID PARALYSIS)

<table>
<tr><td colspan="2">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.</td></tr>
<tr><td colspan="2">laboratory confirmation</td></tr>
<tr><td>Diagnostic test</td><td>Isolation of polio virus from stool</td></tr>
<tr><td>Specimen</td><td>Stool
Note: If no specimen is collected, re-evaluate patient after 60 days to confirm clinical diagnosis of polio (AFP).</td></tr>
<tr><td>When to collect the specimen</td><td>- 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.</td></tr>
<tr><td>How to prepare, store, and transport the specimen</td><td>- Place stool in clean, leak-proof container and laboratoryel clearly.
- Immediately place in refrigerator or cold box not used for storing vaccines or other medicines.
- Transport specimens so they will arrive at designated polio laboratory within 72 hours of collection
When there is a delay, and specimen will not be transported within 72 hours, freeze specimen at -20°C or colder. Then transport frozen specimen with dry ice or cold packs also frozen at -20°C or colder.</td></tr>
<tr><td>Results</td><td>Confirmed results are usually available within 21 after receipt of specimen by the laboratory.
If wild or vaccine derived polio virus is detected, the national program will plan appropriate response actions</td></tr>
<tr><td colspan="2">Reference</td></tr>
</table>

POLIOMYELITIS (ACUTE FLACCID PARALYSIS)

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

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

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

Supplement to the Manual for the virological investigation of Polio- WHO/EPI 2007

RABIES

Background
Rabies is a zoonotic disease (a disease that is transmitted to humans from animals) that is caused by a virus. Rabies infects domestic and wild animals, and is spread to people through close contact with infected saliva (via bites or scratches). The rabies virus infects the central nervous system, causing disease in the brain and, eventually, death. Early symptoms in people include: fever, headache, and general weakness or discomfort. As the disease progresses, symptoms include; insomnia, anxiety, confusion, slight or partial paralysis, excitation, hallucinations, increase in saliva, difficulty swallowing, and fear of water. In unvaccinated humans, rabies is almost always fatal if post-exposure prophylaxis is not administered before the onset of severe symptoms. Death usually occurs within days of the onset of neurological symptoms. Dogs are the main carrier of rabies in Africa and are responsible for most (approximately 97%) of the human rabies deaths worldwide. WHO estimates approximately 55,000 human deaths worldwide due to rabies each year; in Africa the annual death toll is 24,000. People most at risk of rabies live in rural areas, and children are at highest risk of dog rabies. About 30% to 60% of the victims of dog bites (the primary mode of virus transmission) are children less than 15 years of age. Children often play with animals and are less likely to report bites or scratches. Control of rabies in dog populations and access to human rabies post exposure prophylaxis can substantially reduce the burden of rabies in human populations Rapid and accurate laboratory diagnosis of rabies in humans and other animals is essential for timely administration of post-exposure prophylaxis. Within a few hours, a diagnostic laboratory can determine whether or not an animal is rabid and inform the responsible medical personnel.
Surveillance goal
Detect and respond promptly and appropriately to cases and outbreaks of rabies. Identify high-risk areas Estimation of disease burden

RABIES

Immediate reporting of cases and routine monthly summary reports	
Standard case definition	
Suspected: A person with one or more of the following: headache, neck pain, nausea, fever, fear of water, anxiety, agitation, abnormal tingling sensations or pain at the wound site, when contact with a rabid animal is suspected. **Confirmed:** A suspected case that is laboratory confirmed	
Recommended Public Health Action	
For a single case: - Post exposure prophylaxis to prevent rabies - Isolate patient if rabies develops to prevent infection of others - Immunize contacts if patient develops rabies - Vaccinate local dogs and cats to prevent outbreaks **General preventive measures:** - Promote public awareness of rabies - Target immunization campaign for domestic or wild animals in high-risk areas - Maintain active surveillance of rabies in animals	
Analyze and interpret data	
Time: Plot cases monthly. **Place:** Plot the location of case households and animal exposures. **Person:** Analyze distribution of cases by age, exposing animal, and circumstances of infection. Assess risk factors to improve control of cases	
laboratory confirmation	
Diagnostic test	- Detection of rabies viral antigens by direct fluorescent antibody (FA) in clinical specimens, preferably brain tissue (collected post mortem) - Detection by FA on skin or corneal smear (collected ante mortem) - FA positive after inoculation or brain tissue, saliva or CSF in cell culture, in mice or in suckling mice - Detectable rabies-neutralizing antibody titre in the CSF of an

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

RABIES

Reference
WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2 laboratory techniques in rabies, Fourth Edition, WHO, edited by F.-X. Meslin and all World Health Organization, Rabies Fact Sheet http://www.who.int/mediacentre/factsheets/fs099/en/ Council of State and Territorial Epidemiologists (CSTE). National Surveillance for Human Rabies. CSTE position statement 09-ID-70. Atlanta: CSTE; June 2009. Available from: http://www.cste.org. Centers for Disease Control and Prevention (CDC). Human Rabies Prevention — United States, 2008: Recommendations of the Advisory Committee on Immunization Practices. MMWR 2008; 57(RR03):1–26, 28. Available from: http://www.cdc.gov/mmwr/ Bleck TP, Rupprecht CE. Chapter 160 – Rhabdoviruses. In: Mandell GL, Bennett JE, Dolin R, editors. Principles and Practice of Infectious Diseases, 6th edition. Philadelphia: Churchill Livingstone; 2005.

SEVERE PNEUMONIA IN CHILDREN UNDER 5 YEARS OF AGE

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

SEVERE PNEUMONIA IN CHILDREN UNDER 5 YEARS OF AGE

- **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 alert threshold

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

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

Respond to action threshold

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

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

Analyze and interpret data

SEVERE PNEUMONIA IN CHILDREN UNDER 5 YEARS OF AGE

Time: Conduct month-to-month analysis for unexpected or unusual increases. Graph cases and deaths by month. Construct epidemic curve for outbreak cases. Plot month-to-month data and compare to previous periods. **Place:** Plot location of case households. **Person:** Count monthly pneumonia and severe pneumonia cases. Count pneumonia deaths. Analyze age distribution.
laboratory confirmation
Routine laboratory confirmation for surveillance is not required.
Reference
Integrated Management of Childhood Illnesses. World Health Organization. WHO/CDR/95.14.1

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.

Standard case definition

Suspected case:

- Early stage: a painful chancre originating as a papule and then evolving into a nodule at the primary fly bite site. There may be fever, intense headache, insomnia, painless lymphadenopathy, anaemia, local oedema and rash.
- Late stage: cachexia, somnolence, and central nervous system signs.

Confirmed case:

A suspected case confirmed by card agglutination trypanosomal test (CATT) or by isolation of trypanosomes in blood lymph nodes or cerebrospinal fluid.

Respond to alert threshold

TRYPANOSOMIASIS

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 action threshold	
If the number of cases or deaths increases to two times the number usually seen in a similar period in the past: - Assess prevention activities in the area around the cases and take action to improve them as indicated. - Conduct active case finding activities if it is an endemic area. - Conduct vector control activities specified by national guidelines.	
Analyze and interpret data	
Time: Graph quarterly cases. **Place:** Plot the distribution of case households. **Person:** Count monthly cases, and analyze age distribution.	
laboratory confirmation	
Diagnostic test	Presumptive: - Serological: card agglutination trypanosomiasis test (CATT) Confirmation: - Parasitological: detection (microscopy) of trypanosomes in blood, lymph nodes aspirates or CSF
Specimen	- Whole blood - Lymph nodes aspirates - Cerebrospinal fluid
When to collect the specimen	Suspects from endemic places with fever Any patient with fever and may have come into contact with tsetse flies.

TRYPANOSOMIASIS

How to prepare, store, and transport the specimen	For slides: Put the slides in a slide box and close properly. Store at room temperature in a dust-free place. In case there is no slide box, the slides can be wrapped in soft tissue paper (filter papers, serviettes, toilet paper, etc.) For blood in anticoagulant bottles, refer to reference laboratory.
Results	Results should be available the same day.
Reference	
Control and Surveillance of African Trypanosomiasis. Report of a WHO Expert Committee, Geneva, World Health Organization, 1998 (WHO Technical Report Series, No. 881). WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2	

YELLOW FEVER

Background
Acute viral hemorrhagic disease caused by a flavivirus transmitted human-to-human via the domestic species of Aedes mosquitoes (Urban epidemics) or to humans from primate reservoir via a forest mosquito species (Sylvatic cycle). Large scale outbreaks occur every 3 to 10 years in villages or cities in the absence of large scale immunisation. Sporadic cases can occur regularly in endemic areas. Resurgence of disease in Africa since mid-1980s. True incidence far exceeds reported cases. Incubation period 3 to 6 days after the bite from an infected mosquito. About 15% of infections progress to fever and jaundice. While only the minority of cases are severe, case fatality rate may be 25% to 50% among patients with syndrome of haemorrhage, jaundice, and renal disease. Risk factor: sporadic cases often linked to occupation or village location near woods or where monkeys are numerous. Also non-vaccinated persons. International reporting to WHO required within 24 hours. Viral hemorrhagic fevers (VHF) and other parasitic, viral, or bacterial diseases such as malaria, Dengue Chikungunya, leptospirosis, hepatitis A-E, Epstein-Barr virus, West Nile, Q fever, anthrax, rickettsial diseases, etc, and toxic exposures may mimic yellow fever. Infection and disease can be prevented by vaccination. With a vaccine efficacy > 95% and duration of immunity of at least 10 years.
Surveillance goal
- Seek confirmation of yellow fever and rule out other possible etiologies of fever with jaundice - Provide information in order to adopt appropriate control measures - Identify populations at risk of yellow fever - Monitor the epidemiology of the disease and the impact of control measures - Support operational research and innovation
Standard case definition

YELLOW FEVER

Suspected case: Any person with acute onset of fever, with jaundice appearing within 14 days of onset of the first symptoms.

Probable case: A suspected case

AND

One of the following

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

Confirmed case: A probable case

AND

One of the following

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

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

OR

One of the following

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

Isolation of the yellow fever virus

Respond to alert threshold

YELLOW FEVER

If a single case or cluster is suspected or probable: - Fill out notification form, including clinical information, case based forms, check vaccination status and travel history - Take blood specimen for laboratory confirmation. You may obtain convalescent specimen from patient(s), - Diagnose and treat patient(s) with supportive care. - Notify immediately to the next level. In the case of probable case inform nearby health units - Strengthen surveillance (apply the community case definition ie. fever and jaundice) - Initiate a preliminary field investigation if cluster of cases with fever and jaundice. Obtain information to determine probable site of infection. Determine vaccination coverage of the community and start planning for vaccination (in case of a cluster) - Strengthen routine yellow fever immunization
Respond to action threshold
In addition to alert threshold response If a single case is confirmed: - Continue / complete epidemiological investigation including screening for vaccination status - Initiate entomological investigation if indicated - Determine vaccination coverage in affected area (routine EPI, recent outbreak responses or preventive campaigns) - Initiate social mobilization for interventions selected - Continue risk communication and action to reduce risk including vector control if indicated - Initiate vaccination in affected villages, district or town/city based on epidemiological findings - Notify to WHO through Central Authorities using IHR decision instrument - Continue to strengthen routine yellow fever immunization, especially for hard-to-reach areas
Analyze and interpret data

YELLOW FEVER

Time: Generate Weekly Graphs of cases and deaths. During outbreaks, construct epidemic curves (to monitor daily then weekly trends). **Place:** Plot location of case households and occupation with precise mapping. **Person:** Report immediate case-based information for cases and deaths. Report summary totalsweekly. During outbreak, count cases and deaths daily as they occur, then weekly when the epidemic matures or ends. Analyze by person variables (age, sex, occupation…). Assess risk factors to improve prevention of sporadic outbreaks	
laboratory confirmation	
Diagnostic test	- ELISA for the presence of yellow fever Specific IgM and IgG antibodies. - Exclusion of Dengue, West Nile virus and other locally prevalent flavivirus will be necessary for the confirmation of yellow fever. - PCR, YF specific seroneutralization, virus isolation or histopathology
Specimen	Serum in the acute and convalescent phases of the illness; In the event of death, postmortem liver specimen
When to collect the specimen	Within 14 days of onset of first symptoms - Collect specimen from at least the first to 10^{th} suspected cases of yellow fever. - Collect specimen from last cases (based on epidemic curves) to decide on the end of the epidemic.

YELLOW FEVER

How to prepare, store, and transport the specimen	- Collect 10 ml of venous blood from adults, 1-5 ml from children, in a capillary tube, microtainer, or if necessary in a standard glass test tube. - Separate blood cells from serum: o Let clot retract for 30 to 60 minutes at room temperature. Centrifuge at 2000 rpm for 10-20 minutes and pour off serum into a clean glass tube. o If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clot retracts. Pour off serum the next morning. o If no centrifuge and no refrigerator, let blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle. Pour off serum into a clean tube. - Store serum at 4°C. - Transport serum samples using appropriate packaging to prevent breaking or leaks during transport. Avoid glass tubes for shipment and transport if possible. - The specimen should arrive at the laboratory within 3 days of being collected. - Avoid shaking of specimen before serum has been collected. - To prevent bacterial overgrowth, ensure that the serum is poured into a clean glass test tube. The test tube does not need to be sterile – just clean. - Transport the serum in an EPI hand vaccine carrier at 4°C-8°C to prevent bacterial overgrowth (up to 7 days). If not refrigerated, serum stored in a clean tube will be good for at least 3 days
Results	laboratory results should be received within 7 days of reception of the specimen in the laboratory.
Reference	

YELLOW FEVER

District guidelines for yellow fever surveillance. WHO 1998 WHO/GPVI/EPI/98.09
Yellow Fever. 1998. WHO/EPI/Gen/98.11
Recommendation of Expert Meeting on Yellow Fever Surveillance and Response in Africa. Brazzaville, Congo, from 13 to 15 October 2010

TYPHOID FEVER

Background
Typhoid fever is a bacterial disease, caused by Salmonella typhi. Symptoms usually develop 1–3 weeks after exposure, and may be mild or severe. They include high fever, malaise, headache, constipation or diarrhoea, rose-coloured spots on the chest, and enlarged spleen and liver. Healthy carrier state may follow acute illness. Typhoid fever remains a serious public health problem throughout the world, with an estimated 16–33 million cases and 500 000 to 600 000 deaths annually. In the last outbreak in the Democratic Republic of Congo, between 27 September 2004 and early January 2005, no less than 42 564 cases of typhoid fever were reported, including 214 deaths and 696 cases of peritonitis and intestinal perforations In virtually all endemic areas, the incidence of typhoid fever is highest in children from 5–19 years old. The disease is almost exclusively transmitted by food and water contaminated by the faeces and urine of patients and carriers. Polluted water is the most common source of typhoid transmission. In addition, shellfish taken from sewage-contaminated beds, vegetables fertilized with night-soil and eaten raw, contaminated milk and milk products have been shown to be a source of infection. Typhoid fever has been virtually eliminated in most areas of the industrialized world with the advent of proper sanitary facilities. Most cases in developed countries are imported from endemic countries. People can transmit the disease as long as the bacteria remain in their body; most people are infectious prior to and during the first week of convalescence, but 10% of untreated patients will discharge bacteria for up to 3 months. Typhoid fever can be treated with antibiotics. However, resistance to common antimicrobials is widespread. Healthy carriers should be excluded from handling food.
Surveillance goal
- Detect Typhoid Fever sporadic cases and outbreaks promptly, and seek laboratory verification - Identify areas/population at high risk in order to improve prevention of the disease by taking hygienic measures
Standard case definitions

TYPHOID FEVER

Suspected case: Any person with gradual onset of steadily increasing and then persistently high fever, chills, malaise, headache, sore throat, cough, and, sometimes, abdominal pain and constipation or diarrhoea. ***Confirmed case:*** Suspected case confirmed by isolation of *Salmonella typhi* from blood, bone marrow, bowel fluid or stool.
Respond to alert threshold
If Typhoid fever cases are suspected: - Arrange for laboratory testing of stool specimens or rectal swabs of suspected cases, especially in situations where food or waterborne transmission is suspected. - Report and investigate all suspected outbreaks of typhoid. Search for case/carrier that is the source of infection and for the vehicle (water or food) through which infection is being transmitted. - Treat typhoid fever patients with antibiotics. Severe cases should be provided supportive measures such as oral or intravenous hydration, the use of antipyretics, and appropriate nutrition.
Respond to action threshold
If Typhoid Fever cases are confirmed - Identify areas/populations at high risk to identify source(s) and mode(s) of transmission in order to prevent and control the disease. - Conduct health education programmes on hygiene with simple messages on safe water, safe food handling practices, hygiene and handwashing. - Support provision of clean water and proper sanitation to affected population(s). Chlorinate suspected water supplies. All drinking water should be chlorinated or boiled before use. - More than 90% of patients can be managed at home with oral antibiotics, reliable care and close medical follow-up for complications or failure to respond to therapy. Patients with persistent vomiting, severe diarrhoea and abdominal distension may require hospitalization and parenteral antibiotic therapy.
Analyze and interpret data

TYPHOID FEVER

Time: Graph cases and deaths weekly. Construct an epidemic curve during outbreaks. **Place:** Plot location of case households with precise mapping. **Person:** Report immediate case-based information for cases and deaths. Report summary totals monthly. During outbreak, count cases and deaths weekly. Analyze by age. Assess risk factors to improve prevention of outbreaks.	
laboratory confirmation	
Diagnostic test	Culture: Isolation of *salmonella spp.* from stool or blood of a patient The WIDAL Test should not be used for diagnostic purpose
Specimen	- Blood - Stool
When to collect	Collected samples preferably before antibiotics are administrate
How to prepare, store, and transport	5-10 ml of blood distributed in a blood culture bottle. Stool in stool container Store specimens at 4-8 C or ambient temperature away from heat and direct sunlight.
Results	Blood culture 4 days to 2 weeks Stool 3-4 days.
Reference	
▪ The diagnosis, Treatment and Prevention of Typhoid Fever; WHO/V&B/03.07 ▪ Weekly Epidemiological Record; N° 1, 2005, 80, 1-8; http//www.who.int/wer ▪ WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2	

TYPHUS EPIDEMIC

Background
The causal agent of the exanthematic typhus is **Rickettsia prowazekie.** A sick person serves as a reservoir for the virus and is also responsible for maintaining the infection during the inter-epidemic phase. Factors that promote the transmission of this virus include poor body and cloth hygiene, overcrowding, hunger and war. Transmission of the disease: when a body louse is feeding on the blood of a patient it is infected after then it produces stool that contains rickettsia, mainly during the next blood meal on healthy people. These people, through scraping, are going to burst the waste and lice and in the process infect themselves. Inhalation of dust containing faeces from infected lice is also indicated as the cause of certain infections. Everybody is susceptible to the infection and the disease provides long-term immunity
The objectives of the surveillance
Timely detection of typhus cases
Recommended definition of the case
Any patient with sudden start of fever, shiver, headaches, widespread pains, prostration. Eruption stretching out progressively to the trunk and limbs on the face, palms and the sole of the feet sometimes go along with cutaneous petechiae and bleeding.
Responding to a suspected epidemic and other important diseases of major public health concern
- Alert threshold: The increase of fever cases from unknown cause arising among land locked population with poor hygiene. Response to the alert threshold - To spray powder insecticide with persistent effect on regular intervals, the same will be done by hand on the body or powdering clothes and bedding; - To promote personal, clothing and collective good hygiene; - Prophylactic treatment of vulnerable groups by spraying the insecticide with persistent effect; Any suspected case should be put under surveillance for 14 maximum days. - Threshold effect: 1 typhus case confirmed. Response to the threshold effect When the diagnosis is suspected, the treatment should rapidly be administered. Medicines like tetracycline, doxycyclines are recommended and when they are not available

use chloramphenicol.
Data analysis and interpretation
Depending on the person: We have to be keen on the age, sex Depending on the area : The home address to locate the source of infection

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 mosquitoes (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 aetiology.

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 aetiology 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 epidemic 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 centre.

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

DIARRHEA WITH DEHYDRATION IN CHILDREN LESS THAN 5 YEARS OF AGE

Background

- Diarrhea with dehydration in children less than 5 years of age is due to infections of the gastrointestinal tract caused by viruses (especially Rotavirus), bacteria *(E. Coli, Salmonellae, shigellae, Campylobacter, Yersinia*, and others), and parasites (*Giardia, Entamoeba*, cryptosporidia, cyclospora). These diseases are transmitted through eating contaminated food or water, or through fecal-oral route.
- Diarrhea 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. It is among the top ten diseases in Uganda.
- 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 quickly classify levels of dehydration, rehydrate appropriately and refer where there is need. This reduces morbidity and mortality of childhood diarrhea

Surveillance goal

- Monitor trends in dehydration cases and diarrhea deaths, with the expectation of declining trends due to high-quality IMCI and public health measures

Recommended case definition

Case with Some dehydration: Passage of 3 or more loose or watery stools in a day with two or more of the following signs: restlessness, irritability; sunken eyes; thirsty; skin pinch goes back slowly.

Case with Severe dehydration: Passage of 3 or more loose or watery stools in a day with two or more of the following signs: lethargy or unconsciousness; very sunken dry eyes; not able to drink or drinking poorly; skin pinch goes back very slowly.

Respond to unexpected trends/epidemiology for non-outbreak diseases

If severe dehydration of cases and deaths are not declining over time:

- Report the problem to the next level.
- Investigate the cause for the lack of decline and identify the problem.
- Make sure that cases are managed according to IMCI guidelines.

- Encourage home-based therapy with oral rehydration.

Respond to a lack of decline in cases/deaths due to inadequate public health activities (for non-epidemic prone diseases)

If the investigation confirms lack of decline due to inadequate public health activities:

- Assess health worker practice of IMCI guidelines for managing cases and improve performance for classifying diarrhea 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, maintain safe water chain and preparation of foods.
- Teach mothers and communities about early referral for dehydration and danger signs
- Work with district and community partners on improving IMCI services and improving food and water sanitation in the district

Analyze and interpret data

Time: Graph cases and deaths monthly to compare with same period in previous years. Prepare graphs for outpatient diarrhea with some dehydration and for diarrhea with severe dehydration.

Person: Compare ratios of some dehydration cases with severe dehydration cases and deaths. Examine in-patient case fatality ratios.

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

GLOSSARY

Alert

It is used in the context of alert to the epidemic; it is a kind of declaration addressed to the health officials about an impending epidemic especially when the epidemic is beyond the expected level. In the event of alert to the epidemic, all necessary measures to conduct a thorough investigation for a rapid response should be taken.

Cause

Agent, factor, event or circumstance that is at the root of a disease, health problem or any other complicated situation.

Epidemic curve

A chart (curve) highlighting the distribution of detected cases during an epidemic depending on period of its outbreak.

Case definition

A set of standardised criteria applied to identify the individuals with a given disease or any other condition under investigation (cases). Defining a case may require clinical, biological, epidemiological criteria single or associated, probable or confirmed.

Effectiveness

The extent to which a plan, a program, an intervention or a response achieves the defined objective for which it was initiated

Efficiency

The extent to which an objective has been achieved depending on resources, effort made to implement a plan, a program, an intervention or a response.

Endemic

The long lasting presence of a disease or an infectious agent within population or a well specified geographical area

Epidemic

An outbreak or sudden occurrence of a disease or health-related events within a community In operational terms, there is an epidemic whenever the epidemic threshold is beyond the expected level.

Evaluation

A systematic process to determine the relevance, efficiency and the impact of programs, interventions and responses in relation to the objectives set at the beginning.

Graph

Curve, map or chart highlighting the data distribution of one or more variables according to person, location and period.

Incidence

Number of new cases or out breaking events within a given population for a given period

Intervention

Program or a set of interventions implemented in order to address a problem or changing an unpleasant situation.

Morbidity

A deviation from to good health condition

Notification

Compulsory communication to the health official of cases and deaths caused by communicable disease or diseases of public health importance

Population at risk

A population at risk is defined as a group of vulnerable people and susceptible to contract a disease or condition. This is also referred to as threatened or vulnerable population.

Targeted population

A subgroup of population also defined also as beneficiary/targeted by an intervention or a given service.

Prevalence

Frequency of a given characteristic or disease within population at a particular time (Instantaneous prevalence) or during a given period of time (Periodical prevalence)

Case management

A set of interventions aimed at caring for affected individuals by a particular disease

Diagram of the process of IDSR