Technical Guidelines for Integrated Disease Surveillance and Response in Nigeria

March, 2013

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1st Edition 2002

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2nd Edition 2009

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Acknowledgments

The following individuals provided technical contributions during the adaptation and validation of the reviewed 2nd edition 2010 technical guidelines for IDSR and are gratefully acknowledged.

Abbreviations

AFP	Acute flaccid paralysis
ARI	Acute respiratory infection
AEFI	Adverse events following immunization
AFRO	WHO Regional Office for Africa
BU	Buruli ulcer
CFR	Case fatality rate
CDC	Centers for Disease Control and Prevention
CCHF	Crimean-Congo hemorrhagic fever
DHF	Dengue haemorrhagic fever
DSS	Dengue shock syndrome
DRRT	District epidemic rapid response team
DHMT	District Health Management Team
EHF	Ebola haemorrhagic fever
EPR	Epidemic and Pandemic Alert and Response
EPI	Expanded Program on Immunizations
XDR-TB	Extensively drug resistant tuberculosis
Hib	*Haemophilus influenzae* type b
HAV	Hepatitis A Virus
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HDV	Hepatitis D Virus
HMIS	Health management information system
HSV	Herpes simplex virus
HEV	Hepatitis E Virus
HBP	High blood pressure
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
PIV	Human parainfluenza virus
IPC	Infection Prevention and Control
ILI	Influenza-like Illness

Abbreviations

ITN	Insecticide treated nets
IDS	Integrated Disease Surveillance
IDSR	Integrated Disease Surveillance and Response
IMCI	Integrated Management of Childhood Illness
IHR	International Health Regulations
LBW	Low birth weight
LF	Lymphatic filariasis
MUAC	Middle upper arm circumference
MDR-TB	Multi drug resistant tuberculosis
Nm	Neisseria meningitides
NNT	Neo-natal tetanus
NCD	Non-communicable disease
PPE	Personal protective equipment
PoE	Point of Entry
PHEIC	Public health emergencies of international concern
PHEMC	Public health emergency management committees
PHENC	Public health event of national concern
RRT	Rapid response team
RVF	Rift Valley Fever
SARI	Severe Acute Respiratory Infection
SARS	Severe Acute Respiratory Syndrome
STI	Sexually transmitted infection
TB	Tuberculosis
USAID	United States Agency for International Development
VHF	Viral haemorrhagic fever
WNV	West Nile Virus
WHO	World Health Organization

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Foreword

Communicable diseases are the most common causes of death, illness and disability in most developing countries. These include malaria, measles, cerebrospinal meningitis, cholera, yellow fever, Lassa fever, Tuberculosis, HIV/AIDS, diarrhea and Pneumonia etc. The federal ministry of health has developed programmes for the elimination, eradication, prevention and control of these diseases with technical support from development partners.

The resultant effect of poor surveillance system is poor control measures which results in high mortality, morbidity and disability which were characterize by the initial Disease Surveillance and Notification system (DSN) in the country before the introduction of the present integrated disease surveillance and Response (IDSR) strategy. The World Health Regional Committees for Africa advocated IDSR in 1998 at its 48th session. The aim of this strategy is to integrate multiple surveillance system so that human and other resources can be used more efficiently and effectively.

Due to some gaps identified in the present IDSR strategy, the WHO 2008 advocated for a review of the system and came up with the first generic version of the revised national technical guidelines on integrated disease surveillance and Response which was adapted by all countries in the African region including Nigeria. Te reviewed generic version included some non-communicable diseases and the incorporation of the International Health regulations (IHR) 2005 into the national surveillance systems.

The first edition of IDSR Technical Guidelines (2002) was adopted and adapted by Nigeria, in this regard tremendous progress has been made towards coordinated, and integrated surveillance system in the country. Capacities have also been built across all the levels to dictate, confirm and responds to public health treats.

The second of the IDSR Technical Guidelines was developed in response to several factors relevant to the last decade. During the last ten years, many changes have occurred in Africa's health, social, economic, environmental and technical environment. Between 2000 and 2010, the emergence of new diseases, conditions and events resulted in the need to review the recommendations for evolving public health priorities for surveillance and response. These changes were also evident in Nigeria. Therefore, experts were invited from the academia, Tertiary and Specialist Hospitals, States Ministry of Health, LGAs, Health programmes within the Federal Ministry of Health and development partners to carry out a thorough review and validation of the second edition of the IDSR technical guidelines. This reviewed document also went through series of editing which gave birth to all encompassing document for disease surveillance and Response

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Hon. Minister of Health

Introduction

Nigeria is situated in the West African sub region. Administratively, the country is divided into thirty-six States and one Federal Capital Territory (FCT) Abuja. There are 774 Local Government Areas (LGAs) which is the lowest administrative level.

The 2006 National Population Census estimated the Nigerian population at 140 million, with an annual growth rate of 3.2%. In 2000, the World Health Organization ranked Nigeria's overall health system performance as 187th among 191 member states. The health indicators for Nigeria are currently worse than the average for sub Saharan Africa; for example, infant mortality rate (IMR) is 78 out of 1000, under 5 years mortality rate is 147 out of 1000, and the maternal mortality rate (MMR) is 640 out of 100,000. [1]

Diseases such as Malaria, Diarrheal diseases, Acute respiratory infections, and vaccine preventable diseases account for at least 90% of childhood morbidity and mortality and other childhood health problems in Nigeria. Other diseases like Lassa fever, Cerebrospinal Meningitis (CSM) and Measles continue to occur with increased frequency in epidemic proportion and produce highest case fatality rate. Nigeria, like all other countries in the region, is affected by the HIV/AIDS pandemic with a national prevalence rate of 4.4% (2005). In 2006, the country experienced outbreak of highly pathogenic Avian Influenza (H5N1) in poultry and in 2007, a human case was recorded.

In September 1998, the 48th World Health Organization Regional Committee for Africa met in Harare, Zimbabwe. Through resolution AFRO/RC48/R2, Member States adopted integrated disease surveillance as a regional strategy for strengthening weak national surveillance systems in the African region. Until 2008, the diseases under the Integrated Disease Surveillance and Response (IDSR) were mainly those diseases that are targeted for eradication, elimination, epidemic prone diseases and some communicable diseases of public health importance.

With the epidemiologic transition, non communicable diseases are now contributing a significant burden of morbidity and mortality in Africa. Nigeria, like other developing countries, is facing a double burden of both infectious communicable diseases and Non-Communicable Diseases (NCDs). This guideline was revised to include non-communicable diseases that are of public health importance (e.g. Diabetes mellitus, High blood pressure), Neglected Tropical Diseases (Noma, Buruli ulcer), emerging infectious diseases such as H5N1 and SARS, and other diseases under International Health Regulations (IHR).

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[1] World Health Organization, 2011

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

The availability of accurate, up-to-date, reliable, and relevant health data and information is essential for strengthening and managing the health system. Currently, there is paucity of relevant health data for policy decision and planning. The implementation of the health reform agenda, including strategies and action plans, is hampered by the dearth of reliable data on health parameters at all levels of the health system. When information flow exists, it has remained exclusively vertical, from the periphery to the center, with little feedback. [1]

What is Disease Surveillance?

Surveillance is the ongoing systematic collection, analysis, and interpretation of health data. It includes the timely dissemination of the resulting information to those who need them for action. Surveillance is also essential for planning, implementation, and evaluation of public health practice. Data collected at health facility level is compiled and sent to the next level and regular feedback is shared with the lower level. A standard case definition is used to identify such priority diseases or events and the laboratory is recognized as an important component of public health surveillance.

Several types of surveillance are used in national programs. The choice of method depends on the purpose of the surveillance action. In general, types of surveillance methods describe:

- Focused location for surveillance (such as health facility-based surveillance or community-based surveillance).
- Designated or representative health facility or reporting site for early warning of epidemic or pandemic events (sentinel surveillance).
- Surveillance conducted at laboratories for detecting events or trends not necessarily evident at other sites.
- Disease-specific surveillance involving activities aimed at targeted health data for a specific disease.

Regardless of the type of surveillance, the important issue is that the health data is used for public health action.

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[1] Nigerian Health Review, 2006

What is Integrated Disease Surveillance and Response?

The IDSR is a strategy and a tool to promote rational use of resources by integrating and streamlining common surveillance activities.   Many intervention programs still rely on their own disease surveillance systems. Each program has made efforts through the years to improve its ability to obtain reliable data on time in order to use information for taking action.

Disease control and prevention objectives are successfully met when resources are dedicated to improving the ability of health officials to detect the targeted diseases, obtain laboratory confirmation of the disease, and use thresholds to initiate action at the LGA level. Building on these successes, the World Health Organization (WHO) Regional Office for Africa (AFRO) proposes an Integrated Disease Surveillance and Response (IDSR) strategy for improving disease surveillance in Nigeria linking community, health facility, LGA, State and National levels.

Additionally, IDSR takes into account the *One World-One Health* perspective *which* is a strategy that addresses events at the intersection of human, domestic animal, wildlife, and the environment. For example, 75% of recently emerging and re-emerging diseases affecting human health are of animal origin (HIV/AIDS, avian influenza etc).

One World-One Health is an interdisciplinary, holistic and integrated approach to health. Diseases and other threats resulting from climate change, food safety, and chemical hazards constitute a complex set of challenging events involving human, animal and environmental health.   The *One World-One Health* strategy promotes the integration and coordination within and across sectors for disease surveillance, outbreak investigation and response activities undertaken by professionals from various fields. It is a strategy that ensures the strengthening of each sector and enhances inter-sectoral linkages. This facilitates efficient utilization of scarce resources, effective and prompts leveraging of various sectors capabilities for a better disease prevention and control.

In an integrated system:

- The LGA level is the focus for integrating surveillance functions. This is because the LGA is the first level in the health system with full-time staff dedicated to all aspects of public health such as monitoring health events in the community, mobilizing community action, encouraging national assistance and accessing regional resources to protect the LGA's health.
- All surveillance activities are coordinated and streamlined. Rather than using scarce resources to maintain separate vertical activities, resources are combined to collect information from a single focal point at each level.

- Several activities are combined into one integrated activity and take advantage of similar surveillance functions, skills, resources and target populations. For example, surveillance activities for acute flaccid paralysis (AFP) can address surveillance needs for neonatal tetanus, measles and other diseases. Thus, health workers who routinely monitor AFP cases can also review LGA and health facility records for information about other priority diseases.

- Surveillance focal points at the LGA, state and national levels collaborate with epidemic response committees at each level to plan relevant public health response actions and actively seek opportunities for combining resources.

Integration refers to harmonizing different methods, software, data collection forms, standards and case definitions in order to prevent inconsistent information and maximize efforts among all disease prevention and control programmes and stakeholders. Training and supervision are integrated, a common feedback bulletin is used, and other resources such as computers and vehicles are shared. IDSR involves nearly full time coordination of surveillance activities and joint action (planning, implementation, monitoring, evaluation) whenever it is possible and useful.

Coordination refers to *working or acting together effectively* for the rational and efficient use of available but limited resources such as Health Management Information System (HMIS) and various disease programs. Coordination involves information sharing, joint planning, monitoring and evaluation in order to provide accurate, consistent and relevant data and information to policy-makers and stakeholders at LGA, state and national levels.

Goal and objectives of integrated disease surveillance and response

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

The general objective of the IDSR strategy is to provide a rational basis for decision-making and implementation of public health interventions that are efficacious in responding to priority diseases and events.

The specific objectives of IDSR are to:

- Strengthen the capacity *to conduct effective surveillance activities*: train personnel at all levels; develop and carry out plans of action; and advocate and mobilize resources.

- Integrate multiple surveillance *systems* so that forms, personnel and resources can be used more efficiently.
- *Improve the use of information* to detect changes in time in order to conduct a rapid response to suspect epidemics and outbreaks; monitor the impact of interventions: for example, declining incidence, spread, case fatality, and to ffacilitate evidence-based response to public health events; health policy design; planning; and management
- *Improve the flow of surveillance information* between and within levels of the health system.
- *Strengthen laboratory capacity and involvement* in confirmation of pathogens and monitoring of drug sensitivity.
- *Increase involvement of clinicians* in the surveillance system.
- *Emphasize community participation* in detection and response to public health problems including event based surveillance and response in line with IHR
- *Trigger epidemiological investigations* in detection, investigation and reporting of public health problems, and in the implementation of effective public health interventions.

IDSR and IHR (2005)

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

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

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

IDSR provides a template for the implementation of IHR through the following:

- An infrastructure and resources for surveillance, investigation, confirmation, reporting and response
- Experienced human resources
- Defined implementation process (sensitization, assessment, plan of action, implementation, monitoring and evaluation)
- Generic guides for assessment; Plan of action development; Technical guidelines; training materials; tools and Standard Operating Procedures that incorporate IHR components.

Thus, IDSR is a system with the potential to ensure a reliable supply of information to the national level in order to fulfill IHR requirements. The IHR provide an opportunity to address the threat to international public health security and trade caused by reemerging and emerging infectious diseases including public health emergencies of international concern (PHEIC). They also provide an excellent opportunity to strengthen surveillance and response systems, and to act as a potent driver for IDSR implementation.

Importantly, Member States including Nigeria in the African Region recommended that IHR (2005) should be implemented in the context of IDSR. IHR is a binding and legal instrument. It calls for strengthening of national capacity for surveillance and control, including sites such as points of entry (i.e. ports, airports and ground crossings); prevention, alert and response to international public health emergencies; global partnerships and international collaboration; and highlights rights, obligations, procedures and monitoring of progress. Through IDSR, Nigeria is developing capacities for surveillance, laboratory confirmation, notification and response to outbreak.

SURVEILLANCE DATA FLOW IN NIGERIA

Partners

National
Federal Epid. NHMIS
NPHCDA

(Coordinate surveillance activities, investigate, analyze, and respond)

Reference Laboratory

(Carry out advance analysis & share results)

State (State epidemiologist)

(Investigate, analyze, and respond)

Laboratory

(Determine sample condition, process sample, share results)

LGA
DSNO

(Assign ID Number, collect specimens, investigate, analyze and respond

Health Facility

(Detect and manage cases, collect specimens)

Feedback

Community

Reporting

An ill person either referred or not, presents with a medical condition that requires attention. Information about the patient is recorded in a register. The register is updated daily to include information for both inpatients and outpatients. At a minimum, the following data is collected: the patient's ID number, date of onset of illness, date of presentation at the facility, date of discharge (inpatient only), village (location), age, sex, diagnosis, treatment, and outcome.

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

Periodically, once weekly, monthly, quarterly or annually, the health facility summarizes the number of cases and deaths for each routinely reported priority diseases and conditions and report the totals to the LGA. The health facility performs some analysis of the data such as keeping trend lines for selected priority diseases or conditions and observing whether certain thresholds are passed to alert staff to take action. One action that is taken if an outbreak is suspected is to obtain laboratory confirmation. Laboratory specimens are obtained and the following data is documented: type of specimen, date obtained, date sent to the lab, condition of specimen when received in the lab (good or poor), adequacy of specimen (adequate or not adequate) and lab results.

At the LGA level, data is compiled monthly for each of the priority diseases and conditions. The LGA prepares analyses of time, place and characteristics of the patients such as age and sex for both outpatients and inpatients. These results are sent to either the state level or the FMOH (EPID/HER division).

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

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

Feedback on surveillance performance indicators, laboratory results and basic data analysis should be given to the lower levels.

HOW DOES INFORMATION FLOW IN AN INTEGRATED DISEASE SURVEILLANCE SYSTEM?

Note:
1. Every State shall establish a functional State public health laboratory. Where this is not immediately possible, shall identify and designate a State public laboratory from an established clinical laboratory within the State.
2. Every LGA shall identify a PHC in each ward to collate and submit ALL surveillance data from ALL health facilities within their respective wards to the LGAs

IHR (2005) is not a separate surveillance system but requires a "sensitive and flexible surveillance system that meets international standards. IHR (2005) affects cross-border collaboration for particular key events and can easily be achieved when IDSR works. IHR (2005) has introduced the notion of "event-based" surveillance to IDSR in order to address rumors of "unexplained illness or clusters" as an event category for reporting from lower levels to national level. IDSR and IHR share common functions as described in the diagrams below (detection, reporting, confirmation and verification, notification and reporting and timely response).

Implementing IHR through IDSR

The IHR have practical implications for IDSR. In the IHR (2005), all public health conditions and events of international concern (PHEIC) should be detected, assessed and responded to timely, using an adapted response rather than preset measures. The IHR (2005) include the control of borders (ports, ground crossing Points of Entry) and containment at source of public health events. Because of the major role it plays for timely detection and verification of suspected public health emergencies, event-based surveillance is now part of IDSR and the IHR.

Note: The process of notifying WHO of events under the IHR calls upon the use of the "Decision instrument" that involves the implementation of core IDSR functions: case definition, laboratory confirmation, data analysis, interpretation of the findings and reporting (please see Annex 2C in Section 2). A summary of the events required by the IHR for reporting is included in the following box:

The three main categories of events that require to be notified under the IHR are:

- F**our conditions** that <u>must be notified</u> to WHO: smallpox, poliomyelitis due to wild-type poliovirus, human influenza caused by a new subtype, and SARS (see next paragraph and algorithm in Annex in Section 2). This notification will normally be conducted at district level or above, as decided by national authorities. The four diseases are fully covered in these Technical Guidelines.

- Other diseases and events <u>may require notification</u> if they are considered to be events of potential international public health concern. This assessment will normally be conducted at district level or above as decided by national authorities (by using the IHR decision instrument in Annex of Section 2). The diseases referred to in this category by the IHR include the following: cholera, plague, yellow fever, VHF, other diseases that are of special national or regional concern e.g. dengue fever. These conditions are fully dealt with in these Technical Guidelines.

- "Any event of potential international public health concern including those of unknown cause or source, and those involving other events or diseases" than those listed in the above two bullet points (by using the IHR decision instrument in Annex of Section 2). A list of such events is provided in Section 2. These events are NOT specifically dealt with in these Technical Guidelines and more details can be obtained in environmental control literature[2].

The development of event based surveillance calls upon community participation and the use of information technology products (e.g; Promed, GIPHIN, IRIN, and WHO-EMS software). The relevant IDSR data collection forms designed for use at all levels is now customized to capture PHEIC (including diseases). IDSR calls for a surveillance coordination body at all levels of the health system. The national IHR focal point goes beyond the health sector, by including all hazards of concern in the national coordination body. Please refer to Annex B for detailed information about IHR (2005).

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[2] *A guide for assessment teams. International Health Regulations (2005): Protocol for assessing national surveillance and response capacities for the International Health Regulations (IHR) in accordance with Annex 1A of the regulations. February 2009.*

How can IDSR contribute to epidemic preparedness?

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

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

Because epidemiologic surveillance collects data for describing and analyzing health events, it provides skills and information for early detection of outbreaks leading to enhanced preparedness for emergency situations. For example, a LGA's Epidemic Management Committee (EMC) can define relevant roles in outbreak response in advance. Limited resources are maximized by combining resources for training, demonstrations and setting aside adequate supplies of equipment, vaccines, drugs and supplies.

How are surveillance functions described in these guidelines?

These guidelines assume that all levels of the health system are involved in conducting surveillance activities for detecting and responding to priority diseases and conditions (even though the different levels do not perform identical functions). These activities include the following core functions:

Step 1 - Identify cases and events. Use standard case definitions, identifying priority diseases, conditions and events.

Step 2 - Report suspected cases or conditions or events to the next level. If this is an epidemic prone disease or a potential Public Health Emergency of International Concern (PHEIC), or a disease targeted for elimination or eradication, respond immediately by investigating the case or event and submit a detailed report. For events to be notified under IHR, use the decision instrument (Annex 2 of IHR) to identify any potential PHEIC.

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

Step 4 - Investigate and confirm suspected cases, outbreaks or events. Take action to ensure that the case, outbreak or event is confirmed including laboratory confirmation wherever it is feasible.

Gather evidence about what may have caused the outbreak or event and use it to select appropriate control and prevention strategies.

Step 5 – Prepare Take steps in advance of outbreaks or public health events so that teams may respond quickly and essential supplies and equipment are available for immediate action. It is also premised on the availability of surveillance data.

Step 6 - Respond Coordinate and mobilize resources and personnel to implement the appropriate public health response.

Step 7 – Communicate/Provide feedback. Encourage future cooperation by communicating with levels that provided data, reported outbreaks, cases and events about the investigation outcome and success of response efforts.

Step 8 - Evaluate and improve the system. Assess the effectiveness of the surveillance and response systems, in terms of timeliness, quality of information, preparedness, thresholds, case management and overall performance. Take action to correct problems and make improvements.

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

Community:	Represented by basic village-level services such as trained birth attendants, community or village health agents, or similar care providers, village leaders (religious, traditional or political) or school teachers, veterinarians and/or health extension workers, pharmacists, traditional healers.
Health facility:	Defined by each country. For surveillance purposes, all institutions (public, private, NGOs or other governmental) with out-patient and/or in-patient facilities are defined as a "health facility."
LGA:	The LGA is the lowest administrative unit and is the level responsible for primary health care implementation.
State:	The intermediate level of government is responsible for supervision and provision of technical support to the LGA.

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

National level: This is the Federal level where policies are set with coordination of technical support to States and LGAs.

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

How can LGAs strengthen surveillance and response?

Nigeria has completed assessment of the national surveillance system using an assessment tool developed by WHO/AFRO. The assessment has been used to prepare a five-year National Surveillance plan and also used by States as a guide in preparing annual surveillance plan. LGA may update its profile to decide which priority activities can take place to improve surveillance and response capacity. There is a checklist in Annex 1 at the end of this introduction that outlines what needs to be in place in order to conduct IDSR.

LGAs can also use a matrix (table) of surveillance functions and skills to describe respective roles in the surveillance system. On pages 15 – 16 ,there is a matrix that describes a complete system in which all the skills and activities are in place. Each level supports activities at other levels and reinforces the opportunity for successful decision-making at corresponding levels and functions. In a developing system, the matrix provides a systematic framework for improving and strengthening the system.

Practical uses of the matrix include:

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

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

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

The matrix on pages 15 - 16 defines the surveillance functions and how they are achieved at each level of the health system.

Core capacity requirements for surveillance and response under IHR

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

Annex 2 of the regulations defines the core capacity requirements for surveillance and response. The regulations recognise the following three levels of the health care system.

- Local Government public health response level
- State public health response level
- National public health response level

Local Government public health response level

At the local government public health response level, the capacities are:

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

(b)   To report all available essential information immediately to the appropriate level of healthcare response. At the community level, reporting shall be to local community health-care institutions or the appropriate health personnel. At the LGA public health response level, reporting shall be to the State or national response level, depending on organizational structures.

For the purposes of these guidelines, essential information include:
- clinical descriptions
- laboratory results
- sources and type of risk
- numbers of human cases and deaths
- conditions affecting the spread of the disease and the health measures employed

(c)   To implement preliminary control measures immediately.

State public health response level

The core capacity requirements at State level are:

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

(b)   To assess reported events immediately and if found urgent, to report all essential information to the national level. For the purpose of this (Annex 1C), the criteria for urgent events include serious public health impact and/or unusual or unexpected nature with high potential for spread.

National Level: Assessment and Notification

The capacity requirements at National level are:
(a)   To assess all reports of urgent events within 48 hours; and
(b)   To notify WHO immediately through the National IHR Focal Point when the assessment indicates the event is notifiable pursuant to Article 6,7 and 9 (Annex 2 and 3).

National Level Public health response

The capacities are:
- To determine rapidly the control measures required to prevent domestic and international spread
- To provide support through specialized staff, laboratory analysis of samples (domestically or through collaborating centres) and logistic assistance (e.g. equipment, supplies and transport)
- To provide on-site assistance as required to supplement local investigations
- To provide a direct operational link with senior health and other officials to approve rapidly and implement containment and control measures
- To provide direct liaison with other relevant government ministries
- To provide by the most efficient means of communication available, links amongst stakeholders (hospitals, clinics, airports, sea ports, ground crossings, laboratories and other key operational areas) for the dissemination of information and recommendations received from WHO regarding events in the Country and other Countries
- To establish, operate and maintain a national public health emergency response plan, including the creation of multidisciplinary/multi-sectoral teams to respond to events that may constitute a PHEIC; and
- To provide the foregoing on a 24-hour basis.

IDSR CORE FUNCTIONS & ACTIVITIES BY HEALTH SYSTEM LEVEL

	Identify *Note: Laboratory steps apply to each level with access to laboratory services*	2.0 Report	3.0 Analyse and Interpret	4.0 Investigate *Note: These steps assume appropriate laboratory capacity*	5.0 & 6.0. Prepare and Respond	7.0 Communicate & Provide Feedback	8.0 Evaluate and Improve the System
Community	1. Use simple case definitions to identify priority diseases or conditions in the community	2. Know which health events to report to the health facility and when to report them	3. Involve local leaders in observing and interpreting disease patterns and trends in the community	• Support case investigation activities such as informing the community of the problem, case finding, collecting of specimens and other activities	• Participate in selecting response activities • Participate in response activities • Mobilise community resources appropriate for response activities	Give feedback to community members about reported cases and prevention activities	• Determine if action took place as planned • Participate in evaluating the community response to the public health action
Health Facility	1. Use standard case definitions to identify and record priority diseases or conditions that present in: - inpatient and outpatient services - community reports - private sector reports 2. Use standard protocols to process laboratory specimens 3. Collect and transport clinical specimens for laboratory investigation	4. Report case-based information for immediately notifiable diseases 5. Report data gathered from inpatient and outpatient services 6. Report summary data to LGA 7. Report laboratory results from target sites for selected diseases	8. Prepare and periodically update graphs, tables and charts to describe time, person and place for reported diseases and condition 9. Identify and report immediately any disease or condition that: - *exceeds an alert/epidemic threshold or* - *occurs in locations where it was previously absent or* - *occurs more often in a population group than previously or* - *presents unusual trends or patterns* *1. Interpret results. Discuss possible public health action with LGA team* *2.* Observe changes in trends during routine analysis of laboratory results	• Take part in investigation of reported outbreaks • Collect, package, store, and transport specimens for laboratory testing • Use investigation and laboratory results to confirm the outbreak • Process and record laboratory results • Provide the results to clinical staff and patients	• Treat cases and contacts according to standard case management guidelines • Use appropriate infection control measures • Carry out public health response with the LGA level • Mobilise community involvement in the response • Advocate for resources	Give feedback to community members about outcome of reported cases and prevention activities	• Monitor timeliness and completeness of reporting routine and case based information to the LGA level • Evaluate preparedness and timeliness of response activities • Evaluate appropriateness and effectiveness of case management • Take action to improve reporting practices • Take action to improve readiness for timely response to outbreak • Maintain contact with community for improved preparedness and prevention activities • Monitor the interval between receipt of specimens in the lab and reporting of results • Monitor quality of laboratory results
LGA	1) Maintain activities for collecting routine surveillance data in a timely way 2) Review records of suspected outbreaks 3) Distribute specimen collection kits for special surveillance activities	10. Support health facilities in knowledge and use of standard case definitions for reporting priority diseases and conditions 11. Make sure health facility staff know when and how to report priority diseases and conditions *12.* Promptly report immediately-notifiable diseases to the State level *13. Report laboratory results of priority diseases to the State level*	14. Define and obtain data for ensuring accurate denominators 15. Aggregate data from health facility reports 16. Analyse case-based data by person, place and time 17. Calculate rates and thresholds 18. Compare current data with previous periods 19. Prepare and periodically (weekly for some diseases)	• Arrange and lead investigation of reported cases or outbreaks • Assist health facility in safe collection, packaging, storage and transport of laboratory specimen for confirmatory testing • Receive and interpret laboratory results • Determine if the reported outbreak is confirmed • Report the confirmed outbreak to the State level	• Convene epidemic management committee and plan response • Conduct training for epidemic management activities • Plan timely community information and education activities • Alert nearby areas and LGAs about the confirmed outbreak • Select and implement appropriate outbreak and other public health response • Provide logistic support to health facility level	• Alert nearby areas and LGA about outbreaks • Give health facilities regular and periodic feedback about routine control and prevention activities	• Monitor and evaluate program targets and indicator for measuring quality of the surveillance system • Monitor and evaluate timeliness and completeness of reporting from health facilities in the LGA • Monitor and evaluate timeliness of response to outbreak • Monitor routine prevention activities and modify them as

Level	Collection	Reporting	Analysis	Confirmation/Investigation	Response	Feedback	Monitoring & Evaluation
			update graphs, tables and charts to describe time, Person and place for reported diseases and conditions 20. Make conclusions about trends, thresholds and analysed results 21. Describe risk factors for priority disease or conditions 22. Each laboratory should analyse its own data		• Mobilise community for response		needed.
State	1. .Maintain activities for collecting routine surveillance data in a timely way 2. Support/conduct special survey to obtain information about reported outbreaks 3. Distribute specimen collection kits for special surveillance activities 4. Advocate and allocate resources for identification of priority diseases 5. Support LGA in knowledge and use of standard case definitions	6. Support reporting priority diseases and conditions 7. 7.Make sure LGA and health facility staff know when and how to report priority diseases and conditions 8. 8.Promptly report immediately-notifiable diseases to the national level 9. *9.Report laboratory results of priority diseases to the LGAs and national level*	10.Define and obtain data for ensuring accurate denominators 11. Aggregate data from LGA reports 12. Analyse case-based data by person, place and time 13. Calculate rates and thresholds 14. Compare current data with previous periods 15. Prepare and periodically (weekly for some diseases) update graphs, tables and charts to describe time, person and place for reported diseases and conditions 16. Make conclusions about trends, thresholds and analysed results 17. Describe risk factors for priority disease or conditions 18. Each laboratory should analyse its own data	• Arrange and lead investigation of reported cases or outbreaks • Assist LGA and health facility in safe collection, packaging, storage and transport of laboratory specimen • Receive and interpret laboratory results • Determine if the reported outbreak is confirmed • Report the confirmed outbreak to the National level	• Hold epidemic management committee meeting and plan response • Conduct training for epidemic management activities • Alert nearby and States about the confirmed outbreak • Select and implement appropriate outbreak and public health response • Provide logistic support to health facility level • Support LGAs to mobilise community for response	• Alert nearby LGAs and states about outbreaks • Give LGAs regular and periodic feedback about routine control and prevention activities	• Monitor and evaluate program targets and indicator for measuring quality of surveillance system • Monitor and evaluate timeliness and completeness of reporting from and LGAs in the state • Monitor and evaluate timeliness of response to outbreak • Monitor routine prevention activities and modify them as needed.
National	1. Establish steps for surveillance 2. Conduct special survey to gather information about reported cases, outbreaks or unusual events 3. Define and update surveillance needs and implement training for and other support to each level	7. Set policies and procedures for reporting priority diseases and conditions. 8. Include private sector laboratories in the reporting network 9. Support reporting activities throughout the system 10. Receive report of priority diseases	12. Set policies and procedures for analysing and interpreting data 13. Aggregate data received from State reports 14. Make sure each level uses appropriate denominators for analysis	• Alert laboratory and support its confirmation activities: transport media, transport of specimens • Support activities for investigating reported outbreaks: supplies, logistics, budget • Collaborate with international authorities as needed during outbreak investigations	• Set policies and procedures for responding to cases and outbreaks of priority diseases and conditions • Support epidemic preparedness and response activities • Report and disseminate results of outbreak response in bulletins, media, press releases and briefings	• Give feedback about response activities to each level • Give State regular, periodic feedback about routine control and prevention activities • Develop and periodically distribute national newsletters/	• Establish and disseminate policies and procedures for monitoring surveillance & outbreak response activities • Establish policies and practices for supervising surveillance and

	4. Advocate for adequate resources to support the identification and reporting of cases *5. Set policies and procedures with Central Public Health Laboratory (create co-ordination mechanism)* *6. Use national reference laboratories for maintaining quality control and standards*	and conditions 11. Report surveillance data on priority diseases to WHO and other partners	15. Interpret trends from national perspective 16. Adapt or define alert/epidemic thresholds 17. Provide training resources for analysing and interpreting data 18. Analyse data by time, person and place 19. Analyse map and stratify data by State and LGA and other factors 20. Make conclusions based on analysis results 21. Define public health analysis skills appropriate to each level of personnel in the system	• Notify WHO/partners about confirmed outbreak • Process specimens for investigation and send timely results as required to each level • Request additional specimen as needed • Take part in epidemic response team		bulletin for epidemiology and public health to all stakeholders	outbreak response activities • Evaluate surveillance and response activities and implement as appropriate: - Monitor and evaluate program targets and indicators for measuring quality of surveillance system - Monitor and evaluate timeliness and completeness of reporting from States - Monitor and evaluate timeliness of national support for outbreak response - Monitor and evaluate effectiveness of State and LGA outbreak response activities • Monitor routine prevention activities and modify as appropriate • Monitor laboratory quality assurance and control at all levels
WHO Country Representative and WHO Regional Office	Support policy setting at national and regional level for detecting priority diseases Mobilise resources for training, logistics and supervision Develop and distribute standard guidelines for surveillance "best practices Inform countries about problems that may cross borders or have impact on regional areas	22. Receive reports of outbreaks and international notifiable diseases	23. Establish and disseminate standard guidelines for analysis of data for each priority disease	• Communicate recommendations for case investigation and laboratory confirmation • Mobilize resources for improving laboratory capacity and skill • Mobilize resources for investigation and confirmation as required based on national level need and request • Provide laboratory training and equipment • Establish guidelines for preparedness and outbreak investigation • Participate in investigations as requested	• Support response activities (technical experts, guidelines) • Report to and inform international authorities about outbreak response • Calculate response indicators and report status to next level • Assist national level with epidemiological response and development of public health action	• Provide feedback for collaboration with national and regional levels • Inform Countries about problems that may cross borders or have impact on regional levels • Report analysis results in regional and international bulletins for disease trends and patterns • Develop and distribute regional bulletin for epidemiology and public health	• Use reports from countries to measure their systems and advocate for improvements

What is contained in the guidelines?

The guidelines aim at providing basic general guidance on surveillance and response. These guidelines contain practical recommendations for carrying out surveillance and response activities at all levels. The guidelines are intended for use as:

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

Who are the guidelines for?

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

- Surveillance officers at other levels
- National and State epidemiology unit staff
- IHR National Focal Points
- National communicable disease program managers
- LGA health management teams
- Medical and nursing officers.
- Environmental Health Officers
- Heads of Health facilities
- Medical officers of health and PHC co-ordinators
- Health educators
- Community Health Officer and Community Health extension workers
- Laboratory personnel
- Medical records officers/Statisticians
- Medical and Health training Institutions
- Veterinary and wildlife health officers
- Logistician
- Community leaders
- Other health partners including NGOs

What are the priority diseases for IDSR?

The Federal Ministry of Health selected fortyone (41) communicable and non-communicable diseases and conditions for integrated disease surveillance and response. These diseases were selected on the basis of one or more of the following:

- Top causes of high morbidity and mortality in the country (for example, malaria, pneumonia, diarrhoeal diseases, tuberculosis, and HIV/AIDS, SARI);
- Have epidemic potential (for example, CSM, measles, VHF and cholera);
- Surveillance required internationally (for example, plague, yellow fever cholera ,SARS, human influenza caused by a new subtype);
- Have available effective control and prevention interventions for addressing the public health problem they pose (for example, Onchocerciasis, Schistosomiasis, Human African Trypanosomiasis);
- Can easily be identified using simple case definitions; (for example Dracunculiasis/ Guinea Worm)
- Have intervention programmes supported by WHO for prevention and control, eradication or elimination of the diseases (for example, Guinea worm, Poliomyelitis, Leprosy)

Table 1: Priority diseases, conditions and events for Integrated Disease Surveillance and Response - 2010		
Epidemic prone diseases	**Diseases targeted for eradication or elimination**	**Other major diseases, events or conditions of public health importance**
1. Cholera 2. Measles 3. Meningococcal meningitis 4. Viral haemorrhagic fever (Lassa Fever, Dengue) 5. Yellow fever	1. Buruli ulcer 2. Dracunculiasi (Guinea Worm) 3. Leprosy 4. Lymphatic filariasis 5. Neonatal tetanus 6. Noma 7. Onchocerciasis 8. Poliomyelitis[1] 9. [1]Disease specified by IHR (2005) for immediate notification	1.Acute viral hepatitis 2. Diabetes mellitus 3. Diarrhoea with dehydration less than 5 years of age 4. HIV/AIDS (new cases) 5. Hypertension 6. Injuries (Road traffic Accidents) 7. Malaria 8. Malnutrition in children under 5 years of age 9. Maternal deaths 10. Mental Neurological & Substance Abuse (MNS) disorders(Epilepsy, Schizorpherinia, depression etc) 11. Human Rabies 12. Severe pneumonia in less than 5 years of age 13. STIs 14. Sickle Cell Disorder 15. Trachoma 16. Human African Trypanosomiasis 17. Tuberculosis 18. Schistosomiasis 19. SARI 20. Diarrhoea with blood 21. Whooping cough (Pertusis) 22. Diphtheria 23. Snake bites 24. Soil Transmitted Helminths 25. Adverse Events Following Immunization (AEFI)* 26. Asthma 27. Typhoid Fever *All serious AEFIs shall be reported immediately
	Diseases or events of international concern	
	1.Human influenza due to a new subtype[1] 2. SARS[1] 3. Smallpox[1] 4. Any public health event of international or national concern (infectious, zoonotic, food borne, chemical, radio nuclear, or due to unknown condition- Anthrax, Plague) [1]Disease specified by IHR (2005) for immediate notification	

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

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

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

Annexes to Introduction

ANNEX A   Tool to conduct assessment of surveillance and response at the LGA level

ANNEX B   Potential events of international health concern requiring reporting to WHO under the International Health Regulations (2005).

ANNEX C   Required surveillance and response core capacities as described in the IHR (2005)

ANNEX A
TOOL TO CONDUCT ASSESSMENT OF SURVEILLANCE AND RESPONSE AT THE LGA LEVEL

Nigeria has assessed its national surveillance, epidemic preparedness and response systems and identified where improvements are needed. This assessment used a tool developed by WHO/AFRO. It provided results that were used to prepare the National five-year IDSR plan.

Integrated Disease Surveillance and Response is not proposing a new system, but a strategy that provides guidance on how surveillance and response activities can be improved. LGAs, which want to update their health profiles, can use the checklist such as the one below to help identify and select priority activities to improve their surveillance and response capacity.

Case and event identification:

1. ___Determine availability and knowledge of standard case definitions for reporting suspected priority diseases and conditions including events of public health concern_____
2. Define the sources of information about health events in the LGA, including points of contact the community have with health services. For example, list the following sources on a list of LGA reporting sites such as the list in Annex 6 of this section:
   - Health facilities and hospitals
   - Community health workers
   - Traditional birth attendants
   - Rural community leaders who have knowledge of health events in the community (for example, the village elders, traditional healers, school teachers, leaders of faith-based communities, etc.)
   - Public health officers
   - Private sector practitioners
   - Public safety officers from rescue, police or fire departments
   - Animal health and veterinary structures and services
   - Industry, food safety and environmental health laboratories
   - Mass media, web sites and health news search applications
   - Others (please describe)_____

3. __ Identify surveillance focal points for each source of information. Identify and specify the opportunities for community involvement in surveillance of health events.

Reporting

4.   Specify the priority events, diseases and conditions for surveillance within the LGA and those directed by national policy. List diseases that are:
a.   Epidemic-prone
b.   Diseases targeted for eradication and elimination
c.   Other diseases of public health importance including non-communicable diseases

5.   For each priority event, disease or condition, review the minimum data element that health facilities and other sources should report. State when it should be reported, to whom and how. State the information that should be reported from in-patient sources and outpatient sources. For example, a minimum requirement would be to report all cases and deaths for the selected diseases and conditions
   a.   State the diseases or conditions that require immediate reporting and communicate the list to health facilities in the LGA.
   b.   Define the means for reporting data to the LGA (by phone, by form, by voice). If there is electronic reporting, do all facilities have access to computers and modems?
   c.   Define how often the required data should be reported.

6.   Define the data management tools available in the LGA and how they should be used in an integrated system
   a.   Case-based surveillance reporting forms
   b.   Lab-specimen-based surveillance reporting forms
   c.   Line lists for use in outbreaks
   d.   Tables for recording summary totals
         i.   Routine weekly reporting forms
         ii.   Routine monthly reporting forms
         iii. Routine quarterly reporting forms
         iv.   Graphs for time analysis of data
         v.   Maps for place analysis of data
         vi.   Charts for person analysis of data

7.   Periodically update the availability of relevant supplies at each reporting site for conducting surveillance. (Note: If a reporting site has the capacity for electronic reporting, there should be an electronic format that is compatible with the methods

used at the LGA, region and national levels. (If electronic reporting is <u>not</u> available, ensure that the focal points who are required to manage data have a reliable supply of data collection forms, paper, coloured pencils, graph paper, and log books).

Data analysis

8. Define the data management requirement for each reporting site. For example, develop and disseminate the procedures including deadlines so that reporting sites know they must report each reporting period (e.g., month).
   a. Tally, compile and report summary totals
   b. Check data quality and eventually clean them
   c. Analyze data: produce weekly/monthly/Quarterly/Annual summaries in tables, graphs or maps
   d. Provide some interpretation to the next higher level.
   e. Submit data to the next level (SMS, e-mail, fax/case-based forms, and line-list).
   f. File and secure back-up copies of the data
   g. Provide feedback to the community and to all relevant Reporting Sites

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

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

Investigation and confirmation of suspected cases, outbreaks or events:

11. Describe the laboratory referral network for confirming priority diseases and conditions in the LGA. For example, list the following:
    a. Public, private or NGO LGA facilities with reliable laboratory services for confirming priority diseases.

b. Prevention, control or special surveillance activities in the LGA with laboratory access (for example, any HIV sentinel surveillance sites in the LGA).

Preparation for response and Response to outbreaks and other public health events

12. Update the policies of the LGA rapid epidemic response team so that assessing preparedness is a routine agenda item of the team. Specify and disseminate schedules for:
    a. Meeting to routinely assess preparedness for response and discuss current problems or activities
    b. Outbreak response meetings

13. For each priority event, disease or condition selected, state the available public response activity.

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

Communication and Feedback

15. Define methods for informing and supporting health workers in the implementation of integrated disease surveillance. For example:
    a. List the current opportunities for training health workers in surveillance, response or data management in the LGA.
    b. Coordinate training opportunities between disease programs that take advantage of overlapping skills between programs such as supervision, report writing, budgeting, data analysis, and using data to set priorities.
    c. Define the training needs for each category of health workers for either initial training in surveillance and response skills or refresher training in how to integrate surveillance activities.

16. Describe how communication about surveillance and response takes place between the LGA and the surveillance focal points. Include methods such as monthly meetings, newsletters, telephone calls and so on. Update the description periodically.

17. Review and update feedback procedures and methods between the LGA, health facilities and community as well as between the LGA and higher levels. Specify the feedback methods and update as necessary:

a. Bulletins summarizing data reported by health facilities to the LGA
b. Periodic meetings to discuss public health problems and recent activities
c. Supervisory visits

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

Evaluation and improvement of the surveillance system

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

20. State three or more objectives you would like to achieve for improving surveillance in your LGA over the next year.

ANNEX B: Events of potential international health concern requiring reporting to WHO under the International Health Regulations 2005

Surveillance on specific risks

The control or containment of known risks to public health is one of the most powerful ways to improve international public health security. The threat posed by known risks constitutes the vast majority of events with a potential to cause public health emergencies which fall within the scope of the International Health Regulations (2005). There are already existing control programmes which address infectious diseases as well as food and environmental safety and contribute significantly to WHO global alert and response system.

The environmental hazards include but are not limited to:
- Chemical
- Food
- Ionizing radiation
- Non-ionizing radiation

Technical information on these risks can be obtained from various sources.

Areas of interest for the purpose of **capacity building** of integrated surveillance should include partnerships to address the following:

1. Environmental health emergencies like:
   - Natural events
   - Technological Incidents
   - Complex emergencies
   - Deliberate events
2. Chemical risks in food:
   - Acute and Chronic dietary exposure (environmental or intentional pollution)
3. Zoonoses:
   - Emerging zoonoses
   - Neglected zoonoses

Topics for surveillance on specific risks

1. Infectious disease hazards

Known, new and unknown infectious disease threats.

2. Zoonotic events

The emergence and re-emergence of zoonoses and their potentially disastrous effect on human health has made zoonoses a priority issue for veterinarian services.

3. Food safety events

Food and waterborne diarrhoeal diseases are leading causes of illness and death in less developed countries, killing approximately 1.8 million people annually, most of whom are children. The identification of the source of an outbreak and its containment are critical to the IHR.

4. Chemical events

The detection and control of chemical, toxic and environmentally-induced events are critical for the implementation of the IHR.

5. Radiological and nuclear events

A radio-nuclear emergency at a nuclear facility may be caused by accidental spills or the result of a deliberate act. It may also be detected as the result of clinical examination, when patients with radiation injuries are admitted to health care facility, while the source of exposure may not yet be confirmed.

Source: *A guide for assessment teams. International Health Regulations (2005): Protocol for assessing national surveillance and response capacities for the International Health Regulations (IHR) in accordance with Annex 1A of the regulations. February 2009.*

ANNEX C: INTERNATIONAL HEALTH REGULATIONS (IHR)

A. CORE CAPACITY REQUIREMENTS FOR SURVEILLANCE AND RESPONSE

1. States Parties shall utilize existing national structures and resources to meet their core capacity requirements under these Regulations, including:

   a) their surveillance, reporting, notification, verification, response and collaboration activities; and
   b) their activities at designated airports, seaports and ground crossings.

2. Each State Party shall assess, within two years following the entry into force of these Regulations for that State Party, the ability of existing national structures and resources to meet the minimum requirements described in this Annex. As a result of such assessment, States Parties shall develop and implement plans of action to ensure that these core capacities are present and functioning throughout their territories as set out in paragraph 1 of Article 5 and paragraph 1 of Article 13.

3. States Parties and WHO shall support assessments, planning and implementation processes under this Annex.

4. At the local community level and/or primary public health response level

The capacities:
   a) to detect events involving disease or death above expected levels for the particular time and place in all areas within the territory of the State Party; and
   b) to report all available essential information immediately to the appropriate level of healthcare response. At the community level, reporting shall be to local community health-care institutions or the appropriate health personnel. At the primary public health response level, reporting shall be to the intermediate or national response level, depending on organizational structures. For the purposes of this Annex, essential information includes the following: clinical descriptions, laboratory results, sources and type of risk, numbers of human cases and deaths, conditions affecting the spread of the disease and the health measures employed; and
   c) to implement preliminary control measures immediately.

5. At the intermediate (State) public health response levels

The capacities:

   a) to confirm the status of reported events and to support or implement additional control measures; and
   b) to assess reported events immediately and if found urgent, to report all essential information to the national level. For the purpose of this Annex, the criteria for urgent events include serious public health impact and/or unusual or unexpected nature with high potential for spread.

6. At the national level

Assessment and notification: The capacities:

   a) to assess all reports of urgent events within 48 hours; and
   b) to notify WHO immediately through the National IHR Focal Point when the assessment indicates the event is notifiable pursuant to paragraph 1 of Article 6 and Annex 2 and to inform WHO as required pursuant to Article 7 and paragraph 2 of Article 9.

Public health response: The capacities:

   a) to determine rapidly the control measures required to prevent domestic and international spread;
   b) to provide support through specialized staff, laboratory analysis of samples (domestically or through collaborating centres) and logistical assistance (e.g. equipment, supplies and transport);
   c) to provide on-site assistance as required to supplement local investigations;
   d) to provide a direct operational link with senior health and other officials to approve rapidly and implement containment and control measures;
   e) to provide direct liaison with other relevant government ministries;
   f) to provide, by the most efficient means of communication available, links with hospitals, clinics, airports, seaports, ground crossings, laboratories and other key operational areas for the dissemination of information and recommendations received from WHO regarding events in the State Party's own territory and in the territories of other States Parties;
   g) to establish, operate and maintain a national public health emergency response plan, including the creation of multidisciplinary/multisectoral teams to respond to events that may constitute a public health emergency of international concern; and
   h) to provide the foregoing on a 24-hour basis.

B. CORE CAPACITY REQUIREMENTS FOR DESIGNATED AIRPORTS, SEAPORTS AND GROUND CROSSINGS

1. At all times

The capacities:

a) to provide access to (i) an appropriate medical service including diagnostic facilities located so as to allow the prompt assessment and care of ill travellers, and (ii) adequate staff, equipment and premises;

b) to provide access to equipment and personnel for the transport of ill travellers to an appropriate medical facility;

c) to provide trained personnel for the inspection of conveyances;

d) to ensure a safe environment for travellers using point of entry facilities, including potable water supplies, eating establishments, flight catering facilities, public washrooms, appropriate solid and liquid waste disposal services and other potential risk areas, by conducting inspection programmes, as appropriate; and

e) to provide as far as practicable a programme and trained personnel for the control of vectors and reservoirs in and near points of entry.

2. For responding to events that may constitute a public health emergency of international concern

The capacities:

a) to provide appropriate public health emergency response by establishing and maintaining a public health emergency contingency plan, including the nomination of a coordinator and contact points for relevant point of entry, public health and other agencies and services;

b) to provide assessment of and care for affected travellers or animals by establishing arrangements with local medical and veterinary facilities for their isolation, treatment and other support services that may be required;

c) to provide appropriate space, separate from other travellers, to interview suspect or affected persons;

d) to provide for the assessment and, if required, quarantine of suspect travellers, preferably in facilities away from the point of entry;

e) to apply recommended measures to disinsect, derat, disinfect, decontaminate or otherwise treat baggage, cargo, containers, conveyances, goods or postal parcels including, when appropriate, at locations specially designated and equipped for this purpose;

f) to apply entry or exit controls for arriving and departing travellers; and

g) to provide access to specially designated equipment, and to trained personnel with appropriate personal protection, for the transfer of travellers who may carry infection or contamination.

Section 1: Identify cases of priority diseases, conditions and events

This section describes how to:

- Use standard case definitions for reporting suspected priority diseases and conditions including events of public health importance
- Update LGA procedures for surveillance and response
- Update description and listing of catchment areas, including distribution of data collection forms, reporting tools and guidelines
- Use the laboratory network and procedures to improve capacity for surveillance and response, including the ability to confirm suspected outbreaks

1.0 *Identify cases of priority diseases, conditions and events*

Health staff conduct surveillance activities at all levels of the health system so they can detect public health problems of concern to their community. Surveillance priorities may be communicable and non-communicable diseases, conditions or events that include national or local priorities such as acute outbreaks, maternal deaths or events associated with human health. An essential function of a public health surveillance system is to be vigilant in its capacity to detect not only known public health threats with established case definitions and formal reporting channels but also events or hazards that are not specifically included in the formal reporting system. These may be events such as clusters of disease patterns or rumours of unexplained deaths.

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

- A patient falls ill and seeks treatment from a health facility.

- A member of the community reports a single suspected case, a cluster of deaths or unusual event(s) to the health facility. For example, a pharmacy reports a sharp increase in the number of purchases of a particular medication or treatment. The school reports an increased number of absences due to similar signs and symptoms such as Influenza-Like Illness (ILI).

- During active searches to find additional cases for a particular disease, the surveillance officer or the health officer conducting the search identifies cases of other priority diseases that have not been reported. For example, during a review of the clinic register for cases of Acute Flaccid Paralysis (AFP), the officer also look for suspected cases of other vaccine-preventable diseases or diseases with epidemic potential, such as Measles, Neonatal tetanus, Meningitis, Cholera or non - communicable diseases such as high blood pressure and Diabetes mellitus

- Radio, television or newspapers report or unexplained health events in the area or increase in the number of people getting sick from a known epidemic prone disease such as Meningitis or Diarrhoeal diseases.

- An individual health facility reports a cluster of deaths or an unusual increase in the number of cases which may not cross the health facility's epidemic threshold. When the cases are added together and analyzed at the LGA level with reports from other health facilities, an outbreak could be detected. For

example, if an individual health facility reports that there has been an adult with bloody diarrhoea who dies, the problem appears to be only one in that catchment area. If several health facilities report similar event, a LGA problem is detected and action can be taken.

- Vital events records show an increase in neonatal deaths.

1.1   Use standard case definitions

A standard surveillance 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 at a time or place with the number occurring in another time or place.

The case definition also specifies those diseases and conditions that must be reported for surveillance purposes. The standard case definition will permit the surveillance system to obtain an improved detection of all cases of a disease or condition in a given population and exclude detection of other similar conditions.

Using the same case definition throughout a national system allows the public health surveillance system to track priority diseases or conditions and use thresholds or signals for public health action. When health facilities and LGAs use different case definitions, tracking the trend of a disease, condition or event is difficult. Urgent action such as investigating the cause of the change in the trend is not possible. Health workers who analyze the data using one definition will not know if the trends from another catchment area are due to similar or different causes.

Using standard case definitions is also important in implementing the International Heath Regulations (2005). Even at LGA level, health staff should be aware of case definitions of diseases or events that may afflict not only the local community but also have the potential for spread across geographic boundaries.

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

1.1.1 Distribute standard case definitions to health facilities

Take action to ensure that health facility personnel have easy access to the standard case definitions specified by the national level for reporting priority diseases and conditions to the LGA level and know how to use them. Some countries have prepared and disseminated them in the form of poster while others prepared them as a small pocket size booklet and disseminated to all health staff seeing patients.

Standard case definitions for the priority diseases for the integrated disease surveillance are in Annex 1A and also available in section 9 these guidelines

1.1.2 Signs and symptoms for use in simplified case definitions at the community level

Involving the community in plans to improve surveillance and response procedures in the LGA is of paramount importance. If the community does not know how to notify health authorities when priority diseases or unusual health events occur, suspected cases will not be known at the health facility probably until it is too late, and these cases will not be reported.

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

Being prepared to respond effectively to the community reports will encourage the community to participate in the system. Effective feedback to community encourages the community to participate in the surveillance and response activities
A list of simplified case definitions for use at the community level is in Annex 1B of this section.

1.2 Update LGA procedures for surveillance and response

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

1.2.1   Update the description of the catchment area

At least annually, update information about the catchment area and include results from a risk assessment. Risk mapping is a tool for identifying and presenting particular risks to the community's health and well-being. This information is used to determine prevention actions to take towards reducing those risks and preventing illnesses and death. Examples of potential risks include sources of contaminated water, lack of urgent transportation to a referral facility for women in childbirth, or potential hazards such as inadequate safety precautions in mining or occupational sites.

To update the catchment area description, make sure you have current information about:
    :

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

- Major public health activities in the area including public, private, and NGO immunization activities, clean water projects, family planning clinics, feeding centres for under-nourished children, information related to risk factors for non-communicable diseases and so on.

- List five to ten current leading public health problems treated in all health facilities in the LGA including data from health care facilities owned privately, faith-based, NGO and other agencies.

- Create a regular forum to discuss surveillance and response activities of the priority health events with LGA health stakeholders. This could be done through a monthly or quarterly meeting. The opportunity could be used to provide feedbacks that include surveillance data reported from their institutions.

1.2.2 Update the list of reporting sites in the LGA

Identify all of the health facilities, Points of Entry (PoE) and any other location in the LGA required to report surveillance data or events to the LGA level. Create relationships with private and NGO sites in the LGA and involve them in surveillance activities. Record (and update as needed) health facility and Points of Entry (PoE) locations and names of staff who are responsible for surveillance activities. A sample worksheet for listing the reporting sites and contact focal person at each site is in Annex 1C of this section.

1.2.3 Distribute updated data collection forms, reporting tools and technical 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 LGA (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 LGA meetings with health facilities and other reporting sites.

1.3 Define laboratories for confirming suspected outbreaks and events

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

Laboratory testing is a useful tool for public health surveillance because it helps to know the aetiologic agent of the specific condition and thus confirm the diagnosis. Even well-trained, experienced health providers may be unable at times to make the correct diagnosis. Having laboratory support for the diagnosis increases the likelihood that the diagnosis is correct, and that public health action will be efficient and appropriate.

Laboratory confirmation ensures that surveillance data (for example, the number of cerebrospinal meningitis cases diagnosed according to clinical signs and symptoms) does not result in unnecessary public health actions using the wrong combination of vaccine (A & C) while the serotyping show that over 15 % of the cases are from serotype W135.

Laboratory specimens should arrive in the laboratory in good condition so that processing of the specimen provides reliable results. Specimens should be collected, stored and handled according to disease specification. Minimize delays between collection of the specimen and processing in the laboratory.

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

- Specimen is collected inappropriately, for example, a blood specimen has haemolysed.
- 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.

The disease specific reference tables in Section 9 list recommended laboratory procedures for confirming priority diseases and conditions including:

- The diagnostic test for confirming the disease or condition
- The specimen to be collected
- When to collect the specimen
- How to prepare, store and transport it
- When to expect the results (turn around time)
- Sources for additional information.

Note: Implementing public health measures may be necessary even before final laboratory confirmation is received.

1.3.1 Designate laboratories for inclusion in the network

Annex 1D of this section contains a description of the laboratory functions by level of the health system.

At health facility, LGA and State levels, the focus is on safe collection, handling, transportation and processing of specimens. The local surveillance or laboratory focal person should establish or strengthen routine communication with identified laboratories that receive specimens from your health facility or LGA. The purpose of this routine contact is to strengthen procedures between the health facilities in the LGA 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.

To support sub-national or LGA level laboratories within the network, the national level health system will establish a memorandum of understanding (MOU) with laboratories outside the area or network that have the capacity for specific diagnostic procedures not available locally. The national level should also support the laboratory through advocacy with higher levels in accessing the necessary supplies to collect, handle, store, and ship specimens safely through the network.

1.3.2 Identify laboratories in the network

The surveillance focal person at each level of the health system should maintain an updated list of the laboratories that have the capacity to perform required laboratory testing. A sample worksheet for listing national laboratories for confirming priority diseases and conditions is in Annex 1E of this section. Provide information to all health facilities about the methods for transporting specimens including how to prepare, handle, ship and store the specimens. Make sure to disseminate information about packing and shipping infectious material as directed by national policy.

1.3.2 Identify a LGA laboratory focal point

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

- Preposition specimen collection and transport materials at LGA laboratory level and ensure rapid laboratory diagnostic tests or serological tests are available for detection of priority diseases and hazards (e.g. chemicals)
- Support the health facility in determining when to take a specimen for confirming the suspected case
- Coordinate with the laboratory, as needed, to identify the correct specimen for collection and any special concerns or procedures e.g. SOP for specimen collection and transportation.
- Collect and package the specimen safely or assist the health facility in collecting the specimen.
- Ensure the safe and reliable transport of the specimen from the health facility to the LGA
- Receive the laboratory results from the laboratory and report them promptly to the health facility and state levels.
- Take action with the health facility based on the laboratory report
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1.3.3 Inform laboratories about procedures for confirming priority diseases and conditions

Once a LGA laboratory focal person has been identified, the LGA level focal point should make sure that laboratory confirmation procedures established at the national level are known and followed in the LGA. The designated staff should:

- Ensure that specimen collection and transport materials are pre-positioned (reliably available) at LGA laboratory level. Rapid laboratory diagnostic tests or serological tests available for detection of priority diseases and hazards (for example chemicals) should be available for timely use.
- Support the health facility in collecting the appropriate specimen for confirming the suspected case.
- Coordinate with the laboratory, as needed, to identify the correct specimen for collection and any special concerns or procedures.

- Collect and package the specimen safely or assist the health facility in collecting the specimen.
- Ensure the safe and reliable transport of the specimen from the health facility to the designated laboratory.
- Receive the laboratory results from the laboratory and report them promptly to the health facility and national levels. Also report results to the clinician for patient care.
- Take action with the health facility based on the laboratory report.

1.3.4   Establish laboratory quality control

Coordinate with State 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 obtained.

Annexes to Section 1

- ANNEX 1A: WHO/AFRO recommended case definitions for reporting suspected priority diseases or conditions from the health facility to the LGA

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- ANNEX 1B: Simplified signs and symptoms for case definitions for use at the community level

- ANNEX 1C   List of LGA reporting sites

- ANNEX 1D   Laboratory function by health-system level.

- ANNEX-1E   List of national laboratories for confirming priority diseases, conditions, and events.

ANNEX 1A : WHO/AFRO recommended standard case definitions for reporting suspected priority diseases or conditions and event from the health facility to the LGA.

WHO/AFRO recommends that health facilities use the following surveillance case definitions for reporting suspected cases of priority diseases and conditions to the LGA level. Please refer to the disease-specific guidelines in Section 9.0 for additional information about surveillance for priority diseases and conditions.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Acute haemorrhagic fever syndrome	**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 <u>and</u> 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.*
Acute viral hepatitis	**Suspected case**: Any person with acute illness typically including acute jaundice, dark urine, anorexia, malaise, extreme fatigue, and right upper quadrant tenderness. (Note: infected children are often asymptomatic.) **Confirmed case**: A suspected case that is laboratory confirmed
Adverse events following immunization (AEFI)	A medical incident that takes place after immunization, causes concern and is believed to be caused by the immunization
Anthrax	**Suspected case:** Any person with acute onset characterized by several clinical forms which are: (a) **Cutaneous form**: Any person with skin lesion evolving over 1 to 6 days from a papular through a vesicular stage, to a depressed black eschar invariably accompanied by oedema that may be mild to extensive (b) **Gastro-intestinal:** Any person with abdominal distress characterized by

Anthrax, continued	nausea, vomiting, anorexia and followed by fever (c) **Pulmonary (inhalation):** any person with brief prodrome resembling acute viral respiratory illness, followed by rapid onset of hypoxia, dyspnoea and high temperature, with X-ray evidence of mediastinal widening (d) **Meningeal:** Any person with acute onset of high fever possibly with convulsions, loss of consciousness, meningeal signs and symptoms; commonly noted in all systemic infections, but may present without any other clinical symptoms of anthrax. **AND** has an epidemiological link to confirmed or suspected animal cases or contaminated animal products **Confirmed case:** A confirmed case of anthrax in a human can be defined as a clinically compatible case of cutaneous, inhalational or gastrointestinal illness that is laboratory-confirmed by: (a) isolation of *B. anthracis* from an affected tissue or site; or (b) Other laboratory evidence of *B. anthracis* infection based on at least two supportive laboratory tests. **Note:** *It may not be possible to demonstrate* B. *anthracis in clinical specimens if the patient has been treated with antimicrobial agents.*
Asthma	Any person who presents with chest symptoms (including cough, breathlessness and/or wheezing, often at night) that come and go, vary from day to day, and especially if they cause the patient to wake and even to rise at night, should be suspected of having asthma. If after careful examination no other cause is found and the symptoms persist for some period of time, asthma should be considered
Buruli ulcer (*Mycobacterium ulcerans* disease)	**Suspected case**: A person presenting a painless skin nodule, plaque or ulcer, living or having visited a BU endemic area **Confirmed case:** A suspected case confirmed by at least one laboratory test (ZN for AFB, PCR, culture or histology)
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.

Dengue Fever	**Dengue Fever Suspected case:** Any person with acute febrile illness of 2-7 days duration with 2 or more of the following: headache, retro-orbital pain, myalgia, arthralgia, rash, haemorrhagic manifestations, leucopenia.
	Dengue Fever Confirmed case: A suspected case with laboratory confirmation (positive IgM antibody, rise in IgG antibody titres, positive PCR or viral isolation).
	Dengue Haemorrhagic Fever: A probable or confirmed case of dengue with bleeding tendencies as evidenced by one or more of the following: positive tourniquet test; petechieae, ecchymoses or purpura; bleeding: mucosa, gastrointestinal tract, injection sites or other; haematemesis or melaena; and thrombocytopenia (100 000 cells or less per mm3) and evidence of plasma leakage due to increased vascular permeability, manifested by one or more of the following: 20% rise in average haematocrit for age and sex, 20% drop in haematocrit following volume replacement therapy compared to baseline, signs of plasma leakage (pleural effusion, ascites, hypo-proteinaemia).
	Dengue Shock Syndrome: All the above criteria, plus evidence of circulatory failure manifested by rapid and weak pulse, and narrow pulse pressure ($\leq$ 20 mm Hg) or hypotension for age, cold, clammy skin and altered mental status.
Diabetes	**Suspected new case**: Any person presenting with the following symptoms:
	▪ Increased thirst
	▪ Increased hunger
	▪ Frequent urination
	Confirmed new case: Any person with a fasting venous plasma glucose measurement of $\geq$ 7 mmol/L (126 mg/dl) or capillary glucose $\geq$ 6.1 mmol/L (110 mg/dl)
	Or
	Any person with a non-fasting venous plasma glucose measurement of $\geq$ 11.1mmol/L (200 mg/dl) or capillary glucose $\geq$ 11,1 nnik>k (200 mg/dl)
	Report only the first lab-confirmed diagnosis of the patient
Diarrhoea with blood (dysentery)	**Suspected case**: A person with diarrhoea with visible blood in stool.
	Confirmed case: Suspected case with stool culture positive for *Shigella dysenteriae* type 1.
Diphtheria	**Probable Case** Clinical illness[1] in the absence of laboratory confirmation or epidemiological linkage to a laboratory-confirmed case.
	Confirmed Case
	Clinical illness[1] or systemic manifestations compatible with diphtheria in a person with an upper respiratory tract infection or infection at another site (e.g., wound, cutaneous) **plus** at least one of the following:
	Laboratory confirmation of infection:
	▪ Isolation of Corynebacterium diphtheriae with confirmation of toxin from an appropriate clinical specimen including the exudative membrane **OR**
	▪ Isolation of other toxigenic corynebacteria (Corynebacterium ulcerans or

	Corynebacterium pseudotuberculosis) from an appropriate clinical specimen, including the exudative membrane **OR**
	▪ Histopathologic diagnosis of diphtheria
	EPIDEMIOLOGIC link (contact within 2 weeks prior to onset of symptoms) to a laboratory-confirmed case.
Dracunculiasis	**Suspected case**: A person presenting a skin lesion with itching or blister living in endemic area of Guinea worm. **Confirmed case**: At the last phase of the programme, confirmation of last cases by knowledgeable health staff is required. Follow national guidelines for definition of confirmed case.
Foodborne Illnesses	**Suspected case**: 2 or more people present with similar symptoms who consumed common food or drink **Confirmed case**: A laboratory confirmed case of a specific agent with a link to a common food or drink source. **Note:** *A foodborne illness is defined according to the specific agent causing the disease (for example, cholera, hepatitis A, salmonellosis, shigellosis).*
Human influenza caused by a new subtype	**Suspected H5N1 case**: Any person presenting with unexplained acute lower respiratory illness with fever (>38 ºC) and cough, shortness of breath or difficulty breathing **AND** one or more of the following exposures within the 7 days prior to symptom onset: *a)* Close contact (within 1 meter) with a person (e.g. caring for, speaking with, or touching) who is a suspected, probable, or confirmed H5N1 case; *b)* Exposure (e.g. handling, slaughtering, de-feathering, butchering, preparation for consumption) to poultry or wild birds or their remains or to environments contaminated by their faeces in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month; *c)* Consumption of raw or undercooked poultry products in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month; *d)* Close contact with a confirmed H5N1 infected animal other than poultry or wild birds; *e)* Handling samples (animal or human) suspected of containing H5N1 virus in a laboratory or other setting. **Confirmed H5N1 case**: A person meeting the criteria for a suspected case **AND** positive laboratory results from a laboratory whose H5N1 test results are accepted by WHO as confirmatory.

Human influenza caused by a new subtype, continued	**Suspected pandemic (H1N1) 2009 virus infection:** An individual presenting with influenza-like-illness (sudden onset of fever > 38 °C and cough or sore throat in the absence of another diagnosis) with a history of exposure to a pandemic (H1N1) 2009 virus. **Confirmed pandemic (H1N1) 2009 virus infection:** An individual with a laboratory-confirmed pandemic (H1N1) 2009 virus infection by one or more of the following tests: PCR; viral culture; 4-fold rise in pandemic (H1N1) 2009 virus-specific neutralizing antibodies.
Hypertension	**Suspected new case at first visit:** Any individual presenting with a resting blood pressure measurement (based on the average of 3 readings) at or above 140 mm Hg for systolic pressure, or greater than or equal to 90 mm Hg for diastolic pressure. **Confirmed case:** Any individual presenting on at least two occasions with a resting blood pressure measurement (based on the average of 3 readings) at or above 140 mm Hg for systolic pressure, or greater than or equal to 90 mm Hg for diastolic pressure.
Influenza-like Illness (ILI)	**Influenza-like Illness:** A person, child or adult with: ▪ Sudden onset of fever > 38 ℃ 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).
Lassa and Crimean-Congo Haemorrhagic Fevers (CCHF)	**Suspected case of CCHF**: Illness with sudden onset of fever, malaise, weakness, irritability, headache, severe pain in limbs and loins and marked anorexia. Early development of flush on face and chest and conjunctival infection, haemorrhagic enanthem of soft palate, uvula and pharynx, and often fine petechial rash spreading from the chest and abdomen to the rest of the body, sometimes with large purpuric areas. **Confirmed case of CCHF**: A suspected case with laboratory confirmation (positive IgM antibody, PCR, viral isolation or IgG seroconversion by ELISA or IFA) or epidemiologic link to confirmed cases or outbreak. **Suspected case of Lassa Fever**: Illness with gradual onset with one or more of the following: malaise, fever, headache, sore throat, cough, nausea, vomiting, diarrhoea, myalgia, chest pain hearing loss and a history of contact with excreta of rodents or with a case of Lassa Fever **Confirmed case of Lassa Fever:** A suspected case that is laboratory confirmed (positive IgM antibody, PCR or virus isolation) or epidemiologically linked to a laboratory confirmed case.
Leprosy	**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 Multi Drug Therapy (MDT).
Lymphatic Filariasis	**Suspected case**: Resident of an endemic area with a clinical sign of hydrocoele or lymphoedema for which other causes of these findings have been excluded. **Confirmed case:** A person with positive laboratory diagnosis of microfilaremia in blood smear, filarial antigenaemia or positive ultrasound test.
Malaria	**Uncomplicated malaria**: Any person with fever or history of fever within 24 hours; without signs of severe disease (vital organ dysfunction) is diagnosed clinically as malaria. **Confirmed uncomplicated malaria**: Any person with fever or history of fever within 24 hours; and with laboratory confirmation of diagnosis by malaria blood film or other diagnostic test for malaria parasites. **Unconfirmed severe malaria** Any patient hospitalized with severe febrile disease with accompanying vital organ dysfunction diagnosed clinically. **Confirmed severe malaria** Any patient hospitalized with *P. falciparum* asexual parasitaemia as confirmed by laboratory tests with accompanying symptoms and signs of severe disease (vital organ dysfunction) diagnosed through laboratory.
Malnutrition	**Low birth weight newborns:** Any new born with a birth weight less than 2500 grams (or 5.5 lbs) **Malnutrition in children:** - Children under five who are underweight (indicator: weight for age<-2 ZScore) - Children 6 to 59 months with MUAC<11.5 cm (high risk of mortality) - Bilateral pitting oedema **Malnutrition in pregnant women:** Pregnant women given birth to low birth weight babies (birth weight < 2.5 Kg) (poor nutritional and health status of the women, can predict which population groups may benefit from improved antenatal care of women and neonatal care for infants).
Maternal Deaths	The death of a woman while pregnant or within 42 days of the delivery or termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

Measles	**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.
Meningococcal Meningitis	**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.
Neonatal tetanus	**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.
New AIDS Cases	WHO/AFRO recommends that countries use either Bangui or Abidjan HIV/AIDSR case definitions. A positive ELISA for confirming HIV and a rapid test for confirming the positive results are sufficient for an epidemiologic case definition for HIV Infection.
Noma	**Suspected new case**: Any child with a mouth ulcer and other warning signs such as; malnutrition, poor hygiene, recent illness from; measles, persistent diarrhoea, or malaria should be regarded as a potential noma case. **Confirmed new case**: Any person with a gangrenous disease which starts as gingival ulceration and spreads rapidly through the tissues of the mouth and face, destroying the soft and hard tissues.
Onchocerciasis	**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).
Plague	**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.

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.
Rabies	**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

Severe Acute Respiratory Infections (SARIs)	**Severe acute respiratory infection (persons ≥ 5 years old):** Any severely ill person presenting with manifestations of acute lower respiratory infection with:
	
	    ▪ Sudden onset of fever (>38ºC) AND
	
	    ▪ Cough or sore throat AND
	
	    ▪ Shortness of breath, or difficulty breathing
	
	    ▪ With or without Clinical or radiographic findings of pneumonia
	
	OR
	
	Any person who died of an unexplained respiratory illness.

Severe Acute Respiratory Syndrome (SARS)	**Suspected case of SARS**: An individual with:
	
	  1. A history of fever, or documented fever ≥ 38 °C **AND**
	
	  2. One or more symptoms of lower respiratory tract illness (cough, difficulty breathing, shortness of breath) **AND**
	
	  3. Radiographic evidence of lung infiltrates consistent with pneumonia or ARDS or autopsy findings consistent with the pathology of pneumonia or ARDS without an identifiable cause **AND**
	
	  4. No alternative diagnosis can fully explain the illness.
	
	Confirmed case of SARS: An individual who tests positive for SARS-CoV infection by the WHO recommended testing procedures.

Severe Pneumonia in Children under 5	**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 may not be feasible in most LGAs.
Sexually transmitted infections	**Genital ulcer syndrome (non-vesicular):** **Suspected case**: Any male with an ulcer on the penis, scrotum, or rectum, with or without inguinal adenopathy, or any female with ulcer on labia, vagina, or rectum, with or without inguinal adenopathy. **Confirmed case:** Any suspected case confirmed by a laboratory method. **Urethral discharge syndrome:** **Suspected case**:Any male with urethral discharge with or without dysuria. **Confirmed case**:*Urethral discharge syndrome*: A suspected case confirmed by a laboratory method (for example Gram stain showing intracellular Gram-negative diplococci).
Shistosomiasis	**URINARY SCHISTOSOMIASIS** *Suspected:* Any person with blood in urine *Confirmed:* A person with blood in urine **or** with positive reagent strip for haematuria **and** with characteristic parasite eggs in urine (microscope). **INTESTINAL SCHISTOSOMIASIS:** *Suspected:* A person with non-specific abdominal symptoms, blood in stool, hepato (spleno) megaly *Confirmed:* A person with eggs of *S. mansoni*, *S. japonicum, S. mekongi* or *S. intercalatum* in stools (microscope).
Smallpox (*Variola*)	**Suspected case**: An illness with acute onset of fever $\geq 38.3\,^{\circ}$C ($101\,^{\circ}$F) followed by a rash characterized by vesicles or firm pustules in the same stage of development without other apparent cause. **Probable case:** A case that meets the clinical case definition, is not laboratory confirmed, but has an epidemiological link to a confirmed or probable case. **Confirmed case:** A clinically compatible case that is laboratory confirmed.
Sickle Cell Disorder	**Suspected case:** Any person, especially infants and children, who present to the health services with typical painful **hand and foot syndrome,** joint pain with or without fever should be suspected of having SCD. Such patients should be examined with care and if no other cause is found Emmel test should be performed in case of known or unknown parental SCD traits.

	Confirmed case: SCD is confirmed if test positive or any Haemoglobin electrophoresis with high Haemoglin S or C percentages

Soil Transmitted Helminths	**Ascariasis:**
	    Suspected: Abdominal or respiratory symptoms with history of passing worms.
	
	    Confirmed: suspected case, **and p**assage of Ascaris lumbricoides (anus, mouth, nose), **or p**resence of Ascaris lumbricoides eggs in stools
	
	Hookworm infection
	    Suspected: Severe anaemia for which there is no other obvious cause.
	
	    Confirmed : suspected case and presence of hookworm ova in stools.
	
	Trichuriasis
	    Suspected: Bloody, mucoid stools.
	
	Confirmed: suspected case, **and p**resence of T. trichiura eggs in stools.

Snake bite	• *Suspected:* Not applicable • *Confirmed:* A person who is visibly bitten by a snake and/or injury from snakebite
Trachoma	**Suspected case**: Any patient with red sticky eyes who complains of pain and itchiness of the eyes. **Confirmed case:** Any patient with red sticky eyes who complains of pain and itchiness of the eyes where examination of the eyes confirms one of the stages of Trachoma infection according to the **WHO Simplified Trachoma Grading System**.
Human African Trypanosomiasis	**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.
Tuberculosis	**Suspected case**: Any person with a cough of 3 weeks or more. **Confirmed case**: *Smear-positive pulmonary* TB: a) a suspected patient with at least 2 sputum specimens positive for acid-fast bacilli (AFB), or b) one sputum specimen positive for AFB by microscopy and radiographic abnormalities consistent with active PTB as determined

	by the treating medical officer, or c) one positive sputum smear by microscopy and one sputum specimen positive on culture for AFB.
	Smear negative PTB: a patient who fulfils all the following criteria: a) two sets taken at least 2 weeks apart of at least two sputum specimens negative for AFB on microscopy, radiographic abnormalities consistent with PTB and a lack of clinical response despite one week of a broad spectrum antibiotic, a decision by a physician to treat with a full course of anti-TB chemotherapy, or b) a patient who fulfils all the following criteria: severely ill, at least two sputum specimens negative for AFB by microscopy, radiographic abnormalities consistent with extensive pulmonary TB (interstitial and diarrhoea), a decision by a physician to treat with a full course of anti-TB chemotherapy, or c) a patient whose initial sputum smears were negative, who had sputum sent for culture initially, and whose subsequent sputum culture result is positive.
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.
Whooping Cough (Pertusis)	**Suspected case** Cough illness lasting at least 2 weeks with either paroxysms of coughing, inspiratory "whoop", or post-tussive vomiting without other apparent cause **Confirmed case:** A clinically compatible case that is laboratory-confirmed or epidemiologically linked to a laboratory confirmed case
Yellow fever	<u>**Suspected case**</u>: Any person with acute onset of fever, with jaundice appearing within 14 days of onset of the first symptoms. <u>**Probable case:**</u> A suspected case **AND** One of the following ▪ Epidemiological link to a confirmed case or an outbreak ▪ Positive post-mortem liver histopathology <u>**Confirmed case**</u>: A probable case **AND** One of the following

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

ANNEX 1B: Simplified signs and symptoms for case definitions for use at community level

Inform community leaders, community health workers, traditional healers, birth attendants, and health workers who conduct outreach activities in hard-to-reach areas about the priority diseases and conditions under surveillance in your area. Use signs and symptoms of simplified case definitions such as the following to help the community to recognize when they should refer a person with these signs for treatment and notify the health facility.

Examples of how signs and symptoms of the simplified case definitions may be described at the community level	
Acute flaccid paralysis	Any child with a sudden onset of acute paralytic disease
Acute watery diarrhoea	Any person with 3 or more loose stools within the last 24 hours and a danger sign *or dehydration. (*Danger signs include lethargy, unconsciousness, vomits everything, convulsions, and in children less than 5, unable to drink or breast-feed)
Adverse event following immunization (AEFI)	Any unusual event that follows immunization that is thought to be caused by the vaccine
Cholera	Any person 5 years of age or more with lots of watery diarrhoea
Diarrhoea in children less than 5 years of age	Any child who has three or more loose or watery stools in the past 24 hours with or without dehydration
Diarrhoea with blood (*Shigella*)	Any person with diarrhoea and visible blood in the stool
Dracunculiasis	Any person exhibiting or having a history of a skin lesion with the emergence of a worm
Hepatitis	Any person with fever and yellowing in the white part of the eyes or yellowing of the skin within two weeks of onset of first symptoms
Influenza-like Illness (ILI)	Any person with fever and cough or sore throat or nasal discharge
Leprosy	Any person with light or reddish skin lesions with definite loss of sensation
Malaria	Any person with fever in a malaria endemic area. Any under five child who has an illness with high fever and a danger sign* (*Danger signs include lethargy, unconsciousness, vomits everything, convulsions, and in children less than 5, unable to drink or breast-feed)

Examples of how signs and symptoms of the simplified case definitions may be described at the community level	
Measles	Any person with fever and rash
Meningococcal meningitis	Any person with fever and neck stiffness
Neonatal tetanus	Any newborn who is normal at birth, and then after 2 days, becomes stiff and unable to suck or feed or has convulsions.
Onchocerciasis	Any person in an endemic area with fibrous nodules under the skin
Plague	Any person with painful swelling under the arms or in the groin area. In an area known to have plague, any person with cough, chest pain and fever.
Pneumonia	Any child less than 5 years of age with cough and fast breathing or difficulty in breathing.
Rabies	Any person with a sense of apprehension, headache, fever, malaise and indefinitive sensory changes often referred to the site of a preceding animal bite. Excitability and hydrophobia are frequent symptoms
Sexually transmitted infections (STIs)	Any person male or female who has an urethral/vaginal discharge or genital ulcer
Tuberculosis	Any person with cough for 3 weeks or more
Typhoid fever	Any person with a prolonged fever during the previous 3 weeks or more
Viral hemorrhagic fevers	Any person who has an unexplained illness with fever and bleeding or who died after an unexplained severe illness with fever and bleeding

ANNEX 1C   List of LGA reporting sites

Record information for contacting the health workers who provide information to the LGA related to surveillance and outbreak, events detection. Include, for example, community health workers, trained birth attendants, village leaders and public safety officials. This list is to be updated regularly to add new sites and delete defunct or non-participating sites.

EXAMPLE:

Name of health facility or point of patient contact with health service	Address or location of facility or point of contact	Designated focal person for surveillance and response	Telephone or facsimile number (or other contact information such as e-mail)
Lima Health Centre	*Box 123 Mlima Zone*	*Dr. Moyo*	*Tel: 123-458 or send message by railroad's daily contact with Mlima station*

ANNEX 1D *Laboratory functions by health system level*

Level	1.0 Collect	2.0 Confirm	3.0 Report
Community or Health Facilities	• Use standardized case definitions to determine initiation of collection process • Assist First Contact Laboratory in specimen collection within approved guidelines • Document specimens with patients' complete clinical history and description • Transport specimens to First Contact Laboratory and Referral Laboratory within approved guidelines	• Use standardized case definitions to initiate confirmation process as part of an outbreak investigation • Handle specimens within approved guidelines	• Record collection of specimens
LGA, State	• Communicate collection policies and procedures to providers • Request additional specimen collection by laboratory or providers, as needed • Store specimens within approved conditions pending transport or additional studies • Direct additional collection as needed based on outbreak investigation	• Perform laboratory studies for presumptive diagnosis as appropriate: microscopy, staining, microscopy, RDT • Store representative slides from the outbreak as needed • Observe changes in trends during routine analysis of laboratory results	• Record laboratory results • Provide results to clinical staff and patients • Report results to local epidemiology offices • Report observed changes in trends during routine analysis of laboratory results • Use summary information in response to out breaks
National Referral Laboratory *(some laboratories may function as First Contact and as Referral Laboratories)*	• Set collection policies and procedures with national epidemiology office and national reference laboratories • Distribute specimen collection kits for special surveillance activities • Request additional specimen collection by laboratory or providers, as needed • Store specimens within approved conditions pending transport or additional studies	• Set confirmation policies and procedures with national epidemiology office and national reference laboratories • Perform laboratories studies for confirmation as appropriate: culture, isolation, serogroup identification, antimicrobial susceptibility, serology • Store representative isolates from the outbreak as needed • Observe changes in trends during routine analysis of laboratory results	• Report results and summary data to national epidemiology office • Report laboratory results from screening sentinel populations at target sites
Global Reference Laboratories	• Request additional specimen collection by laboratory or providers, as needed • Direct additional collection as needed based on outbreak investigation	• Perform additional laboratory studies as appropriate	• Report laboratory results to appropriate epidemiology offices • Use summary information in response to outbreaks

ANNEX 1E: List of national laboratories for confirming priority diseases and conditions

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

EXAMPLE:

Name of disease	Available laboratory tests	Name, address, and phone number for laboratory
Polio	*Stool culture* *Isolation of polio virus from stool*	*University of Maiduguri Teaching Hospital, Maiduguri, Borno State* *Univeristy College Hospital Ibadan, Oyo State*
Cholera	*Stool culture* *Isolation of V. cholerae and 01 serotype polyvalent*	*Central Public Health Laboratory Lagos* *Tertiary Hospitals in the country*
Meningitis	*Microscopy, latex, culture and antibiogram*	*Central Public Health Laboratory, Lagos*
HIV	*ELISA*	*All tertiary hospitals* *Central Public Health facilities* *Most Secondary health facilities*
Tuberculosis	*Microscopic examination*	*Dots sites* *All tertiary hospitals* *Central Public Health facilities* *Most Secondary health facilities*
Measles	*Serology test (presence of IgM antibody to measles virus in serum)*	*Central Public Health Laboratory,Lagos* *NE-Specialist Hospital Gombe* *NC-Maitama LGA Hospital* *NW-Yusuf Dantsoho Hospita, Kaduna*
Human influenza caused by a new subtype	RT-PCR	AI laboratory, Asokoro LGA hospital, Abuja
Lassa fever	Serology test (IgM antibody to Lassa virus)	Lagos University Teaching Hospital Lagos
SARS	Confirmed positive PCR for SARS virus	University College Teaching Hospital, Ibadan, Oyo state
Yellow Fever	Serology test (IgM antibody to yellow fever virus) Viral Isolation	*Central Public Health Laboratory,Lagos* *NE-Specialist Hospital Gombe* *NC-Maitama LGA Hospital* *NW-Yusuf Dantsoho Hospital Kaduna*

Section 2
Report priority diseases, conditions and events

This section describes how to:
- Report immediately priority diseases, conditions and events
- Record information in clinic registers or patient charts
- Use standard methods for reporting diseases
- Report routine summary information for other diseases of public health importance
- Improve routine reporting practices

2.0 Report priority diseases, conditions and events

Ensuring reliable reporting of surveillance data throughout the system is important so that program managers, surveillance officers, IHR focal points, Health staff at Point of Entry (PoE) and other health care staff can use the information to:

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

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

National policy determines whether the data from the LGA and health facilities are reported immediately, weekly, monthly, or quarterly. The recommendations about when to report will depend on specific disease control activities in the country.

These guidelines recommend two kinds of reporting:

- *Immediate reporting*: Immediate reporting is indicated when an epidemic-prone disease or other public health emergency is suspected or is otherwise required under the International Health Regulations. It allows for timely action to be taken to prevent the reemergence or rapid transmission of epidemic prone diseases or events, especially diseases due to highly pathogenic and lethal infectious, chemical or radio nuclear agents.

    Report information about an individual case when an epidemic-prone disease and other events with potential public health emergencies of international concern are suspected and requires immediate notification. Also report case-based information for diseases targeted for elimination or eradication according to programme requirement.

> *Note: Some epidemic-prone diseases have specific reporting requirements depending on national policy. For example, Meningitis cases and deaths should be reported weekly.*

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

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

Name of disease, conditions and events	When to report a suspected outbreak/events
For these diseases or conditions, with asterix (*) a single suspected case is a suspected outbreak: Acute flaccid paralysis (AFP)* Cholera* Diarrhoea with blood (*Shigella*) Dracunculiasis Measles *(elimination)* Neonatal tetanus Plague* Viral hemorrhagic fever (Lassa) * Yellow fever* Adverse events following immunization (AEFI) Maternal death Human influenza caused by a new Subtype * Dengue fever* Cluster of SARI * Smallpox* Anthrax* Potential PHEIC (infectious, zoonotic, food borne, chemical, radio nuclear or due to an unknown condition)	• Report case-based information immediately to the LGA as soon as an outbreak is suspected -- Make the initial report by fastest means possible (telephone, facsimile, e-mail, radiophone) -- Follow up with a written report of the case-based information recorded on a form • Report summary information weekly/monthly. Enter "zero" when no cases were suspected or confirmed during the reporting period. Immediate notification to the National IHR NFP (Epidemiology Division, FMoH) using the fastest means of communication
For these diseases, report a suspected outbreak when the threshold is crossed: Measles *(non-elimination)* Meningococcal Meningitis Malaria	• Report suspected measles outbreak when 5 or more cases are suspected in one month. • Report suspected meningitis outbreak when the alert threshold is crossed. (See Section 8.0 for specific guidance on alert and epidemic thresholds for meningitis.) • Malaria epidemics are declared if agreed thresholds are reached in two consecutive weeks after confirmatory investigation

For these diseases, report monthly or quarterly summaries of cases and deaths to the next level	• Health facilities report summary totals to the LGA.
Diarrhoea with severe or some dehydration in children less than 5 years old Leprosy (report quarterly) Malaria Typhoid fever New AIDS cases Pneumonia and severe pneumonia in children less than 5 years old Sexually Transmitted Infections (STIs) MDR and XDR TB monthly, other TB quarterly	• LGA reports summary totals to the State or FMoH (EPID / HER Division). • Observe alert and epidemic thresholds for specific diseases during analysis of monthly summary reports.
Acute viral hepatitis	
Buruli ulcer	
Diabetes mellitus	
Hypertension	
Influenza-like illness	
Injuries (Road Traffic Accidents)	
Lymphatic Filariasis	
Malnutrition in children under 5 years	
Mental health (Epilepsy)	
Onchocerciasis	
Human African Trypanosomiasis	
Trachoma	
Underweight Newborns (less than 2500 g	

2.2 Record information in clinic registers or patient charts

Each LGA or health facility has its own procedures for recording the patient's diagnosis (Annex 2A).

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

To collect daily summaries, a clinician, nurse, Health record officer or other health care worker records the diagnosis in the ward register. Other staff such as nurse or record clerk visits the ward daily to tally the cases and deaths for each diagnosis.

Each month, the daily totals are summarized and reported to the LGA level as required. Another method is when the clinician records the patient's diagnosis in a patient's record; other health workers review the charts and tally cases and deaths to compile weekly or monthly summaries.

To ensure correct recording of cases of priority diseases and conditions:

• Take steps to ensure that all health workers know the standard case definitions recommended by national policy. Establish or modify existing procedures so that all

health workers will be able to apply the standard case definitions in detecting or suspecting cases or outbreaks.

- Highlight those diseases or conditions that require immediate reporting for case-based surveillance with staff. For example, all the health workers should be aware of the epidemic-prone diseases for which one case is a suspected outbreak requiring immediate action.

- As soon as an epidemic-prone disease is suspected, ask the patient about additional cases in the home, work place or community.

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

2.2.1 *Enhance linkages to strengthen community-based surveillance*

A community-based surveillance system relies on the community members' capacity to identify and report public health problems to the nearest health facility or to the district health office. In this system, trained surveillance informants identify and report events in the community that have public health significance. Community informants report to the health facility or, in the case of a serious event, directly to the district authorities.

Example: *A community surveillance informant hears of several cases of acute watery diarrhea with vomiting in the community. The informant suspects cholera and reports the rumor to the local health facility and to the district level heath officer by text messaging. Members of the rapid response team (RRT) travel to the community to verify and investigate the possible outbreak, and, based on the investigation results, implement control and prevention measures. The outbreak is quickly contained thanks to the early warning from the community-based surveillance liaison.*

Identify sources in the community who will be able to report suspected cases of priority diseases to the health facility. Examples of community sources include:
- Community Pharmacists
- School teachers
- Private clinics
- Community health committees
- Village leaders
- Religious leaders
- Traditional healers
- Trained birth attendants or other community health workers
- Patent medicine vendors / dealers

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

The LGA can organize community-based surveillance informants by:

- Working with community leaders to identify members of the community to receive relevant training.

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

- Involve community surveillance informants in risk mapping, emergency simulation exercises and risk communication during outbreaks.

- Disseminate alert and epidemic thresholds

Please refer to the list in Annex 1B of simplified signs and symptoms to use in case definitions for community surveillance.

2.3 Use standard methods for reporting priority diseases and events

In an integrated system, streamlining reporting allows for data to be reported efficiently by using a minimum number of forms and reporting contacts, rather than requiring health facilities to provide reports using several forms for different disease control and prevention programs. Data about the priority diseases can be reported on a single form, if feasible. Report case-based information verbally or through the available fastest means and then provide written information on a case reporting form. Summary data is reported on weekly and monthly summary reporting forms.

2.3.1 Immediately report epidemic-prone diseases or unusual events

Immediate reporting is required for certain diseases because prompt action can be taken to control the wider transmission of the disease and prevent additional cases from occurring.

When an immediately reportable disease or outbreak of any priority disease is suspected, report the patient's location, immunization history (where applicable), date of onset of symptoms, and other relevant risk factors to the next level. The verbal or written notification should reach the LGA within 24 hours from when the case was first seen at the health facility.

Also report immediately any unusual health event reported by the community such as a large number of deaths with fever that did not respond to usual treatment for causes of

fever in the area. Report information about the health event verbally by telephone/SMS or radiophone or use an electronic method such as e-mail or fax.

2.3.2   Report case-based data using recommended form

If an immediate reportable disease, condition or other public health emergency is suspected:

- Make the initial report by the fastest means possible (telephone, text message, e-mail, radiophone). The health facility should contact the LGA health authority immediately and provide information about the patient.

- Follow up the initial verbal report with a written report of the case-based reporting form. A sample case-based reporting form for recording case-based information is in Annex 2B at the end of this section. If a computer or other electronic device is available for surveillance or case management, complete and submit the form electronically to the next level.

- If a laboratory specimen is requested at this time, make sure that the patient's identifying information matches the information on the case-based reporting form. A sample laboratory form is included in Annex 2C.

- Disease-specific case-based reporting forms for particular diseases of concern (cholera, VHF, maternal death, and MDR/XDR TB) are in the annex at the end of Section 9. These forms may be used to begin gathering initial information for the case investigation.

   Note: Some epidemic-prone diseases may have specific reporting requirements depending on national policies. Please refer to disease-specific requirements in Section 9 of this guide.

- If a potential Public Health Emergency of International Concern (PHEIC) is suspected, notify the National IHR Focal Point using the fastest means of communication. A copy of the IHR decision instrument is in Annex 2 J at the end of this section.

- For Emergencies and diseases with epidemic potential detected at Points of Entry, report immediately to the next higher level. Provide a copy of the report to the national for the National IHR Focal Point to assess using the decision algorithm. Include yellow fever vaccination for those cases originating from endemic or risk areas.

If a verbal report cannot be made, the case reporting form may be the first contact that the LGA receives about the case. An example of the form and instructions for completing it are in Annex 2B at

the end of this section. The case-based reporting form contains important information about the case, including:

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

The health worker who completes the form should record his or her name and the date the form was sent to the LGA. Make two additional copies of the form (photocopy, carbon copy or hand-written). Submit the original to the LGA. Keep one copy at the health facility. Use the second copy as a laboratory transmittal slip if a laboratory specimen is taken. (Refer to Annex 7 or the disease specific guidelines in Section 9.0 for information about which laboratory tests to request.) Send the copy of the case-based form with the specimen to the laboratory.

2.3.3   Report summary data routinely

Each month, the health facility calculates the total number of cases and deaths due to priority diseases and events seen in the health facility. Separate totals are calculated for out-patient cases and in-patient cases. The summary totals are recorded on a form (Annex 2H) and sent to the LGA level.

The LGA aggregates the totals from all the health facilities that reported and submits LGA summary total to the State and the State sends summary report to FMoH (Epidemiology Division).

2.4   *Improve routine reporting practices*

In some health facilities, more than one person may be responsible for recording information about patients seen in the facility. For example, the clinician records the patient's name and diagnosis in a clinic register. Later in the day, a nurse, health record clerk or any other health worker tallies the number of cases and deaths seen in an outpatient service. The ward nurse tallies the number of hospitalized cases. Each month, a records clerk or statistician calculates summaries for all the diseases and records them in a standard form. In case the health facility is equipped with computers, individual patient records shall be entered, from which the

surveillance subset will be extracted and analyzed to get the required weekly, monthly or quarterly compilations.

2.4.1   Review the flow of information in the health facility

During supervisory visits to reporting sites, make sure that:

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

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

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

If no case of an immediately reportable disease has been diagnosed during the month, record a zero (0) on the reporting form for that disease. If the space is left blank, the staff that receives the report will not know why there is a blank space. Submitting a zero for each immediately reportable disease even if no case was detected during the month, informs the staff at the next level that a complete report has been filed.

2.4.3   Use line lists and summary reporting during outbreaks.
When a limited number of cases of a single disease occur during a specified period of time, report the information about each case on an individual case reporting form.

If more than 5 to 10 cases occur in a specified time, use a line list (Annex 2D) instead of individual case reporting forms to record and report the cases weekly.

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

2.4.4 Monitor access to forms and procedures

Keep a record of IDSR forms and reports received at your level. The record you keep will be an essential data source for calculating indicators for your country's IHR report and for monitoring performance of the IDSR indicators. A sample IDSR Reports and Data Sharing Log Book form is in Annex 2 I.

Periodically check with reporting sites that you supervise (community, health facility, and district) to ensure that the correct forms and procedures are available to staff so they can record and report the required cases of priority diseases and conditions:

- Take steps to ensure that all health workers know the standard case definitions recommended by national policy. Establish or modify existing procedures so that all health workers will be able to apply the standard case definitions in detecting and reporting priority cases, outbreaks or events.

- Highlight with staff those diseases or conditions that require immediate reporting for case-based surveillance including PHEIC and other priority diseases or events of national and regional concern. For example, all the health staff should be aware of epidemic-prone diseases for which a single case is a suspected outbreak requiring immediate action, and of any unusual or unexplained event with potential for affecting human health.

- Review with health staff the role that case-based data plays in determining risk factors and the means of disease transmission or exposure to health risks in a public health event. Make sure the staff has access to a recommended form for reporting case-based information.

- Ensure that the surveillance unit has access to fast communication means (facsimile, telephone, text message, electronic mail, telegrams, personal messages, or other rapid communication means). For the district, specify how the district should notify the regional or national levels and who should be contacted at these levels.

Annexes to Section 2

- ANNEX 2A: Maintaining clinic registers for recording priority diseases and conditions
- ANNEX 2B: Case-based surveillance reporting form (IDSR 001A)
- ANNEX 2C: Case-based Laboratory reporting form (IDSR 001B)
- ANNEX 2D: Line list for reporting case-based information when several cases occur during a short period: IDSR 001C
- ANNEX 2E: Weekly summary reporting form for out - patient cases and in-patient cases and deaths: IDSR 002
- ANNEX 2F: Monthly summary reporting form for out-patient and in-patient cases and deaths: IDSR 003
- ANNEX 2G: Summary Weekly Report under weekly surveillance for out-patient cases and in-patient cases and deaths (health facility to LGA level)
- ANNEX 2H: Summary Weekly Report under weekly surveillance for out-patient cases and in-patient cases and deaths (LGA level to State)
- ANNEX 2I: IDSR reports and data sharing logbook
- ANNEX 2 J: IHR (2005) decision instrument

ANNEX 2A: Maintaining clinic registers for recording priority diseases and conditions

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

- The patient's name , age and gender
- The patient's address
- The patients presenting symptoms
- The patient's diagnosis. This is mainly important for reporting summary information. Use IMCI diagnosis for diarrhoea with dehydration and for pneumonia in children less than 5 years of age
- The patient's status (in-patient or out-patient)
- The date the patient was seen

Some registers include spaces also for recording:

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

ANNEX 2B: Immediate/Case-based surveillance reporting form IDSR001A

WHO/AFRO recommends a generic case-based reporting form that can be used to report written

REPORTING HEALTH FACILITY			REPORTING LGA		REPORTING STATE		
IDENTIFICATION NUMBER					IDSR 001A		
Immediate/ Case-based Reporting Form **From Health Facility/Health Worker to LGA health team**							
Cholera	Dracunculiasis (Guinea Worm)	Neonatal Tetanus	Measles	Meningitis	**Human Influenza caused by new sub type e.g A/H5N1**	Viral Hemorrhagic Fever e.g. Lassa fever	Yellow Fever	Diahrroea with Blood /shigella(Under 5)	Others/specify* e.g. Dengue, SARS, Small pox, Plague, Anthrax etc

Date form received at SMOH or the national level: / / (Date/Month/Year)	
Name of Patient:	

Date of Birth (DOB): / / (Day/Month/Year)	**Age (If DOB unknown):**	Year	Month (if <12)	Day (NNT only)

Sex:		M=Male F=Female	

Patient's Address:		**Urban**		**Rural**	

Settlement/Village	

Ward		**LGA**	**State:**	

Exact residential address:	
If applicable or If the patient is neonate or child, please write full name of mother and father of the patient	

Date Seen at Health Facility: / /	**Date Health Facility notified / / LGA/:**	**Date of Onset:** / /

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

Date of last vaccination:	/ /
	(Measles, Neonatal Tetanus (TT in mother), Yellow Fever, and Meningitis only)
Close contact with infected poultry	1=Yes 2=No
Close contact with suspected or confirmed case of Avian influenza	1= Yes 2 =No
Associated with an outbreak?	1=Yes 2=No

In/Out Patient	1=Inpatient	2=Outpatient	

Outcome	1=Alive	2=Dead	9=Unknown

Final Classification of case	1=Confirmed	2=Probable	3=Discarded	4=Suspect	

Final Classification for Measles	1= Laboratory Confirmed	2= Confirmed by Epidemiological linkage	3=Clinical Compatible	4=Discard	5=Suspect with lab pending

Person completing form Name:		**Signature:**	
Title: **Address:**			

Date form sent to LGA/:   /   /   (Date/Month/Year)   Date Form Received at LGA: /   /   /   Signature

information about individual cases of priority diseases recommended for case-based surveillance. These include:

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

- Diseases targeted for eradication or elimination (Polio (AFP), Dracunculiasis, Lymphatic filariasis, Neonatal tetanus, and Leprosy). Leprosy and reported quarterly

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

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

The sample form on the next two pages has two sections. The top half is on the next page. On the top half, record information about the individual case. This will provide information that can be used to plan a more detailed case investigation. The bottom half of the form is on the page after next and it can be used as a laboratory transmittal slip. It contains spaces where laboratory results and information about the timeliness of the laboratory testing should be recorded. After the health facility or LGA staff completes the top part of the form, a copy of it can be made and included with the specimen, if a specimen has been collected, when it is sent to the laboratory.

Annex 2C: IDSR Case based laboratory reporting form

If Lab Specimen Collected

For Health Facility: If lab specimen is collected, complete the following information and send a copy of this form to the lab with the specimen.							
Date of specimen collection: _____/_____/_____ _____							
Type of specimen:			Stool	Blood		CSF	Other/specify
Date specimen sent to lab: _____/_____/_____							
ID Number:							

For the Lab: Complete this section and return the form to LGA/ health facility or clinician

Date lab received specimen: __/_____/_____					
Specimen Condition:		Adequate		Not adequate	
Disease/Condition:					
Type of Test:					

Result:		+ = Positive	- = Negative	P = pending	
Malaria	P. Faliciparum				
	P. Vivax				
Cholera (culture)					
Cholera direct exam; specify the method used: _____					
Meningitis: N meningitides	Culture				
	Latex				
	Gram stain				
Meningitis: S. pneumonia	Culture				
	Latex				
	Gram stain				
Meningitis: H. influenza	Culture				
	Latex				
	Gram stain				
Shigella dysenteriae	Culture				
	Type	SD Type 1	Other Shigella types		No Shigella

Result:		+ = Positive	- = Negative	I= Indeter.	P=Pending
Viral Detection	Yellow fever (IgM)				
	Measles (IgM)				
	Rubella (IgM)				
	RVF (IgM)				
	Ebola (IgM)				
	Lassa (Ig M)				
	Marburg (IgM)				
	A/H5N1 (RT-PCR)				
Other lab test (specify)	Results:				
Date lab sent results to LGA//health facility:			_____ /_____ /_____		
Name of lab sending results:					
Other pending results:					
Name of lab technician sending the results:			Signature:		
Date LGA/ receive lab results: ____/____/_____			LGA/:		
Date lab results sent to health facility by LGA/: _____/_____/_____					
Date lab results received at the health facility: _____/_____/_____					

Instructions for completing the Immediate/Case Based Reporting Form

For the health facility:

1. Complete the name of the health facility submitting the case-based reporting form.
2. Record the name of the LGA that is receiving the report.
3. Tick the box at the top of the form to indicate which disease is being reported. If the disease or condition is not stated, or its cause is unknown, write the name of the disease or condition (or "unknown") in the blank marked "Other".

4. Record the name of the patient. For a neonatal tetanus case, record the name of the mother.
5. Record the patient's age, if it is known, or the patient's date of birth.
6. Record information about the patient's residence.(Name of the village neighbourhood, ward and LGA that the patients live in).Record information about how to contact the patient or the patient's parents for use at a later time when additional information about the patient's illness may be needed.(Telephone)
7. Record "M" for Male and "F" for Female.
8. Record the date the patient was seen at the health facility and the date the health facility reported the disease or condition to the LGA. (The form should be a follow-up to prompt verbal reporting.)
9. Record the date of onset of the disease, if known.
10. For vaccine preventable diseases, such as AFP, neonatal tetanus, measles, meningitis and yellow fever, obtain an immunization history for the patient. Record the date of the last immunization dose for the reported illness. Decide if the dose was more than 15 days ago. If the immunization was received within the last 15 days, there may not have been an immunization response. Do not count doses that were received within the last 15 days.

   - For meningitis, record if there is a history of vaccination during a mass campaign.
   - For neonatal tetanus, record the number of lifetime doses of tetanus toxoid the mother received up to 15 days before the delivery.

11. Report whether the patient was an out-patient or in-patient at the time the case was reported.
12. Record whether the patient was living or deceased at the time the report was made. If the patient's illness is reported, and the patient later dies, inform the LGA, so that the LGA can change the status on the form.
13. When the investigation of the case is complete, record "confirmed" or "discarded" in the item "Final Classification". When the case is first suspected, record "suspected" as the Final Classification.
14. The health facility staff member who completes the form should sign his or her name and also the date the form was sent to the LGA.

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

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

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

For the laboratory:

17. Record the date the laboratory received the specimen and the condition of the specimen. See Annex 7 in Section 1 for information about ensuring the quality of specimens. If the specimen arrives in poor condition, inform the health facility promptly to let them know a useful laboratory result is not going to be possible. They may decide to send another specimen. Give guidance in ensuring the specimen arrives in adequate condition.

18. Record the results of the laboratory testing according to the prompts on the bottom part of the form.
19. Record the date the results were given (in writing) to the health facility and/or the LGA. As a national policy, results are given to the State/ LGA and theLGA will then inform the health facility.

For the LGA:

20. Unique identification numbers should be used to record cases reported to the LGA. Record the identification number (ID number) in the blank for "ID number"; e. g NIE (Nigeria) Country code, LAS (Lagos) State code, KRD (Ikorodu) LGA code, two digits for year (08 for year 2008) and four digits for case number.
21. When the report is received at the LGA, record the date it was received. If a verbal report was made, report the date of the verbal report.
22. Data should be collated and analysed for local use.
23. Case reporting form should be completed in duplicate and the original forwarded to the state level for data entry and analysis.
24. Laboratory results should also be forwarded to the state

At the State level:
25. Summarise all data from LGAs and analyse for State use
26. Send a completed case reporting form to the National level for data entry and analysis.
27. Send the laboratory results
28. Provide feed-back to the LGAs.

ANNEX 2D: Line list – Reporting from health facility to LGA and for use during outbreaks

Health Facility: _____ Ward _____ LGA: _____ State: _____

Date Sent to LGA:_____ Date received at LGA:_____

Disease or condition:_____

CASE Id No	O=out-patient I=in-patient	*Name*	Village, Town and Neighborhood	Sex	Age[1]	Date seen at health facility	Date onset of disease	Number of doses of vaccine[2] received	Other variable	Other variable	Record date laboratory specimen collected	Record results of laboratory testing	Outcome A=alive D=dead	Comments

- If LGA sends specimens to the laboratory, use the same case ID number in the NIE/ SSS/ LLLYY-NNNN format to identify the specimen.
- If health facility sends the laboratory specimen to the laboratory without passing through the LGA, then use the patient's name to identify the specimen.
- NOTE: If more than 100 cases occur in a week at a health facility (e.g., for measles, cholera, and so on), do not line list them. Record the total number of cases only. If previously recorded cases die, update their status by completing a new row with "died" in the "Outcome" column and "update record" in the Comments column.

[1] Record age in months up through age 12 months. If patient is more than 12 months old, record age in years.

[2] Exclude doses given within 14 days of onset of the disease.

NIE – Country code, SSS – State Code, LLL – LGA code, YY – Year, NNN – Patient number

Annex 2E: WEEKLY REPORTING OF NEW CASES OF EPIDEMIC PRONE DISEASES AND OTHER PUBLIC HEALTH EVENTS/CONDITIONS UNDER SURVEILLANCE

Year: _____

Week number: ___   **From:** ___/___/_____/   **To:** ___/___/_____/   **Month**   **Year**

State

HFs/LGAs/ States (with cases)	Cerebro-spinal Meningitis			Cholera			Viral hemorrhagic fever (e.g.Lassa fever)			Measles			Yellow fever			Guinea Worm Disease			Human Influenza due to new Subtype			Any Public Health Event of International concern - Specify. (infectious, zoonotic, food borne, chemical, radio nuclear or due unknown condition, etc)		
	Cases	Lab Confirmed	Deaths	Cases	Lab Confirmed	Deaths	Cases	Lab Confirmed	Deaths	Cases	Lab Confirmed	Deaths	Cases	Lab Confirmed	Deaths	Cases	Identification of Worm extracted	Deaths	Cases	Lab Confirmed	Deaths	Cases	Lab Confirmed	Deaths
Total																								
Case fatality rate																								

Date of submission of this report: ___/___/_____/

Officer in charge: _____ **Signature**_____

TO BE COMPLETED IN DUPLICATE

LGA LEVEL
ROUTINE MONTHLY NOTIFICATION FORM: IDSR 003

LGA:_____ State:_____

Month [ ][ ][ ][ ]   Year [ ][ ][ ][ ]   No. health facilities in LGA [ ][ ][ ][ ]   No. health facilities in LGA reporting [ ][ ][ ][ ]

DISEASE	Cases out-patients								Cases in-patients								Total cases in & out patient	DEATHS							
	0-28 days	1-11 months	12-59 months	5-9 years	10-19 years	20-40 years	>40 years	Total	0-28 days	1-11 months	12-59 months	5-9 years	10-19 years	20-40 years	>40 years	Total		0-28 days	1-11 months	12-59 months	5-9 years	10-19 years	20-40 years	>40 years	Total
1. Buruli Ulcer																									
2. CSM																									
3. Cholera																									
4. Diarrhoea with dehydration ≤ 5yrs																									
5. Diarrhoea (with blood)																									
6. Diphtheria																									
7. Dracunculiasis (Guinea Worm Disease)																									
8a). Hepatitis A																									
8b). Hepatitis B																									
8c). Hepatitis C																									
9. Human African Trypanosomiasis (HAT)																									
10. Injuries (Road Traffic Accident)																									
11. Lassa fever (Viral hemorrhagic fever)																									
12. Leprosy																									
13. Lymphatic Filariasis																									
14a) Malaria																									
14b) Malaria (severe)																									
14c) Malaria (Pregnant Women)																									
15. Measles																									
16. Neonatal Tetanus																									
17. New HIV/ AIDS cases																									
18. Onchocerciasis																									
19. Pertussis																									
20. Pneumonia ≤ 5yrs																									
21. Poliomyelitis																									
22. Rabies (Human)																									
23. Severe Acute Respiratory Illness (SARI)																									
24. Schistosomiasis																									
25. Sexually Transmitted Infections (STIs):																									
25a) Vaginal discharge																									
25b) Genital Ulcer																									
25c) Urethral discharge																									
25d) Others STIs																									
26. Trachoma																									
27. Typhoid Fever																									
28. Tuberculosis																									
29. Yellow Fever																									

NON-COMMUNICABLE DISEASES/CONDITIONS/EVENTS

DISEASE	0-28 days	1-11 months	12-59 months	5-9 years	10-19 years	20-40 years	>40 years	Total	0-28 days	1-11 months	12-59 months	5-9 years	10-19 years	20-40 years	>40 years	Total	Total cases in & out patient	0-28 days	1-11 months	12-59 months	5-9 years	10-19 years	20-40 years	>40 years	Total
30. Adverse Events following immunization (AEFI)																									
31. Asthma																									
32. Diabetes Mellitus																									
33. Hypertension																									
34. Malnutrition																									
35. Maternal Deaths																									
36. MNS Disorder (Epilepsy, Schizorphernia depression etc)																									
37. Noma																									
38. Sickle Cell Disorder																									
39. Snake Bite																									
40 Soil Transmitted Helminths																									

Name of Reporting Officer _____   Signature _____   Date _____

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ANNEX 2G: Summary Weekly Report under weekly surveillance for out-patient cases and in-patient cases and deaths (health facility to LGA level)

Health Facility: _____

Catchment Population: _____ inhabitants

				States: _____	Country: _____

LGA: _____

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

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

Analysis, Interpretation and Response

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

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

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

Officer in charge: _____

ANNEX 2H   Summary Weekly Report under weekly surveillance for out-patient cases and in-patient cases and deaths (LGA level to State)

LGA: _____ Population: _____ inhabitants

State: _____

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

Number of Sites (Health facility) that reported on time: _____   Timeliness of reporting: _____   %

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

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

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

Analysis, Interpretation and Response

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

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

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

Officer in charge: _____

ANNEX 2 I: DECISION INSTRUMENT FOR THE ASSESSMENT AND NOTIFICATION OF EVENTS THAT MAYCONSTITUTE A PUBLIC HEALTH EMERGENCY OF INTERNATIONAL CONCERN (Annex II of IHR)

Events detected by national surveillance system (see Annex 1)

A case of the following diseases is unusual or unexpected and may have serious public health impact, and thus shall be notified[a, b]:
- Smallpox
- Poliomyelitis due to wild-type poliovirus
- Human influenza caused by a new subtype
- Severe acute respiratory syndrome (SARS).

OR

Any event of potential international public health concern, including those of unknown causes or sources and those involving other events or diseases than those listed in the box on the left and the box on the right shall lead to utilization of the algorithm.

OR

An event involving the following diseases shall always lead to utilization of the algorithm, because they have demonstrated the ability to cause serious public health impact and to spread rapidly internationally[b]:
- Cholera
- Pneumonic plague
- Yellow fever
- Viral haemorrhagic fevers (Ebola, Lassa, Marburg)
- West Nile fever
- Other diseases that are of special national or regional concern, e.g. dengue fever, Rift Valley fever, and meningococcal disease.

Is the public health impact of the event serious?

Yes → Is the event unusual or unexpected?
No → Is the event unusual or unexpected?

Is the event unusual or unexpected?
Yes
No → Is there a significant risk of international spread?

Is the event unusual or unexpected?
Yes → Is there a significant risk of international spread?
No

Is there a significant risk of international spread?
Yes
No → Is there a significant risk of international travel or trade restrictions?

Is there a significant risk of international spread?
Yes
No

Is there a significant risk of international travel or trade restrictions?
Yes
No → Not notified at this stage. Reassess when more information becomes available.

EVENT SHALL BE NOTIFIED TO WHO UNDER THE INTERNATIONAL HEALTH REGULATIONS

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

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

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

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

<table>
<tr><td rowspan="7" style="writing-mode: vertical-rl">Is the public health impact of the event serious?</td><td></td></tr>
<tr><td>I. Is the public health impact of the event serious?</td></tr>
<tr><td>1. Is the number of cases and/or number of deaths for this type of event large for the given place, time or population?</td></tr>
<tr><td>2. Has the event the potential to have a high public health impact?

THE FOLLOWING ARE EXAMPLES OF CIRCUMSTANCES THAT CONTRIBUTE TO HIGH PUBLIC HEALTH IMPACT:
✓ Event caused by a pathogen with high potential to cause epidemic (infectiousness of the agent, high case fatality, multiple transmission routes or healthy carrier).
✓ Indication of treatment failure (new or emerging antibiotic resistance, vaccine failure, antidote resistance or failure).
✓ Event represents a significant public health risk even if no or very few human cases have yet been identified.
✓ Cases reported among health staff.
✓ The population at risk is especially vulnerable (refugees, low level of immunization, children, elderly, low immunity, undernourished, etc.).
✓ Concomitant factors that may hinder or delay the public health response (natural catastrophes, armed conflicts, unfavourable weather conditions, multiple foci in the State Party).
✓ Event in an area with high population density.
✓ Spread of toxic, infectious or otherwise hazardous materials that may be occurring naturally or otherwise that has contaminated or has the potential to contaminate a population and/or a large geographical area.</td></tr>
<tr><td>3. Is external assistance needed to detect, investigate, respond and control the current event, or prevent new cases?

THE FOLLOWING ARE EXAMPLES OF WHEN ASSISTANCE MAY BE REQUIRED:
✓ Inadequate human, financial, material or technical resources – in particular:
  – Insufficient laboratory or epidemiological capacity to investigate the event (equipment, personnel, financial resources)
  – Insufficient antidotes, drugs and/or vaccine and/or protective equipment, decontamination equipment, or supportive equipment to cover estimated needs
  – Existing surveillance system is inadequate to detect new cases in a timely manner.</td></tr>
<tr><td>IS THE PUBLIC HEALTH IMPACT OF THE EVENT SERIOUS?
Answer "yes" if you have answered "yes" to questions 1, 2 or 3 above.</td></tr>
</table>

Is the event unusual or unexpected?	**II. Is the event unusual or unexpected?**
	4. *Is the event unusual?* THE FOLLOWING ARE EXAMPLES OF UNUSUAL EVENTS: ✓ The event is caused by an unknown agent or the source, vehicle, route of transmission is unusual or unknown. ✓ Evolution of cases more severe than expected (including morbidity or case-fatality) or with unusual symptoms. ✓ Occurrence of the event itself unusual for the area, season or population.
	5. *Is the event unexpected from a public health perspective?* THE FOLLOWING ARE EXAMPLES OF UNEXPECTED EVENTS: ✓ Event caused by a disease/agent that had already been eliminated or eradicated from the State Party or not previously reported.
	IS THE EVENT UNUSUAL OR UNEXPECTED? **Answer "yes" if you have answered "yes" to questions 4 or 5 above.**

Is there a significant risk of international spread?	**III. Is there a significant risk of international spread?**
	6. *Is there evidence of an epidemiological link to similar events in other States?*

	7. *Is there any factor that should alert us to the potential for cross border movement of the agent, vehicle or host?*
	
	THE FOLLOWING ARE EXAMPLES OF CIRCUMSTANCES THAT MAY PREDISPOSE TO INTERNATIONAL SPREAD:
	
	✓ Where there is evidence of local spread, an index case (or other linked cases) with a history within the previous month of:
	  – international travel (or time equivalent to the incubation period if the pathogen is known)
	  – participation in an international gathering (pilgrimage, sports event, conference, etc.)
	  – close contact with an international traveller or a highly mobile population.
	✓ Event caused by an environmental contamination that has the potential to spread across international borders.
	✓ Event in an area of intense international traffic with limited capacity for sanitary control or environmental detection or decontamination.

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

Risk of international restrictions?	**IV. Is there a significant risk of international travel or trade restrictions?**
	8. *Have similar events in the past resulted in international restriction on trade and/ travel?*
	9. *Is the source suspected or known to be a food product, water or any other goods might be contaminated that has been exported/imported to/from other States?*
	10. *Has the event occurred in association with an international gathering or in an area intense international tourism?*
	11. *Has the event caused requests for more information by foreign officials or international media?*
	IS THERE A SIGNIFICANT RISK OF INTERNATIONAL TRADE OR TRAVEL RESTRICTIONS? Answer "yes" if you have answered "yes" to questions 8, 9, 10 or 11 above.

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

ANNEX 2 J: IDSR reports and data sharing logbook

IDSR Reports and Data Sharing Log book							
Country:							
State:							
LGA:							
Surveillance site name:							
Reception Date of the Report or Data set	**Report description: pick one from the list below ***	**Reporting Site name**	**Reported Period ****	**Report form well filled? (Y/N)**	**Report received Timely or Late ?**	**Feedback sent to the reporting site? (Yes/No)**	**Comments**

*

Weekly AFP polio; Weekly Epidemic Prone Diseases; Weekly Influenza sentinel sites and labs findings; Monthly IDSR Aggregated data including malaria and Guinea worm disease;   Monthly Pediatric bacterial Meningitis surveillance data; Monthly Measles and yellow fever lab data; Monthly Measles, yellow fever and NNT case-based data; Monthly Bacteriology lab data; Monthly Rotavirus surveillance data; Quarterly Tuberculosis Report; Quarterly MDR and XDR Tuberculosis Report; Quarterly Leprosy Report; Quarterly Trypanosomiasis Report; Annual HIV Surveillance data, Etc.

**

(Use epidemiologic notation to record the reporting period, for example: W-2010-18 for weekly data, M-2010-12 for monthly data, Q-2010-02 for quarterly data)

Note:
Instructions for completing forms can be printed on the reverse side if a paper form is used or in electronic format if reports are compiled and transmitted by computer

Section 3: Analyse data

This section describes how to:
- Receive, validate and store data from health facilities
- Analyze data by time, place and person
- Compare analysis results with thresholds for public health action
- Draw conclusions from the analysis
- Summarize and use the information to improve public health action

3.0 Analyze data

Organizing and analyzing data is an important function of surveillance. It is not enough to collect, record and report numerical information about illness, death and disability from the catchment area; the data must also be analyzed at each level where it is collected. Analyzing data provides the information that is used to take relevant, timely and appropriate public health action. For example, analysis of surveillance data allows for:

- Observing trends over time and alerting health staff about emergent events or unusual patterns
- Identifying geographic areas of higher risk
- Characterizing personal variables such as age, gender or occupation that place a person at higher risk for the disease or event.
- Identifying causes of problems and the most appropriate interventions
- Evaluating the quality of public health programs in the LGA over the medium- and long-term.

In general, analyzing routine surveillance data should include the following questions:

- Have any priority diseases or other public health events of concern been detected during the reporting period (this week, for example)? Is an epidemic or unusual public health event suspected?
- Of the cases, deaths or events detected, how many were confirmed?
- Where did they occur?
- How does the observed situation compare to previous observation periods of time this year? For example, when compared to the start of the reporting period, is the problem increasing?
- Are the trends stable, improving or worsening?
- Is the reported surveillance information representative enough of the reporting site's catchment area? Out of all the sites that should report, what proportion has actually reported?
- How timely were the data received from the health facilities?

Each site that collects or receives data should prepare and follow an analysis plan for analyzing routine surveillance information (refer to Annex 3A of this section).

This section describes how to receive surveillance data and analyze it by time, place and person. The analysis may be done electronically or manually. Methods for carrying out the analysis and steps for interpreting and summarizing the findings are also included. Information in this section can be applied to health facility and LGA levels.

3.1 Receive, validate and store data from Health Facilities and other service delivery points

The routine flow of surveillance data is usually from Health facilities and other service delivery points to the next level up to the central level as indicated in the diagram below. At the health facility level, both in-patient and outpatient areas are surveillance sites. The information collected from this site is compiled in standard forms, analysed and then forwarded, to the LGA health management team. LGA merge, aggregate and send their data and reports to provinces, regions or states and subsequently to the federal Ministry of Health.

Refer to Figure 1 (page xxx) on usual flow of surveillance data throughout a health system.

The LGA team receives three types of surveillance data from health facilities in the LGA:

- Immediate/Case-based or other information (line listing) from suspected cases of immediate reportable diseases
- Weekly reporting of epidemic prone diseases
- Monthly summary totals of cases and deaths for the priority diseases

3.1.1 Timeline for reporting

- Reports of suspected cases for immediate reportable diseases should be received by the LGA within 48 hours of the case seen at the health facility.
- Weekly reports from health facilities should reach the LGA by the first working day (Monday) of the following week. The LGAs are to collate same and forward to the State by the second working day (Tuesday) of the following week. Weekly data from the State should be forwarded to the Federal Epidemiology Division by the Third working day (Wednesday) after the reporting week.
- Routine monthly reports of summary data should be received on time.
    - The health facility should report all the totals for the month by the first week after the reporting month.
    - At the LGA, data coming from the various health facilities should be compiled and forwarded to the State by the end of the second week of the succeeding month.

        o   Data from various LGAs should be compiled by the State and forwarded to the Federal Epidemiology Division by the third week of the succeeding month.

> *Note: Make sure that health workers who record, report or store data understand the need for privacy and confidentiality. Please see Annex 17 for guidance in managing public health surveillance data.*

        State Epidemiology unit should send copies of the report to the HMIS unit of the SMOH DPRS

        o   The Federal Epidemiology Division should share their report with the NHMIS division of the FMOH department of health planning research and statistics.

> *Note: **All reports should be complete, regular and timely.** When an outbreak is suspected, cases and deaths should be reported and graphed weekly.*

3.1.2   Check data quality

Make a careful record of all data received at your site. The surveillance team at each level or reporting site where data is received should:

- Acknowledge receipt of the report.
- Log into an appropriate log-book any data set or surveillance report received from any reporting site (Refer to Annex 2E in Section 2).
- Review the data quality.
- Verify whether the form (hard copy or electronic file) is filled out accurately and completely.
- Check to be sure there are no discrepancies on the form.
- Record in the log the date the data was received, what it is about and who is the sender.
- Verify whether the data set arrived timely or was late.
- Merge the data and store them in a database.

> When written reports are received, review case-based reporting forms to see if any essential information is missing. If reports are not being received at all or if they are consistently late, contact or visit the health facility to find out what has caused the problem. Work with the staff at the reporting health facility to help find a solution that could be implemented for improving reporting.

3.1.2   Enter and clean the data

At each level where data is received (health facility, LGA, state or national), the surveillance team should take steps to correctly enter the data into aggregated reporting forms listing data from all the health facilities. Troubleshooting and cleaning data prior to analysis is an important data management practice. Disease trends and maps will not be accurate if information about numbers of cases, time of onset, or geographic location of cases is missing. Use opportunities during supervisory visits to sensitize clinicians about the importance of quality practices for recording in health facilities registers or reporting forms. Emphasize that these registers are sources of data for reporting public health information and may play a role in detecting an unusual event or otherwise undetected public health problem. And therefore should be as in harmonized NHMIS (Refer to Annex 3D)

Data may be recorded and aggregated either manually or electronically if a computer is available. Regardless of the method, use the following practices:

- Update aggregate totals for each week or month that data was received.
- Record a zero when no cases were reported. *If a space, which should have been filled in, is left blank, the next level may have an incorrect picture of the situation. They will not know if data is missing or if no cases were reported.* Zero reporting enables the next level know that surveillance did not detect a case of the particular disease or condition.
- Ensure that weekly totals include only those cases or deaths actually reported for that week. Late reports from previous weeks should be entered with the relevant week and totals updated accordingly.
- Avoid duplicate entries by using the report or case record unique identifier to prevent and check for multiple entries of the same records.
- Establish frequent contacts with the health facilities in order to clarify issues on missing information and address inconsistencies detected in the reporting.

Once the data have been received and entered into the aggregate forms, review them carefully to ensure no mistakes were made during entry. Since surveillance data informs decisions about disease control and prevention, there are important ethical, social and economic consequences if data are not entered and managed correctly or on time.

3.2 Prepare to analyse data by time, place and person

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

- How many cases occurred

- Where the cases occurred
- When the cases occurred
- Who is affected
- Determinants/Risk factors of the disease/events

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

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

The analysis book can be easily observed during a supervisory visit or when the health facility public health team or LGA response team want to have information about how to respond to health events in the area. Sample Tables, Charts and Graphs are shown in Annex 3C.

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

Objectives, tools and methods of descriptive analysis for communicable diseases

Type of analysis	Objective	Tools	Method
Time For immediately notifiable diseases and monthly summary total of cases and deaths for priority diseases	Detect abrupt or long-term changes in disease occurrence, how many occurred, and the period of time from exposure to onset of symptoms.	Record summary total in a **table** or on a **linegraph** or **histogram.**	Compare the number of cases reported in the current period with the number in the previous period (weeks, months, seasons or years)
Place Usually for immediately reportable diseases	Determine where cases are occurring (for example, to identify high risk area or locations of populations at risk for the disease)	Plot cases on a **spot map** of the LGA or area affected during an outbreak.	Plot cases on a map and look for clusters or relationship of the location of the cases to the health event being investigated.

Person	Describe reasons for patterns in disease occurrence, how it occurred, who is at greatest risk for the disease, and determinants/risk factors	Extract specific data about the population affected on a **table.**	Depending on the disease, characterise cases according to the data reported for case-based surveillance such as age, sex, place of work, immunisation status, school attendance, and other known determinants/risk factors for the diseases/events.
Usually for immediately reportable diseases			

3.2.1 Analyse data by time

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

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

Graphs can show how many cases and deaths have occurred in a given time. It is easier to see changes in the number of cases and deaths by using a graph, especially for large numbers of cases or showing cases over a period of time made with bars (a histogram) or lines (a line graph) to measure the number of cases over time.. How to *make a graph* is described in Annex 3B of this section.

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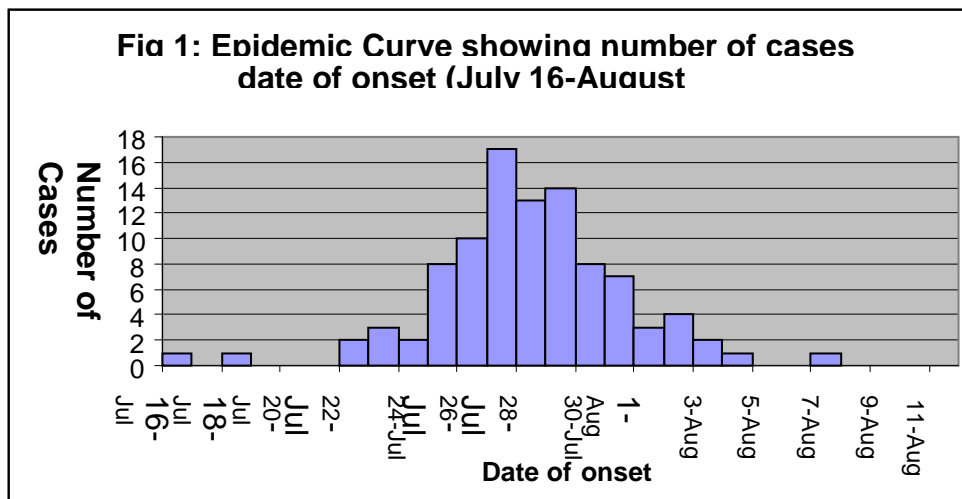
A *histogram* is like a line graph except that it uses squares to represent cases rather than a line to connect plotted points. Use histograms to analyze outbreak data and to show an epidemic curve (an "Epi" curve). For acute outbreak diseases, time may be shown in 1-day, 2-day, 3-day or 1-week or longer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

Using a histogram
Prepare a histogram using data from the case reporting forms and line lists. Plot each case on the histogram according to the date of onset. Use symbols to represent each case. As the histogram develops, it will demonstrate an epidemic curve. Define the geographical area the curve will represent. For example, decide if the curve should describe the entire district or the health facility catchment area where the case occurred.

Highlight significant events on the histogram with arrows. For example, review the log of reported outbreaks to highlight the dates when:

- Onset of the first (or index) case
- The health facility notified the LGA
- The first case was seen at the health facility
- The LGA ct began the case investigation
- A response began
- The LGA notified the higher level

The results of this analysis allow users of this information to look back at the outbreak and answer questions such as when were patients exposed to the illness and the length of the incubation period.

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This is an example of a line graph

3.2.2 Analyse data by place

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

- Identify the physical features of the land
- Understand the population distribution and density of the area
- Describe the population types in an area. (Farming area, high-density urban area, refugee settlement, and so on.)
- Describe environmental factors (major water sources in a community, such as rivers, lakes, pumps, and so on.)
- Identify clinics, meeting houses, schools, community buildings, and large shelters that can be used during emergency situations

Number of cases of diarrhoea with blood by month
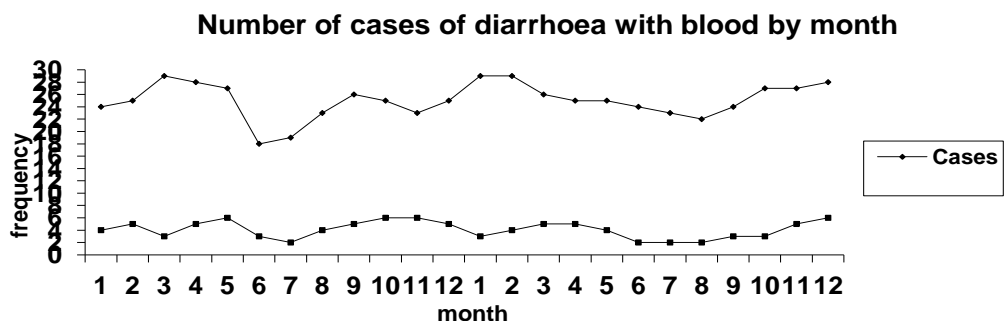
- Show distances between health units and villages (by travel time or distance in kilometres)
- Plan routes for supervisory or case investigation activities
- Spot locations of disease cases and identify populations at highest risk for transmission of specific diseases.

Use manual methods or geographic information software to create a map to use as part of routine analysis of surveillance of disease. On a map of the area where cases occurred, mark the following:

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

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

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

  Create a map to use as part of routine surveillance of disease.
  - Obtain a local map from the local government office or land department. Trace the main features needed for health work on to a transparent paper and then trace on to a large card that can be hung on a wall for easy use. If no official map is available, sketch the whole LGA.

  - Prepare a code of signs to use on the map, to represent each of the following features that will be shown on the map:
    - Location of health facilities in the LGA and the areas each serves
    - Geographic areas such as forests, savannah areas, villages, roads, and cities
    - Socio-economic areas of relevance to priority diseases
    - Significant occupation sites such as mines or construction sites
    - Location of suspected and confirmed cases of priority diseases
    - Location of previous confirmed outbreaks

Figure 5: Spot Map of District X
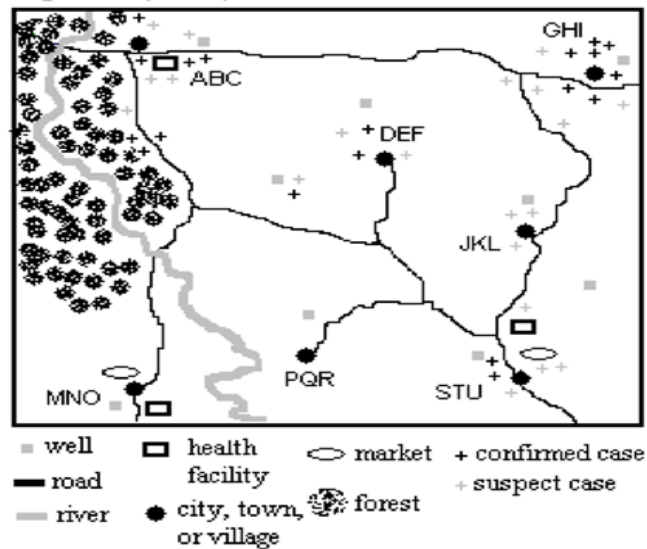
3.2.3 Analyse data by person

Analysis by person is recommended for describing the affected population and those at risk for epidemic-prone diseases and diseases targeted for eradication or elimination. These are diseases that are reported with case-based surveillance forms so that data about personal characteristics is available.

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

Make a distribution of the cases by each of the person variables in the reporting form. For example, compare the total number and proportion of suspected and confirmed cases by :

- Age group
- Sex
- Occupation
- Urban and rural residences
- Vaccination status
- Risk factors
- Outcomes
- Final classification

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Use disease-specific information to decide which variables to compare. For example, if information has been collected about a malaria outbreak, specify the age groupings that are targeted by the National Malaria Program. Compare the age groupings of cases detected in young children (age 2 months up to 59 months) cases in older children (age 5 to 14 years) and cases in adults (age 15 and over).

Analysis by person is usually recommended for describing the population at risk. This analysis is easiest when the data are case-based.

Identifying numerators and denominators

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

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

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

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

Using simple percentages

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

Health facility	Number of Guinea worm cases this year in school age children
A	42
B	30

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

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

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

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

Health facility	Percentage of cases of Guinea worm in school-aged children during last 12 months
A	4%
B	5%

3.2.4   Make a table for person analysis

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

To make a table:

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

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

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

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

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

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

When the summary totals for each age group are entered, one analysis that can be done is to find out what percent of the cases occurred in a given age group. To calculate this percentage:

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

2. Calculate the total number of cases for the time or characteristic being measured. (In this example, there are 78 cases whose age is known.)

3. Divide the total number of cases within each age group by the total number of reported cases. (For example, for children age 0 up through 4 years, divide 40 by 78. The answer is 0.51.)

4. Multiply the answer by 100 to calculate the percent. (Multiply 0.51 X 100. The answer is 51%.)

Age group	Number of reported cases	% of reported cases in each age group
0-4 years	40	51%
5-14 years	9	12%
15 years and older	1	1%
Age unknown	28	36%
Total	78	100%

3.2.6 Calculate a case fatality rate

A case fatality rate helps to:

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

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

To calculate a case fatality rate:

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

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

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

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

Please see the disease specific guidelines in Section 9.0 for recommendations about the essential variables to compare for each disease.

3.3   Draw conclusions from the analysis

Always draw conclusions from the analysis of data.

3.3.1   Review the updated charts, tables, graphs and maps

Review the analysis tools to make sure that:

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

3.3.2   Compare the current situation with previous months, seasons and years

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

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

3.3.3 Determine if thresholds for action have been reached

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

Thresholds are based on information from two different sources:

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

- International recommendations from technical and disease control program experts.

LGAs may decide to observe thresholds for the most critical diseases in their area. It is not useful to have a threshold or trigger occurring for multiple diseases constantly. Health workers will lose their willingness to truly watch for trends and respond to problems if they become overextended.

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

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

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

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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 immunisation activity, community awareness campaign, or improved infection control practices in the health care setting.

Suggested thresholds that alert health workers to a possible outbreak are in the Annex 21 of Section 4. Also refer to the disease-specific guidelines in Section 8.

3.3.4 Summarise the analyzed results

Consider the analysis results with the following factors in mind:

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

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

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

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

3.3.5 Compare index month's achievement towards disease reduction targets

Many public health programs have set disease reduction targets. There may be targets for individual health facilities, for communities and for the LGA as a whole.

> *Harmonize data with the managers of the public health activity programs and discuss progress towards the targets based on the analysed results.*

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

- Improve drug availability for Pneumonia case management in children under 5 years of age
- Improve drug availability at least for pregnant women and children during the Malaria season
- Work with community health workers to improve community awareness about when to bring children to the health facility for treatment for Diarrhoea with dehydration, Pneumonia, and Malaria.
- Expand HIV/AIDS prevention education to reach youth not in school.
- Improve immunisation coverage in areas of highest risk for a given vaccine-preventable disease (Measles, Meningitis, Neonatal and Maternal Tetanus, Yellow fever)

3.4 Summarise and use the analysed results to improve public health action

Prepare and share with all stakeholders who need this information, a concise action oriented summary of the surveillance findings. Use simple tables, graphs and maps, with clear and short description, interpretation, comments and recommendations.

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

- Conduct an investigation to find out where there is an increase in the number of cases.
- Collaborate with specific disease reduction programs to intensify surveillance if an alert threshold has been crossed,

- Advocate with political leaders and the community for more resources, if lack of resources is identified as a cause for the increased number of cases.
  How to investigate public health problems is in Section 4.0.

Information sharing is an important surveillance function and a powerful mechanism of coordination. It motivates the staff who send reports and builds partnership through the transparency that information sharing displays. Thus it is important to share analyzed results and provide feedback on time. Please refer to Section 7 of these guidelines for information and examples about communication and sharing feedback.

3.5. *Advanced Analysis of Surveillance Data at State and National level*

An advanced analysis of surveillance data should be conducted at the state and national level. This exercise should be carried out during and after outbreak investigation.

3.5.1.1 Purpose of analytical studies in Disease Surveillance and Response

Analytical studies can help in identifying the risk factors associated with the transmission of a disease and determinants of diseases. In a situation where an outbreak of a public health event of an unknown cause occurs, an analytical study can support the identification of the cause of the event. Analytical study can answer the following type of questions:
- What is the source of infection for an outbreak of diarrhoeal disease?
- What are the risk factors for neonatal tetanus?
- What factors are associated with increased mortality for persons with measles?

3.5.2 Types of analytical studies and Steps

Two types of analytical studies can be used in disease outbreak investigation and response:
A. Case Control studies
B. Cohort studies

Steps in conducting case control study:

1. Start with counting the cases
2. Determine a possible determinants/risk factor for the outbreak
3. Are the observed exposures higher than expected?
4. Identify individuals (controls), from the community, with the same determinants/risk factor but do not have the disease
5. Plot a 2×2 table
6. Conduct statistical test
7. Determine the role of the determinants/risk factor in the transmission of the disease
8. Carry-out an intervention to prevent future occurrence

Example:

- If an outbreak of diarrhoea with blood (dysentery) 100 cases were reported
- You find that among the cases in the line list, many (80) had eaten a particular vegetable soup (determinants/risk factor) one day before illness
- All cases in the line list are students from school "A" (total of 200 students)
- Vegetable soup was provided at the school canteen
- The only way to measure the association is by comparingthe exposure among cases to non-cases

Even though the information above indicates that most of the cases have eaten vegetable soup, a conclusion cannot be reached that thedeterminants/ risk factor for the dysentery is vegetable soup.

The epidemic rapid response team will need to identify 100 students in the school that do not have dysentery and ask about the determinants/risk factor (ate vegetable soup). The information obtained will be used to complete the table below.

Exposure	Ill (Case)	Not ill (control)	Total
Ate vegetable soup	80 (a)	30 (b)	110
Did not eat vegetable soup	20 (c)	70 (d)	90
Total	100	100	200

Is vegetable soup the cause of this outbreak?
- 80% of sick children ate vegetable soup, compared to 30% of healthy children
- Appears likely that vegetable was the cause of the outbreak (BUT beware of confounding!)
- Need to assess other potential determinants/risk factors as well and adjust for them
- Then Estimate risk – Odd Ratio (OR) which is the ratio of the odds of exposure to a factor in those that have a condition compared to those without the condition.
- OR = Odds of having ate vegetable amongst those that had dysentery =
  a/c

  Odds of having ate vegetable amongst those that did not have dysentery
  b/d

$$OR = \frac{a \times d}{c \times b} \qquad \frac{80 \times 70}{20 \times 30} = 9.3$$

- If Odd Ratio is > 1, then vegetable soup is most likely the risk factor.

Annexes to Section 3

- ANNEX 3A: How to make a plan for routine analysis of surveillance information

- ANNEX 3B: How to manually make a line graph

- ANNEX 3C: Sample tables, charts and graphs
- ANNEX 3D: Health Facility Daily OPD register (harmonized NHMIS version 2013)

ANNEX 3A   How to make a plan for routine analysis of surveillance information

A minimum plan for routine analysis of surveillance information should include the following tables, graphs and maps.

1. Calculate completeness and timeliness of reporting

   Monitoring whether surveillance reports are received on time and if all health facilities have reported is an essential first step in the routine analysis of the surveillance system. This assists the LGA (or other level) surveillance team in identifying silent areas (areas where health events may be occurring but which are not being reported) or health facilities that need assistance in transmitting their reports.

2. Calculate LGA (or other level) totals by week (or by month). Update the total number of reported cases and deaths for the whole year. This is summary information that helps to describe what has happened in the particular reporting period.

3. Prepare cumulative totals of cases, deaths and case fatality rates since the beginning of the reporting period.

4. Use geographic variables (such as hospitals, residence, reporting site, neighborhoods, village and so on) to analyze the distribution of cases by geographic location. This is information that will help to identify high risk areas.

5. Analyze disease trends for at least the diseases of highest priority in your LGA. Monitor the trends for cases, deaths, and case fatality rates to identify any unusual increases or disease patterns.

An example of a product from an analysis plan for routine surveillance information is on the next page.

Example of analysis plan for cholera in Country A, 2010

Distribution by Time

Onset week	Outcome		Total	Case fatality rate
	Deaths	Alive		
26	7	16	**23**	30
27	5	92	**97**	5
28	1	87	**88**	1
29	2	19	**21**	10
32	0	11	**11**	0
33	2	9	**11**	18
Total	17	234	**251**	7

Distribution by Place

District	Outcome		Total	Case fatality rate
	Deaths	Alive		
LGA 1	0	1	**1**	0
LGA 2	6	86	**92**	7
LGA 3	11	147	**158**	7
Total	17	234	**251**	7

District	Population	Cases	Attack rate per 100,000
LGA 1	179888	92	**51**
LGA 2	78524	158	**201**

Distribution by Person

Age Group	Outcome		Total	Case fatality rate
	Deaths	Alive		
00-4 years	2	35	**37**	5
05-9 years	5	50	**55**	9
10-14 years	2	28	**30**	7
15-19 years	0	23	**23**	0
20-24 years	1	27	**28**	4
25-29 years	2	24	**26**	8
30-34 years	1	11	**12**	8
35-39 years	2	6	**8**	25
40 + years	2	30	**32**	6
Total	17	234	**251**	7

Sex	Outcome		Total	Case fatality rate
	Deaths	Alive		
F	8	114	**122**	7
M	9	120	**129**	7
Total	17	234	**251**	7

	How to make a line graph
1.	Decide what information you want to show on the graph.
2.	Write a title that describes what the graph will contain (for example, *Monthly totals for inpatient cases and deaths due to malaria with severe anaemia*).
3.	Decide on the range of numbers to show on the vertical axis. • Start with 0 as the lowest number • Write numbers, going up until you reach a number higher than the number of cases • Chose an interval if the numbers you will show on the vertical axis are large.
4.	Label the vertical axis, explaining what the numbers represent.
5.	Label the horizontal axis and mark the time units on it. The horizontal axis is divided into equal units of time. Usually you will begin with the beginning of an outbreak, or the beginning of a calendar period, such as a week, month or year.
6.	Make each bar on the graph the same width.
7.	Mark the number of cases on the graph or histogram. For each unit of time on the horizontal axis, find the number of cases on the vertical axis. Fill in one square for each case, or for some number of cases in the column for the day on which the patient was seen. Show deaths by using a different pattern of lines, or a different color. If you are making a line graph, instead of making a bar or filled-in squares, draw a cross or make a point where the horizontal and vertical lines cross. Connect the points on the graph to show the trend going up or down over time.

Annex 3C: Sample tables, charts and graphs

Weekly

cases																														
deaths																														

Sample tables for person analysis

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

Age distribution

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

Location: Urban versus rural

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

Gender distribution

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

Comparing Inpatient and Outpatient Status

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

Comparing immunisation status and outcome

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

Trends of Cerebro Spinal Meningitis Cases in 2010, weeks 1-9 in a West African Country. <u>Source</u>: Ministry of Health, 8 March 2010 update
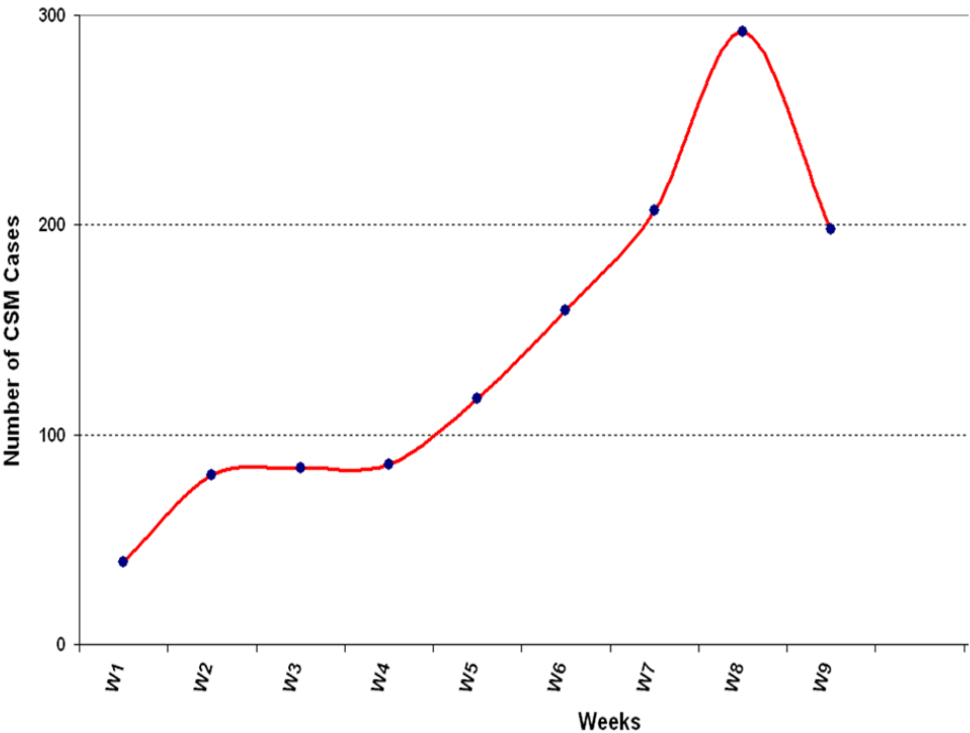
ANNEX 3D: Health Facility Daily OPD register (harmonized NHMIS version 2013)

NATIONAL HEALTH MANAGEMENT INFORMATION SYSTEM
DAILY OUT PATIENT REGISTER (VERSION 2013)

NHMIS/HF/OPD

1. State_____   2. LGA:_____   3. Ward _____

4. HEALTH FACILITY _____   5 MONTH/YEAR _____

Column headers (left section):
- 6. S/N
- 7. Date
- 8. Name of patient
- 9. Patient number
- 10. Sex (F/M)
- 11. Age
- 12. Type of attendance (New / Follow up)
- 13. Presenting complaint
- 14. Diagnosis
- 15. Type of laboratory investigation done
- 16. Drugs given
- 17. **Outcome of visits (NT, T, A, RO — Please write condition that required referral, D)
- 18. Clinical Diagnosis code only (Tick if one has heart was done in other conditions)
- 19. Laboratory Diagnosis (RDT, Microscopy Qualitative) — Malaria (<5 yrs, ≥5 yrs, PW)
- 20. Complement Uncomplicated Malaria (only if TESTED positive for Malaria)
- 21. Severe Malaria (only if TESTED positive for Malaria)
- 22. Tick if ACT is given
- 23. Tick if other antimalaria is given

Column headers (right section):
- HIV counseling and testing — Male: 24. HIV counsel, test & result; 25. HIV test result: positive
- Female Non-pregnant: 26. HIV counsel, test & result; 27. HIV test result: positive
- 28. Couple Counselling & Testing
- 29. Couple Sero-discordant Test
- HIV clinical care & treatment: 30. HIV positive and receiving CTX; 31. Receiving ARV refill
- SRH/HIV Integration: 32. HCT clients provided with SRH/HIV integrated Services; 33. HCT client referred for FP method (Male, Female); 34. HCT clients screened for STIs (Male, Female); 35. HCT clients treated for STIs (Male, Female)
- TB/HIV: 36. Clinically screened for TB; 37. TB clinical screening score (Exit as risk or =1); 38. HIV positive recieving ART and TB treatment

TOTAL

*Enter months for children under 5 yrs. and years for others
**NT - not treated   T - treated   A - admitted   RO - referral out   D - dead
PW - Pregnant Woman
ACT = Artemisin Combination Therapy
AA = Artemisinin Amodiaquine combination
AL = Artemisinin Lumefantrin combination
RDT = Rapid Diagnostic Test

CTX = Cotrimoxazole   SRH = Sexual & Reproductive Health

36. Name of reporting officer: _____   37. Designation: _____
38. Signature: _____   39. Date: _____

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Section 4: Investigate reported outbreaks and other public health events

This section describes how to:

- Decide to investigate a reported outbreak or other public health event
- Record outbreaks, public health events and rumours
- Verify reported information
- Prepare to conduct an investigation
- Confirm the outbreak or event
- Conduct an immediate response
- Analyze the investigation results to determine what caused the Public health event or risk

4.0   Investigate and confirm suspected outbreaks and other public health events

The results of an investigation of an outbreak or other public health event lead to identification and assessment of people who have been exposed to an infectious disease or affected by an unusual health event. The investigation provides relevant information to use for taking immediate action and improving longer-term disease prevention activities. The steps for conducting an investigation of a suspected outbreak due to an infectious disease can also be used to investigate other public health problems in the LGA such as when an increase in chronic or non-communicable disease is detected.

The purpose of an investigation is to:

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

In Nigeria, LGAs have the primary responsibility for investigating outbreaks while other levels support them. Health facilities (at least large health facilities with adequate numbers of staff and a public health officer or team) undertake some or all aspects of investigating outbreaks for some diseases or public health events.

4.1   Decide to investigate a reported outbreak, or public health event

The responsibility for investigating outbreaks depends on national policy, resources, and local policy. In most countries, LGAs have the overall responsibility for investigating outbreaks. These guidelines assume that the LGA level has responsibility for leading the investigation, and the guidelines also apply to health facilities and States.

For some communicable diseases, a single suspected case is the trigger for taking action, reporting the case to a higher level, and conducting an investigation. This is because these are dangerous diseases with either the potential for rapid transmission or high case fatality rates if cases are not treated promptly.

For other diseases, the trigger is when cases reach a defined threshold (a particular number of cases per 100,000 population, for example). Health staff should promptly investigate the problem and respond to the cases immediately. Preparations for taking a wider public health response should be made. Alert and epidemic thresholds are described in Section 3.3.

NOTE: The threshold for some diseases will not change between LGAs or health facilities because the thresholds trigger immediate notification, and are set by national policy.

*However, some urgent health events require investigations to be carried out immediately. Thus, **LGAs should aim at investigating suspected outbreaks and events within 48 hours of notification.***

Conduct an investigation when:

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

Alert and epidemic thresholds of epidemic prone diseases.

S/N	Disease	Alert Threshold	Epidemic Threshold
1.	CSM	5 cases per 100,000 inhabitants per week in a pop. greater than 30,000. 2 cases per 100,000 inhabitants per week in a population of 30,000 or less.	10 cases per 100,000 inhabitants per week in a pop. greater than 30,000. 4 cases per 100,000 inhabitants per week in a population of 30,000 or less.
2.	Yellow Fever	If a single case is suspected.	If a single case is confirmed.
3.	Measles	5 or more suspected cases reported from a LGA/health facility in a month.	3 or more measles IgM+ confirmed cases in a LGA/health facility in a month.
4	Viral Haemorrhagic Fever (Lassa Fever)	If a single case is suspected.	If a single case is confirmed.
5	Cholera		Doubling of cases per week.
6	Influenza A/H1N1	If a single case is suspected.	If a single case is confirmed.
7	Anthrax	If a single case is suspected.	If a single case is confirmed.
8	Small pox	If a single case is suspected.	If a single case is confirmed.

4.1.1 Establish Health Facility Threshold for Other Diseases.

For epidemic-prone diseases, there are nationally established thresholds. However, for other diseases, health facilities may establish thresholds using the following steps:

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

2. As appropriate, take into account factors like seasonality for diseases such as Malaria.

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

4. Periodically, revise the epidemic threshold and adjust it accordingly depending on past and current trends for the disease. If the extent of the disease's burden is changing (for example, cases are increasing), then adjust the threshold.

   Thresholds or triggers for taking action to implement interventions or investigations of a case or outbreak are in Section 9 of these guidelines.
   These thresholds are recommended by FMoH/WHO to meet the national policies, priorities and capacity to respond.

4.2 *Record reported outbreaks, public health events and rumours*

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

A sample form for tracking reports of outbreaks is in Annex 4A of this section. If the LGA is using a LGA analysis workbook for recording and analyzing long term trends, include the tracking form in the workbook.

4.3   *Verify the reported information*

Investigating outbreaks requires human, logistic and financial resources. When a suspected outbreak or event is reported, promptly verify that the information is accurate and reflects conditions suggesting a true outbreak or event. This will help to ensure that resources are used effectively.

To verify the information, consider the following factors:

- Source of information (for example, is the source of the rumour reliable? Is the report from a health facility?)
- Severity of the reported illness and use of standard case definition for reporting
- Number of reported cases and deaths
- The age and gender of reported cases or deaths
- Transmission mode of suspected pathogen and risk for wider transmission
- Political or geographic considerations
- Importance of maintaining good partner and community relations
- Available resources.

After taking the above factors into consideration, the situation may require a more urgent response than anticipated. For example, reports of a suspected viral hemorrhagic fever case are treated with more urgency than reports of a less virulent disease because of the potential for high rates of death and rapid transmission.

> ***Regardless of the factors, all suspected outbreaks or events (including immediate reportable diseases or events) reported from health facilities need to be reported to the next level within 48 hours.***

4.4   Prepare to conduct an investigation

Co-ordinate the investigation objectives with the person in the LGA responsible for control of that disease or condition. Make sure that the objectives of the investigation will provide the essential information for implementing the most appropriate and relevant response. Plan to use appropriate methods that are relevant to the disease or condition being investigated. If epidemic

response and preparedness activities have taken place in the LGA or health facility, staff who may be able to take part in the investigation should already be identified and trained.

Note: periodically review and update the immunization status of personnel who take part in infectious diseases outbreak investigation and response activities.

4.4.1 Specify role of health workers

Inform health workers about the tasks they are expected to do during the investigation and the functions they are supporting. Contribute to the positive motivation for doing the investigation. For example, make sure that the investigation team understands the link between the investigation results and the selection of response activities for preventing additional cases and saving lives. Ensure that health staff has access to and know how to use required personal protection equipment and universal precautions relevant for the possible cause of the suspected outbreak or event.

4.4.2 Define supervision and communication lines

Make a communication plan. Prepare a diagram showing who will report to whom and how information will move both within the investigation team and between the LGA and other levels, including the community level. For example, define who will communicate with the community, LGA, SMOH, FMoH and the media. State the methods for communicating and how often it should be done during an outbreak to keep officials informed. Methods may include daily updates by telephone/SMS, radiophone, fax, electronic mail or conference calls and other local means.

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

It is essential to have in place a procedure for communication with the community and key partners. This is important for ensuring the sharing of critical information about identifying and responding to risks associated with the outbreak or event.

4.4.3   Decide where the investigation will take place

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

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

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

4.4.4   Obtain the required authorizations

Observe and obtain the appropriate authorizations, clearances, ethical norms, and permissions that are required to do the investigation. In addition to official authorizations, make sure you inform and involve the local persons of influence in the community.

4.4.5   Decide on the forms and methods for collecting information and specimens

Select those variables needed to identify, record, and analyze the disease being investigated (A selection of case investigation forms with key variables noted are in the annexes 4B & C to this section). Depending on staff responsibilities, review how to:

- Record case information on a line list for later use in summarizing variables for use in time, place and person analysis
- Prepare (and update as needed) an epidemic curve
- Construct a spot map showing location of geographic variables such as location of cases and deaths
- Develop analysis tables for risk factors, age group, sex, immunization status and so on.

4.4.6 Arrange for transportation and other logistics

Make travel arrangements for getting to and from the site of the investigation and for travelling during the investigation. Make sure transportation for moving specimens to the appropriate laboratories has been arranged in advance of the team's departure.

4.4.7 Gather supplies for collecting laboratory specimens

Some LGAs may already have in place a rapid response kit that contains supplies and equipment for carrying out an investigation (including laboratory supplies).

If a kit is not available in your LGA, look at the disease specific program guidelines (see Section 9) and talk to laboratory specialists to find out the requirements for laboratory supplies for proper collection, storage, and transport of relevant specimens (refer to Annex 4D).

> *Use of personal protective equipment (PPE) and disinfection materials is strongly recommended (refer to Annex 4E).*

4.5 Confirm the outbreak or event

4.5.1 Review the clinical history and epidemiology

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

- Where do you live?
- When did the symptoms begin?
- Who else is sick in your home, school, workplace, village, neighbourhood?
- Where have you travelled to recently?
- Where have you been living during the past 3 weeks prior to the onset of symptoms (residence at time of infection)?
- Were you visited by anyone within the last 2 weeks?
- Have you been in contact with sick or dead poultry or birds or animals recently (for zoonosis)?

- What vaccines have you received recently (for AEFIs)?

4.5.2 Collect laboratory specimens and obtain laboratory results to confirm the diagnosis

If the disease can be confirmed by laboratory testing, refer to the laboratory requirements in Section 9.0 to determine the diagnostic test and the specimen that is required. The disease specific laboratory requirements also describe how to collect, store and transport the relevant specimen, and how many specimens to collect to confirm an outbreak for that particular disease.

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

4.6 Carry out an immediate response

4.6.1 Isolate and treat cases as necessary

As indicated by the case management guidelines for LGA RRT, strengthen infection control (including isolation of patients if indicated) and case management where the patients are being treated. Provide the health facility with advice, support, and supplies.

Use standard precaution with all patients in the health facility, especially during an outbreak of a disease transmitted by contact with contaminated supplies and body fluids.

4.6.2 Search for additional cases

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

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

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

See Annex 4F at the end of this section for instructions on conducting a register review. Make sure to follow up any cases that have been allowed to go home.

4.6.2.2   Search for contact persons and suspected deaths in the community

Identify areas of likely risk where the patients have lived, worked, or travelled such as a zoo, poultry farm, laboratory, or hunting sites. Also talk to other informants in the community such as pharmacists, school teachers, veterinarians (to know about the animal health situation), farmers, and community leaders.

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

Refer newly identified cases to the health facility for treatment. See Annexes 4G and 4H of this section for examples of forms for recording and following-up on contacts for additional cases.

4.7 Record information about the additional cases

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

4.7.1 Record information on a case reporting form

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

- The patient's name, address, and village or neighbourhood and locating information. If a specific address is not available, record information that can be used to contact patients if additional information is needed or to notify the patient about laboratory and investigation results
- The patient's age and sex. This information is used to describe the characteristics of the population affected by the disease
- The date of onset of symptoms and date the patient was first seen at the health facility
- Relevant risk factor information such as immunization status if the disease being investigated is a vaccine-preventable disease
- The name and designation of the person reporting the information.

Some diseases have their own more detailed case investigation form. Detailed forms outlining particular information for investigating specific diseases are in the Annexes at the end of Section 9.

4.7.2 Record information about additional cases on a line list

When five (5) to ten (10) cases have been identified, and the required number of laboratory specimens has been collected, record any additional cases on a line list (Additional specimens may be collected as need be). Use the line list as a laboratory transmittal form if 10 or more cases need laboratory specimens collected on the same day and specimens will be transported off to the lab in a batch.

4.8   Analyse outbreak data

The methods for analysing outbreak data are similar to how the analysis of summary data is described in Section 3. Data about the outbreak is analysed and re-analysed many times during the course of an outbreak.

During the initial analysis, summarise the outbreak and look for clues about the place of occurrence, its mode of spread and the source of the outbreak (from a single source, for example, a well or a funeral). Also look for clues about the persons at risk of becoming ill (for example, young children, refugees, persons living in rural areas and so on). Present the data in the following way:

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

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

4.8.1   Analyse data by time

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

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

The results of the time analysis allows program managers and surveillance officers to look back at the outbreak and answer questions such as when were patients exposed to the illness and the length of the incubation period.

Highlight significant events on the histogram with arrows. For example, review the log of reported outbreaks and rumours to highlight the dates when:

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- The first (index) case occurred /was detected
- The health facility notified the LGA
- The first case was seen at the health facility
- The LGA began the case investigation
- A concrete response began
- The LGA notified the SMoH and the FMoH

Note: The purpose for highlighting these events with arrows is to evaluate whether detection, investigation and response to the outbreak was timely. For example, monitoring the interval between the onset of the first known case and when the first case was seen in the health facility is an indicator of the community's awareness of the disease's signs and symptoms and the need to refer cases to the health facility. These intervals are discussed further in Section 7.0

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

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

4.8.2 Analyse data by place

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

- Clusters of cases occurring in a particular area
- Travel patterns that relate to the mode of transmission for this disease
- Common sources of infection for these cases.

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

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

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

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

4.8.3 Analyse data by person

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

- Age or date of birth
- Sex
- Urban and rural residences
- Immunisation status
- Inpatient and outpatient status
- Determinants/Risk factors
- Outcome of the episode, for example, whether the patient survived, died or the status is not known.
- Laboratory results
- Final classification of the case
- Other variables relevant to this disease (death by age group, for example).

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

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

4.9   Interpret analyzed results

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

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

4.9.1   Interpret analyzed result by time

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

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

4.9.2   Interpret analyzed result by place

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

4.9.3   Interpret analyzed result by person

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

Interpret Case Fatality Rate (CFR)
For disease specific CFR interpretation, check Section 9 for details.

4.10   Conduct a risk assessment and identify the determinants to explain the outbreak or the event

Risk assessment should be initiated as soon as possible by the designated investigation team to address the following questions:
- Is the public health impact of the event serious?
- Is the event unusual or unexpected?
- Is there a significant risk of international spread
- Is there a significant risk of international travel or trade restrictions?

The national level may be called upon to participate in the risk assessment at the end of which the decision will be made on whether the event is potential PHEIC hence warranting its notification (refer to decision instrument in Section 2)

4.11   Conclude and make recommendations

After reviewing the analysis results, conclude and make recommendations about the outbreak:

- Confirmation of the outbreak/public health event (is this situation an outbreak/public health event?)
- Population affected and at risk
- Possible causes of the outbreak/ public health problem, laboratory results, source of infection, mode of transmission, attack rate, case fatality rate and possible risk factors.

- Measures already initiated to contain the outbreak.
- Recommendations:
  - For controlling the situation
  - Further investigation/studies

4.12   Report the outbreak investigation

The LGA rapid investigation team should immediately prepare an outbreak investigation report. This detailed report of the outbreak investigation should be prepared and disseminated immediately to all concerned including the health facility where the outbreak occurred.

A suggested outline for writing an investigation report is described in Annex 7A of Section 7.

Annexes to Section 4

- ANNEX 4A LGA Log of suspected outbreaks and rumours

- ANNEX 4B Neonatal tetanus case investigation form

- ANNEX 4C AFP case investigation form

- ANNEX 4D Checklist of laboratory supplies for use in an outbreak investigation

- ANNEX 4E Recommended list of personal protective equipment

- ANNEX 4F How to conduct a register review

- ANNEX 4G Contacts recording sheet

- ANNEX 4H Contact tracing form (follow-up)

ANNEX 4A: LGA log of Suspected Outbreaks and Rumours

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

TO BE COMPLETED IN TRIPLICATE

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE (IDSR): LGA LOG OF SUSPECTED OUTBREAKS AND RUMOURS

Condition or Disease	Date LGA was notified	Name of informant	Location of **informant** (Village, community, HF, etc)	Name(s) of suspected case(s)	Age of suspected case	Sex of suspected case	Location of **case(s)** (Village, community, health facility, etc)	Date a case was first seen at a health facility	Date or Period suspected outbreak / rumour was investigated by the LGA	Result of LGA investigation (Confirmed, Ruled Out or Unknown)	Date Outbreak Began (Date onset index case / date crossed threshold or first cluster)	Date concrete **intervention** began	Type of Concrete intervention that was begun	Date LGA notified State / National Level of the Outbreak	Date LGA received State / National response	Comments / Recommendations

Name(s) of investigator(s): _____

_____

_____

_____

Signature(s) of investigator(s): _____

_____

_____

_____

_____
_____
_____

Date: ____

ANNEX 4B

CASE INVESTIGATION FORM – NEONATAL TETANUS

EPID Number _____ _____ _____ _____   Date received at Zonal/national level ____ ____ ____

IDENTIFICATION
LGA _____   State _____

Nearest health facility to village _____   Neighborhood _____ ____Town/City _____

Address _____ _____

Name(s) of Patient _____   Mother _____

Sex   1. Male   2. Female   Father _____

NOTIFICATION / INVESTIGATION
Notified by_____ _____   Date case Notified ____ / ____ /____   Date Case investigated: ____ /____/ ___

MOTHER'S VACCINATION HISTORY

Mother vaccinated with TT? 1.Yes 2.No 9.Unknown   Number of doses _____   lst ___/___/ ___ 4th ___ / ___ / ___
                                                                                          2nd___ ___ ___ 5th ___ ___ ___
Have card? 1.Yes 2.No 9.Unknown   Vaccination status of mother prior to delivery 1. Up to Date   3rd___ ___ ___ If >5 last dose ___/___/____
                                                                      2. Not up to date
                                                                      9. Unknown

BIRTH OF INFANT
Date of Birth __ __ __   Location of birth 1. Hospital   4. Home untrained attendant   Cut cord with a sterile blade?   Cord treated with anything
                                                2. Health Centre   5. Home, no attendant   1. Yes   1. Yes
                                                3. Home trained attendant   9. Unknown   2. No   2. No
                                                                                                          9. Unknown   9. Unknown

Describe treatment of cord_____

Mother received antenatal care 1. Yes   Where? _____   If birth in institution, name of institution
                               2. No
                               9. Unknown
How many prenatal visits? _____   Attended by doctor / nurse? 1. Yes   2. No 9. Unknown   Attended by a trained TBA/Midwife?
                                                                                                  1. Yes (Give name)_____
                                                                                                  2. No   9. Unknown

INITIAL CLINICAL HISTORY

Date onset of symptoms ___ ___ ___   Was baby normal at birth? 1. Yes 2.No 9.Unknown   Arched back:1.Yes   2. No   9. Unknown
                                          Normal cry and suck during first 2 days? 1. Yes 2. No. 9. Unknown
                                          Stopped sucking after 2 days? 1. Yes 2. No 9. Unknown
Age of onset in days _____(99=unknown) Stiffness? 1.Yes 2.No 9.Unknown   Complications? 1. Yes 2. No 9. Unknown

Age at death in days _____   Spasms or Convulsions? 1.Yes 2. No 9.Unknown   Baby died? 1.Yes 2.No 9. Unknown

TREATMENT
Seen in OPD? 1.Yes 2.No 9.Unknown   Admitted? 1.Yes 2.No 9.Unknown   Date of admission ___ ___ ___

                                            Medical number _____   Facility Address_____

                                                                                           _____

COMMENTS_____

RESPONSE

Mother given protective dose of TT within 3 months of report?   1. Yes   2.No   9. Unknown   Date of response for supplemental ____/ ___ _/___

                                                                                              Details of response: _____
Supplemental immunization within same locality as the case?   1. Yes   2.No 9.Unknown   _____

FINAL CLASSIFICATION OF THE CASE: **Neonatal Tetanus**   1.Yes 2.No 9. Unknown

Investigator : Name _____ Title_____ Unit _____
Address _____ Date: _____/_____/_____ Phone: _____

ANNEX 4C

CASE INVESTIGATION FORM - ACUTE FLACCID PARALYSIS

AFP-CI01

Federal Ministry of Health, Nigeria

Official Use Only   Epid number: _____ _____ _____ _____ _____   Received_____

| Ctry | State | LGA | Year onset | Case no. |

IDENTIFICATION

LGA:_____   State:_____   **Nearest Health Facility to Village:** _____

Address:_____   Village/Neighborhood:_____   Town/City: _____

Name(s) of patient:_____   Father/Mother:_____

Date of Birth:_____/_____/_____   Age:Years_____   Months_____   Sex: [ ] M=Male [ ] F=Female
       aa   mm   yy

NOTIFICATION/INVESTIGATION

Notified by:_____   Date Notified:_____   Date Case Investigated: ____/____/_____

HOSPITALIZATION

Admitted to hospital [ ] 1=Y 2=N   Date of Admission:___/___/___

Medical Record No._____   Name/address of facility:_____

CLINICAL HISTORY

Date Onset of Paralysis:____/_____/_____

Fever at onset of paralysis [ ]   Paralysis progressed 0-3days [ ]

Flaccid & sudden paralysis [ ] 1=Y, 2=N   Asymmetrical [ ] 1=Y, 2=N   **Site of Paralysis**

| LA | RA |
| LL | RL |
Y,N

AFTER INVESTIGATION, WAS THIS A TRUE AFP? [ ]

1=Yes If 'No', then the rest of the form does not need to be completed
2=No Mark '6' for final Classification

VACCINATION HISTORY:

Total polio doses [ ] Exclude birth dose   **99-unknown**

OPV Doses   Birth___/____/_____   2nd___/____/_____   4th___/____/_____
               1st___/____/_____   3rd___/____/_____   if>4,last OPV dose __/__/__

STOOL SPECIMEN COLLECTION

Date 1st stool:____/____/_____   Date 2nd Stool:____/____/_____   Date Stool Specimen sent to National Lab: ____/____/_____

STOOL SPEECIMEN RESULTS

____/____/_____ [ ]   ___/___/_____   ___/___/_____   **Primary isolation result:**

Date specimen received by National Lab   Condition of Stool   Date result sent by lab to State   Date result received by State

P1	P2	P3	NP-Ent
[ ]	[ ]	[ ]	[ ]
1=Y, 2=N	1=Y, 2=N	1=Y, 2=N	1=Y, 2=N

____/____/_____   ____/____/_____   ____/___/_____

Date isolate sent from National lab to Regional Lab   Date differentiation result sent by Regional Lab   Date differentiation result received by State

W1 W2 W3   V1 V2 V3   NP Ent
[ ][ ][ ]   [ ][ ][ ]   [ ]
1=Y. 2=N

FOLLOW-UP EXAMINATION

Residual Paralysis?

Date follow-up examination:____/_____/_____

| LA | RA |
| LL | RL |
Y,N

Findings at Follow up: [ ]

1=Residual Paralysis
2=No residual paralysis
3=Lost to follow-up
4=Death before follow-up

FINAL CLASSIFICATION OF THE CASE: [ ]

1=Confirmed   3=Discarded
2=Compatible   6=Not an AFP

INVESTIGATOR

Name:_____   Title:_____

Unit:_____   Address:_____   Phone:_____

Where has the child been seeking help for this problem before presenting here (in sequence of visit)?
(1)Place: _____   Duration:_____   (2)Place:_____ Duration:____

Copy 1, White: Send immediately to the Data Manager in Abuja after completion

Copy 2, Pink: Send along with stool specimen to the National Laboratory

Copy 3, Green: Send to the Data Manager in Abuja after completing the sixty days follow up examination, Laboratory result and any additional information

Copy 4, Blue: Remains in the Surveillance Officer's File at State level

Copy 5, Yellow: Remains in the DSNO's file at L.G.A. level.

O

f contaminated supplies and equipment

ANNEX 4D: Checklist of laboratory supplies for use in an outbreak investigation

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

_____ Pieces of bar soap (or liquid soap) and bleach for setting up hand-washing stations
_____ Supply of gloves (size 71/2 to 8)
_____ 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
_____ Tourniquet
_____ Transport tubes with screw-on tops
_____ Transport media - Cary-Blair, Trans-Isolate

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

Blood films (malaria)
_____ Sterile or disposable lancet
_____ Glass slides and cover slips
_____ Slide box

Stool
_____ Rectal swabs
_____ Cary-Blair transport media

• If health facility has a centrifuge:

_____ Sterile pipette and bulb
_____ Sterile glass or plastic tube, or
_____ Screw cap bottles

• For packaging and transporting samples:

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

ANNEX 4E: Recommended list of personal protective equipment (PPE)

The following equipment should be available for the personal protection of all staff investigating a suspected case of any viral haemorrhagic fever or avian influenza. The equipment should be held at State 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	

ANNEX 4F: How to conduct a register review

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

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

- Any inpatient facility with more than 10 hospital beds. Give priority to government health facilities.

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

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

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

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

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

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

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

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

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

- -- The patient's name and address
- -- The signs and symptoms
- -- Date of onset of symptoms and outcome (for example, date of death, if relevant)
- -- Immunisation status, if appropriate to this disease

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

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

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

6.   *Line list the suspected cases that are found*.

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

investigation activities.

7.   *Provide feedback to the health facility staff*.

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

8.   *Report any suspected cases to the next level*.

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

ANNEX 4G: *Contacts recording sheet*

Contact's[1] Recording Sheet   filled in by ……………………………………………….
Case name …………..…………………….. Case number (if assigned) …………………………….….
Case's Village/neighborhood …………………. Chief or Community leader…………….……………………….…
LGA/Town ……………………………….. State…………………………….………………………
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	LGA/Town	Type of Contact (1, 2 or 3, list all)	Date of last contact	Last date for follow-up	1st Visit	Out come

[1] Contacts are defined 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 animal

ANNEX 4H: Contact tracing form (follow-up)

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

Village ……………………………..… Chief or Community leader….…………………………..…
LGA/Town …………………………..…..   State ……………….…………

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

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

Section 5: Prepare to respond to outbreaks and other public health events

This section describes how to:
- Establish/strengthen a LGA public health management committee
- Establish /strengthen LGA rapid response team
- Prepare an epidemic preparedness and response plan
- Work with the LGA Epidemic Preparedness and Response (EPR) Committee to prepare for responding to epidemics and other public health events.
- Set up contingency stocks of Medicines, vaccines, reagents and supplies
- Carry out risk mapping for outbreaks and Public Health events

5.0 Prepare to respond to outbreaks and other public health events

A public health emergency such as an acute outbreak or public health event calls for an immediate response. Being prepared to detect and respond to such an event is an essential role of the LGA. . When an outbreak of a priority disease occurs, the response is immediate. All efforts and resources are aimed at controlling the outbreak.

Examples of advanced preparations include: identifying key members of an event management team, mapping available resources, and estimating required supplies and procuring them.
If preparations have been done in advance, the health system will be able to function promptly, effectively and efficiently to prevent unnecessary deaths or disabilities due to epidemics and other public health events.

This section describes steps for:

- organizing preparedness activities in the LGA
- Set up contingency stocks of Medicines, vaccines, reagents and supplies

FIG 6: Epidemic Preparedness and Response Cycle
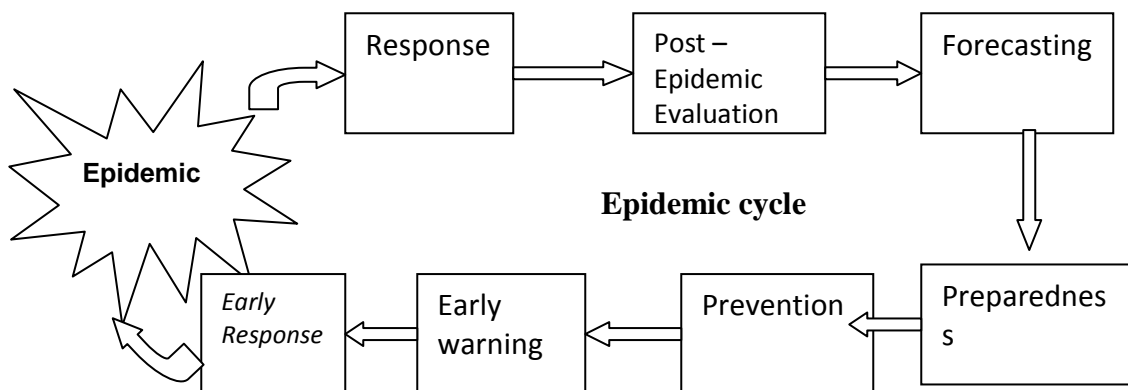
5.1 *Establish Epidemic Preparedness and Response (EPR) Committee*

EPR committees shall be established at all levels and strengthened where available with defined terms of reference, plan of action and operational guidelines. The committee shall meet on quarterly basis and when deemed necessary. Rapid response teams equipped with adequate resources and logistics for rapid intervention shall be established at all levels. Adequate funds shall be provided at all levels to secure contingency stocks of medicines, vaccines and supplies and for pre-positioning of emergency stocks.

Epidemic management protocol and Standard Operating Procedures (SOPs) shall be made available to health personnel at all levels. The EPR committee shall monitor LGA weekly data on epidemic prone diseases to prediction of impending epidemics.

5.1.1. National/State Epidemic Preparedness Response Committee Membership/Composition

- The DPRC shall be composed of:
- HMH/Hon. Commissioner for Health
- Director PHC/Public Health
- Director Hospital Services
- Director of Pharmaceutical Services
- Director of Nursing Services
- Director Medical Laboratory Services
- DG NEMA/Executive Secretary, SEMA
- CCE/State Epidemiologist.
- Director Finance
- Representative of partner agencies

Terms of Reference of State Epidemic Preparedness and Response Committee

• Plan and coordinate surveillance and epidemic response activities
• Resource mobilization.
• Meet regularly with the Epidemic Rapid Response Team.
• Monitor and evaluate response interventions.
• Review response plan where necessary.

5.1.2 Establish LGA Epidemic Preparedness and Response (EPR) Committee

LGA Epidemic Preparedness and Response (EPR) Committee work closely with their counterparts at the State and National levels to plan and monitor the implementation of EPR Plan. EPRCs are coordinating committees composed of technical and non-technical members from health and other sectors. The role of the EPRCs is to develop and oversee the implementation of emergency preparedness strategies, action plans, and procedures.

5.1.2a. Identify functions of the emergency management committee
The LGA's EPR Committee should meet to develop the LGA emergency preparedness and response plan. Once the plan is developed, the committee should periodically review and update the plan in response to any changes in technical, managerial or epidemiologic situations in the LGA.

The main functions of the LGA EPR committee are to:

- Develop/ review and approve LGA emergency preparedness and response plan that accounts for all potential emergencies including disease outbreaks and detection of other emergent public health events or hazards.

- Establish a community communications plan for sharing information with communities before, during, and after any public health emergency. The plan should also include a plan for disseminating information to the public and media about activities conducted for preparedness and during a response. The plan should also include liaison activities with relevant partners in multiple sectors including Points of Entry and other required reporting sites.

- Mobilize resources for emergency prevention and control including procurement of response and communication supplies. Plan to monitor the use of the resources before, during and after the emergency event.

- Support the procurement of emergency medicines, vaccines and other supplies within the LGA.

- Monitor resource utilization (Medicines, vaccines, supplies. Disinfectants, logistics and financial resources)

- Enhance linkages with community surveillance informants to ensure flow of data for early detection of public health events.

- Coordinate community risk mapping activities within the district and ensure all reporting sites are aware of the use of thresholds for reporting acute outbreaks or events.

- Coordinate training of community, health facility, and LGA personnel in emergency preparedness and response.

- Plan to periodically conduct emergency response simulation activities at the LGA and community levels.

- Coordinate the post-emergency evaluation and plan to disseminate findings with the affected communities.

5.1.2b Identify members of the LGA EPR Committee

At LGA level, the committee should comprise the following:

From the public sector:

- Chairman of the LGA
- Supervisory Councillor for Health
- MoH/PHC Coordinator
- DSN Officer
- NPHCDA Zonal Technical Officers (where applicable)
- Information Officer/Health Educator /Community Physician from the nearest General/ Teaching Hospital
- Pharmacist
- Divisional Police Officer
- Wildlife and veterinary experts

- Public Health Nurse
- Environmental Health Officer
- Laboratory Scientist /Technician /Scientific Officer

From Non-Governmental Organisations (NGO) with health care activities in the area:

- Representatives from community health programs and mission hospitals
- Representatives from other agencies operating in the LGA as necessary (e.g. Red Cross))

From the community:
- Representatives of the communities

From the private sector:

- Clinical or Nursing Officer from private hospital, clinic or laboratory
- Community Pharmacist / Patent Medicine Vendors

5.1.2c *Activities of a Functional LGA Epidemic Preparedness and Response (EPR) Committee*

LGA EPR Committee should periodically meet (whether or not there is an outbreak) to assess and review the epidemiological situation.

a. When there is no *outbreak*, the EPR Committee should:
- Hold quarterly meetings to assess the trends of epidemics and monitor the implementation of the IDSR plan
- Organize special preparatory meeting at the beginning of each epidemic season to review their level of preparedness.
- Share conclusion and recommendations of these meetings with the State level
- Organize simulation exercises/drills to test the operation plans

b. During an *emergency or outbreak* the EPR Committee should:

- Meet as soon as the epidemic is recognized.
- Hold daily meetings at the beginning of an outbreak/epidemic and weekly depending on the trend of the epidemic.
- Assess and request support if the situation is beyond the LGA's capacity
- Regularly review and improve the epidemic response to ensure the success of epidemic control actions.
- Prepare minutes after each meeting and forward a copy to the State level (minutes should be kept in a file for record purposes).
- Document and communicate epidemic response actions to next higher level

5.1.2d   Activities of the LGA Health Management Team (HMT) in outbreak/epidemic and events investigation and response

The LGA health management team is composed of the PHC coordinator and heads of the technical units in the LGA PHC department.

LGA health management team/staff should routinely:
1. Hold regular meeting with the LGA EPR Committee
2. Review surveillance data for trends that cause a concern for public health.
3. Make sure that health supervisors in all the health facilities in the LGA know and use protocols for recommended case management of priority diseases and conditions.
4. Review and update supplies and resources for epidemic response of priority diseases, including:
   - Presence of trained staff
   - Treatment equipment and supplies
   - Resources for transportation and communication
   - Supplies for collecting and transporting specimens for confirmation
   - Supplies for giving vaccinations
   - Procedures for procuring stocks of vaccine in an emergency and conducting a prompt vaccine response to an emergency
   - Creation of a budget line for epidemic response

5. Check stock of emergency medicines and supplies monthly, to verify the Medicines expiry date and make sure that all supplies are in good conditions (dry, clean and ready for use (good warehousing practices)). Please apply first to expire first out (FEFO) and First In First Out (FIFO) principles .ies

6. Ensure steps for obtaining laboratory confirmation are known by the appropriate staff.

7. Ensure health education and social mobilization in the risk areas just before the epidemic season.

5.2   Establish Rapid Response Team (RRT)

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

5.2.1 State Rapid Response Team (RRT) Composition

• Director PHC/Public Health
• State Epidemiologist.
• Medical Laboratory Scientist.
• Public Health Nurse
• Environmental Health officer
• Health Education Officer
• DSN Officer
• Representative of partner agencies

Terms of Reference of Rapid Response Team

• To verify any report of disease outbreak in the State
• To carryout outbreak investigation
• To propose and plan appropriate measures for containment of the epidemics to the State Disease Surveillance and response Committee
• To participate actively in implementation of epidemic prevention and control strategies
• To provide technical support to LGAs during outbreaks

5.2.2 Establish a LGA Rapid Response Team (RRT)

The LGA Health Management team should establish a LGA RRT in order to respond to epidemics promptly. The RRT provides technical support to the LGA health management team and the EPR Committee. The members of the team should:
- Be oriented on epidemic preparedness and response.
- Be provided with adequate logistics (vehicle, kit of Medicines, reagents, supplies, etc.)

The LGA health management team should update regularly the list of the members of the RRT.

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

5.2.3 Responsibilities of the LGA RRT

The LGA Rapid Response Team will be responsible for:
- Investigation of rumours/outbreaks and other public health events
- Proposing appropriate strategies and measures for the rapid containment of the epidemics
- Carrying out initial disease control measures to contain the outbreak
- Coordination of rapid response actions with partners and other agencies.
- Preparing detailed investigation report
- Contributing to the post epidemic evaluation of the outbreak response

5.2.4 Composition of the LGA Rapid Response Team

Members of the LGA Rapid Response Team (LGA RRT) should include:
- Medical Officer of Health/PHC Coordinator
- Epidemiologist or Public Health Officer
- Laboratory technologist/Technician / Scientific officers
- Clinician
- Environmental Health Officer
- Immunization Officers
- DSN Officers/M&E Officers (whichever is applicable)
- Wildlife and Veterinary Officer (for Zoonotic diseases)
- Pharmacist

- Others based on availability of Technical Staff and specificity of the outbreak.

5.3 Prepare Epidemic Preparedness and Response plan

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

This plan should:
- Be based on the assessment of epidemiological situation, needs and resources available for epidemic preparedness and response.
- Take into account diseases with epidemic potential in the LGA and in neighboring LGAs
- Provide estimates of the population at risk for epidemic-prone diseases/events
- Clearly indicate for each suspected outbreak which reference laboratory will be used for confirmation
- Provide estimates of quantities of Medicines, vaccines and supplies for each epidemic-prone disease/events likely to occur in the LGA be tested before implementation
- Include standard operating procedures (SOPS) in the training plan

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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

5.4 Set up contingency stocks of Medicines, vaccines, reagents and supplies

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

LGA at risk of outbreaks should:
- Set-up a contingency stock of Medicines, vaccines, reagents and supplies that they might need to manage the first cases without delay before receiving support from State and Federal levels.
- Regularly and carefully monitor the contingency stock in order to avoid shortages and expiration of Medicines, vaccines, reagents and supplies.

The content of the contingency stock varies with the nature of epidemic-prone diseases/events and the risk of outbreak in the LGA. A list of Medicines and supplies to be kept in the contingency stock are suggested at annex 5B

Examples of stock management tools are included in the annexes 5C, D and E at the end of this section.

5.4.1   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 quarterly) make sure the supplies are dry, clean, and ready to be used.

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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.

5.5   *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.
- 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.

Annexes to Section 5

ANNEX 5A   Outline for epidemic preparedness and response plan

PROPOSED OUTLINE OF EPIDEMIC PREPAREDNESS AND RESPONSE PLAN

Introduction
- Relevant background information of the LGA
- Epidemic-prone diseases
- Population at risk

Problems

Objectives

Strategies

Targets

Expected results

Activities

Responsible

Resources(human, financial and material)

Source of funding

Time frame

Critical factors

Monitoring and evaluation (indicators)

Annex 5B: List of some contingency stock of Medicines, vaccines, reagents and supplies for selected epidemic diseases

Supplies for **LGAs at risk of Anthrax outbreaks**

Medicines : Choose one antibiotic from the following list :
- Ciprofloxacin
- Penicillin V
- Benzyl Penicillin
- Tetracyclin
- Levofloxacin
- Doxycyclin
- Erythromycin

Disinfectant:
- Formaldehyde 10 %
- Methylated spirit

Supplies:
- Latex gloves
- Nose mask
- Protective eye glasses
- Personal Protective Equipment

N.B.   LGA health team should collaborate with veterinary services

Supplies for **LGAS at risk of Meningitis outbreaks due to N. meningitidis**

Medicines :
- 1g Ceftriaxone injection (IM/IV)
- oily Chloramphenicol,

Vaccines:
- AC
- ACW135

Supplies:
- Autodestruct/disable syringes
- Sterile tubes for CS fluid
- Transport media: Trans-Isolate
- Latex kit
- Gram stain kit
- May Grunwald Giemsa Kit

Supplies for LGAs at risk of Cholera outbreaks

Rehydration fluids:
- Oral rehydration salts
- Ringer lactate

Medicines (drug resistance should be taken into account):
- Doxycycline
- Trimethoprim-sulfamethoxazole

Supplies:
- Nasogastric tubes 5.3 mm OD, 50 cm
- Nasogastric tubes 2.7 mm OD, 38 cm
- Cannula: 23, 21 and 18 Gauges
- Scalp-vein sets

Materials:
- Cups
- Teaspoons
- Buckets

Disinfectants:
- Cresol
- Sodium hypochlorite (bleach)
- calcium hypochlorite

Laboratory supplies:
- Transport media (Cary-Blair)
- rectal swab
- Stool containers

Supplies for LGAs at risk of plague outbreaks

Medicines: Choose one antibiotic from the following list
    •   Streptomycin
    •   Tetracycline
    •   Doxycyclin
Insecticides: Choose one insecticide from the following list
    •   Permethrin
    •   Cypermethrin
    •   Malathion
Rodenticides: Choose one rodenticide from the following list
    •   Bromadione
    •   Brodifacom
Laboratory supplies
    •   Gram stain kit
    •   Rapid Test :dipstix (AgF1)
    •   Cary-Blair Transport media

Supplies for **LGAs at risk of bacillary dysentery outbreaks**

Rehydration fluids
- Oral rehydration salts
- Ringers lactate

Medicines (drug resistance should be taken into account)
- Metronidazole (Flagyl)
- Ciprofloxacin
- Amoxicillin
- Cotrimoxazole

Disinfectants
- 2 % Chlorine

Laboratory supplies
- Transport media (Cary-Blair)
- Stool containers
- Rectal swab

Supplies for **LGAs at risk of yellow fever outbreaks**

Re-hydration fluids
- Oral rehydration salts
- Ringers lactate

Medicines
- Paracetamol
- Diazepam

Vaccines:
- Yellow fever vaccines

Supplies
- Mosquito nets
- Laboratory supplies
    - Needles (different sizes)
    - Tubes (vacutainers) for serum collection
    - Syringes

Supplies for **LGAs at risk of Viral Haemorrhagic(Lassa) fever outbreaks**

Medicines and disinfectants
- Ribavirin Injection
- Ribavirin tablet (PEP)
- Medicines for supportive care
- Ringers lactate
- Metronidazole (flagyl)
- Oral Rehydration salts
- Bleach

Protective clothing
- Boots
- Gloves (thin, thick)
- Outer gown
- Plastic apron
- Mask
- Head cover
- Protective eyewear
- Bed nets
- Etc.

Equipment
- Sprayers
- Plastic sheets for mattress and barriers
- Waterproof mattresses
- Front lamp
- Kerosene lamp
- Body bags
- Buckets and containers
- Electric generator
- Laboratory supplies
  - Needles (different sizes)
  - Syringes
  - Tubes (vacutainers) for blood collection
  - Antiseptic

Supplies for **LGAs at risk of Influenza Type A/H5N1 or A/H1N1outbreaks**

Medicines and disinfectants
- Antivirals (Tamiflu)
- Medicines for supportive care e.g. antibiotics)
- Disinfectants

Personal Protective Equipment (PPE)
- Boots or boot covers
- Gloves (thin, thick)
- Outer gown
- Plastic apron
- N95 Respirators
- Mask
- Head cover
- Protective eyewear
- Biohazard disposal bags
- Etc.

Equipment
- **Sample collection bottles containing viral transport medium (VTM)**
- **Swab sticks for Nasopharyngeal and Oro-pharyngeal sample collection**

<div align="center">Measles</div>

Medicines
Vitamin A. (100,000 IU)
Paracetamol syrup
Chloramphenicol eye ointment
Caramel lotion
Vitamin C

Vaccines
Measles vaccines

Supplies
Antiseptics

ANNEX 5C: Inventory Management Control Record

	Surveillance and Epidemic Preparedness and Response: Stock Situation Report						
	Year:						
	Date of Reporting (day/mm/yyyy):						
	Reporting period:						
	Name of facility/site:						
	LGA:						
	State:						
	Country:						
	Unit of issue:						
Product Description	**Beginning balance**	**Quantity received**	Losses and adjustment	**Stock on hand**	**Quantity issued**	**Ending Balance**	**Observations, decisions and recommendations**

	Name, Designation and Signature of Responsible Officer:

ANNEX 5D   *IDSR stock item transaction and balance sheet*

IDSR Stock Item Transaction and Balance Sheet																	
Laboratory or Warehouse Name	**Item Description (Name)**	**Pack size (unit of issue)**	**Expiry date**	**Manufacturer**	**Batch number**	**Location in store**	**Airway bill**	**Allotment number**	**Shipment & operations cost (=N=)**	**Date received (Day/Month/Year)**	**Quantity received**	**Name of Donor or Supplier**	**Quantity issued**	**Name of receiving facility (site)**	**Stock Balance**	**Signature (Name and designation)**	**Observations/ Remarks**
															0		Inventory
Use one sheet by stock item, and update the sheet every time any transaction takes place																	

5E: Stock card

Name of facility   Product code:
Product description:_____   batch No:
(name, strength, dosage form)

Unit of issue: Expiration date:
Minimum stock level: Location/shelf no:
Maximum stock level:

Date	Voucher/ref no	Received from/ Issued to	Pack size	Quantity			Stock balance	Signature	Remark
				received	Issued	Losses and adjustment			

Section 6: Respond to outbreaks and other public health events

This section describes how to:

- Convene the LGA EPR committee meeting and Select appropriate public health response
- Mobilize response teams for immediate action
- Implement response activities
- Put in place standard infection control measures.
- Provide regular situation reports on the outbreak and events
- Document the response

6.0 Respond to outbreaks and other public health events

The goal of an integrated disease surveillance and response is to use data for public health action. When an outbreak, acute public health event or condition is detected, an investigation should take place to determine the cause of the problem. The results of the investigation should guide the selection of the response. Most disease prevention and control programs promote recommended response actions such as conducting a mass immunization campaign for a vaccine-preventable disease, strengthening nutritional support and feeding practices for children with malnutrition, or administering anti-malarial, antibiotic or antiviral treatments as indicated. Successful responses are carried out with community involvement and often include a community education and behavior change component. Regardless of the specific recommended response, the LGA's role in selecting and implementing a recommended response is essential for safe-guarding the health and well-being of communities in the LGA.

As a result of the International Health Regulations, LGAs are also involved in response to other infectious, zoonotic, chemical, radio-nuclear and other unknown events if they are detected.

This section will describe steps for conducting a public health response and provide general directions for immediate response actions for leading causes of illness, death and disability. Please consult relevant WHO guidelines for responding to chemical and radio-nuclear events.

6.1 Convene the LGA EPR Committee meeting

Once the epidemic is confirmed, the LGA HMT calls a meeting of the EPR Committee as part of the preparation of the response. Depending on the scope of the disease or public health event outbreak the SMoH and or FMoH may necessarily be involved in the response activity. Other agencies like State and National Emergency Management Agency (SEMA/NEMA) may have a role to play.

The following steps should take place:

1. Report the outbreak or event to the next higher level. It is likely that the outbreak has already been reported to the next level and coordination has been ongoing with the investigation.
2. Take every opportunity to communicate with the designated level that is providing coordination for the response.
3. Request outbreak or event response funds to be released.
4. Alert nearby LGA about the outbreak. If they are reporting a similar outbreak, coordinate response efforts with them.
5. Assign clear responsibilities to individuals or teams for specific response activities.
6. Provide orientation or training along with adequate supplies of relevant supplies for the LGA response team and affected health facility staff.
7. The national level in collaboration with the LGA will assess whether the event is a potential public health event of international concern (PHEIC) using the decision instrument.
8. Review existing resources as defined in the preparedness plan. Determine what additional resources are required. For example, consider:
   - Human resources that could be mobilized to manage the epidemic
   - Funds to support response activities
   - Emergency stocks or required drugs and other medical supplies
   - Laboratory support for confirmation of pathogens responsible for the epidemics. If the LGA does not have the capacity to collect, package and ship the specimen, cont.act the reference laboratory for assistance.
9. Mobilize logistics support (travel of rapid response team, accommodation arrangement, communication, other essential equipment)
10. **Identify areas or populations at high risk for the current epidemic/event.**
11. Provide orientation/training and supplies to the LGA response team and health facility staff to be able to:
   - Keep detailed records on the response activities
   - Review data on cases and treatment throughout the response activity

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

12. If supplies are not available locally:
    - Contact the State to request alternate suppliers
    - Borrow from other services, activities, or non-governmental organizations in your area
    - Identify practical low-cost substitutes.

6.1.1 Select appropriate public health response

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

Refer to Section 9 and national disease specific guidelines to select response activities, which involve:

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

 For example, response activities for particular outbreaks or public health problems or events include the following:
- Conduct emergency vaccination campaigns, when recommended
- Provide relevant chemoprophylaxis and vaccination for health workers
- Improve access to clean water
- Improve safe disposal of human waste
- Improve food handling practices
- Reduce exposure to mosquitoes and other vectors
- Control vectors

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6.2   *Mobilize response teams for immediate action*

Rapid response teams should have already been identified during preparedness activities. Mobilize the teams and make sure that the membership of the team reflects the technical needs of the response. Refer to Section 5 of these guidelines for recommendations on the composition of the rapid response team and the team's roles and responsibilities.

6.3. Implement response activities

Implementing a response means carrying out the operational steps so the actions take place as planned. Regardless of the specific causes of the outbreak or event, the success of the response relies on the success of general factors such as case management, provision of supplies, and trained health staff. The selected response activities common factors for responding to outbreaks or public health events include the following:

6.3.1 Strengthen case management and infection control measures

Take steps to support improved clinical practices in the LGA. Review the recommendations in Annex 6A for treating cases during an outbreak. Prepare health workers to conduct these responses.

- Review with each health facility whether the clinical staff know and use recommended protocols for case management of outbreak diseases.
- Make sure that clinicians receive results of laboratory confirmation where necessary.
- In a large epidemic, ask the medical officer at each health facility to identify an area that can be used to accommodate a large number of patients.
- Provide Standard Operating Procedures that include Infection control guidelines.
- Implement infection control and risk mitigation measures, for example:
    - Establish an isolation ward for highly infectious diseases (Lassa, Cholera, SARS, etc.)
    - Ensure health staff access to safety and personal protective measures for any infectious diseases (especially for Lassa and SARS).

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- Make the necessary medicines and treatment supplies available.

6.3.2 Update health staff skills

Provide opportunities for health staff to receive information and updates on the outbreak or event case definition, case management procedures, reporting process and required data elements. It is essential that members of the rapid response team are aware of and have access to any indicated personal protection equipment and infection control practices indicated by the disease involved in the response. If there are immunization requirements for responding to the particular disease or condition, ensure that rapid responders are up-to-date with indicated immunizations.

To update the health staff and rapid response team:

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

3. Conduct training
   - Orient or reorient the LGA epidemic management committee, rapid response team and other health and non-health personnel on epidemic management based on the current epidemic.
   - In an urgent situation, there often is not time for formal training. Provide on-the-job training as needed. Make sure there is an

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opportunity for the training physician or nursing staff to observe the trainees using the updated or new skill.

- Monitor participant performance and review skills as needed

6.3.3   Enhance surveillance during the response

During a response to an outbreak, encourage health staff at all health facilities to be vigilant in surveillance of the disease or condition. For example, members of the response teams and health staff in affected facilities should:

- Search for additional persons who have the specific disease and refer them to the health facility or treatment centres, or if necessary quarantine the household and manage the patient.
- Ensure timely exchange of laboratory information with the team
- Update the line list, make data analysis by time (epi-curve), person (age and sex) and place (mapping cases).
- Monitor the effectiveness of the outbreak or response activity.
- Report daily at the beginning of the epidemic. Once the epidemic matures, the committee can decide on a different frequency of reporting.
- Actively trace and follow up contacts as indicated

6.3.4   Inform and educate the community

Effective risk communication is an essential element of managing public health events. When the public is at risk of a real or potential health threat, treatment options may be limited, direct interventions may take time to organize, and resources may be few. Communicating advice and guidance, therefore, may be the most important public health tool in managing a risk.

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

1. Decide what to communicate by referring to disease specific recommendations in Section 9. Make sure to include:

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

2. Decide how to state the message. Make sure that the messages:
   - Use local terminology
   - Are culturally sensitive and acceptable
   - Are clear and concise
   - Work with local traditions
   - Address beliefs about the disease.

   Sample community education messages are in Annex 6B at the end of this section.

3. Select appropriate communication methods that are present in your LGA. For example,
   - Mass media, (radio, television, newspapers)
   - Meetings (health personnel, community, religious, opinion and political leaders)
   - Educational and communication materials (posters, fliers)
   - Multi-media presentations (for example, films, video or narrated slide presentations) at the markets, health centres, schools, women's and other community groups, service organizations, religious centres.

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

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

6. Select and use a community liaison officer, focal point, or health workers to serve as spokesperson to the media. As soon as the outbreak has been recognized:

- Tell the media the name of the spokesperson, and that all information about the outbreak will be provided by the spokesperson
- Release information to the media only through the spokesperson to make sure that the community receives clear and consistent information.

7. On a regular basis, meet with the community spokesperson to give:
   - Frequent, up-to-date information on the outbreak and response
   - Clear and simple health messages that the media should use without editing
   - Clear instructions to communicate to the media only the information and health education messages from by the Epidemic Response Committee.

6.3.5 Conduct a mass vaccination campaign

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

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

A worksheet called "Planning a mass vaccination campaign" is inAnnex 6C at the end of this section.

A worksheet called "estimating vaccine supplies for vaccination activities in Annex 6D at the end of this section. Annex 6E describes recommended vaccination practices for use during the vaccination campaign.

6.3.6 Improve access to safe water

Containers that hold drinking water can be the vehicle for disease outbreaks including Cholera, Typhoid Fever, Shigellosis and Hepatitis. Make sure the community has an adequate supply of safe water for drinking and other uses. The daily water needs per person during non-outbreak situations are shown below.

Water needs are much higher during an outbreak situation, especially outbreaks of diarrhoeal diseases.

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

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

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

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

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

- Community education on how to keep home drinking water safe. Refer to Annex 34 or sample community messages and references to specific prevention guidelines for preparing safe water at home

- Containers that prevent contamination of water. For example, provide containers with narrow mouths so that people cannot contaminate the water by putting their hands into the container
- Location site for defecation at least 30 metres or more away from sources of water

6.3.7. Ensure safe disposal of human excreta

To make sure that human excreta are disposed safely to avoid secondary infections due to contact with contaminated substances:

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

6.3.8 Improve food handling practices

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

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

6.3.9. Reduce exposures to infectious and environmental hazards

As indicated by the outbreak or event, take action to reduce exposure to hazards or factors contributing to the outbreak or event. This may involve chemical, physical or biological agents. Technical requirements for reducing exposure will be determined according to national policy and through collaboration with those who have experience in these areas. For example, occupational or industrial exposure to heavy metals (for example, lead) will require coordination with multiple ministries and partners. Community education and behaviour change interventions can be supportive in engaging the community to affect changes that will limit exposure to dangerous levels of chemicals and other hazards.

For vector-borne diseases, engage the service of experts such as an entomologist in designing appropriate interventions that will reduce exposure to the offending vectors (for example, for mosquito borne-illness) work with the malaria control program in your LGA to:

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- Conduct community education on the proper use of bed nets and how to avoid dusk-to-dawn mosquito bites.
- Promote the use of locally available ITNs and other insecticide treated materials (blankets, clothes, sheets, curtains, etc.)

LGA work with the environmental health officer and other relevant staff in your LGA to encourage the community to:

- Avoid contact with the rodents, urines, droppings and other secretions
- Keep food and water in the home covered to prevent contamination by rodents
- Keep the home and cooking area clean and tidy to reduce possibilities of rodents nesting in the room.
- Use chemicals (insecticides, rodenticides, larvicides etc.) and traps as appropriate based on environmental and entomological assessment.

6.3.10. Ensure appropriate and adequate logistics and supplies

Throughout the outbreak, monitor the effectiveness of the logistics system and delivery of essential supplies and materials. Carry out logistical planning to make sure transport is used in the most efficient ways. Monitor the reliability of communication between teams during the outbreak and if additional equipment is needed (for example, additional minutes for mobile phones), take action to provide teams what they need to carry out the response actions.

Monitoring the implementation of the outbreak or event is key for outbreak control. The monitoring results will be important for including in the report of response to supervisory levels, to community leaders and for future advocacy.

For example, make sure there is ongoing monitoring of:
- Disease trends in order to assess the effectiveness of the response measures, the extension of the epidemic and risk factors
- Effectiveness of the response: case fatality rate, incidence
- Implementation of the response: program coverage, meetings of the epidemic management committee etc.
- Availability and use of adequate resources, supplies and equipment

6.3 11. Monitor the course of the epidemic throughout the duration.

Monitoring of the epidemic is critical to outbreak control. The following are some of the elements to be monitored:
- Disease trends: epi-curve
  This is important to assess the effectiveness of the response measures, the extension of the epidemic and risk factors
- Resource assessment (rational utilization, adequacy and sufficiency) and determination of additional needs
- Implementation of the response: program coverage, meetings of the EPR Committee etc
- Effectiveness of the response: case fatality rate, incidence

6.4   Provide regular situation reports on the outbreak and events

A detailed report on the outbreak can be helpful in planning for the next outbreak (refer to Annex 6G). .
As soon as the epidemic has been controlled, write a report and include:
- Details of the response activities. Dates, places, and individuals involved in each activity. Also include the "Epi" curve, spot map, table of person analyses, and the line list of cases
- Any changes that were made to the initial response activities: -
- Recommend changes to improve epidemic response in the future. For example,
  o changes in the vaccination strategy and program to make the vaccination activity more effective.
  o changes in the transporting procedure for laboratory specimens to allow specimens to reach the reference laboratory in good condition or more quickly
- Disseminate a report on the outbreak

The format of the report is in the Annex 36A section 6.

6.5   Evaluate and document the epidemic response

6.5.1 Evaluate the readiness to respond to an epidemic

The following are the key elements for the evaluation:
- The presence of an epidemic preparedness and response plan
- Availability of emergency stocks of drugs, vaccines and supplies during the last 6 months
- Availability of funds for outbreak response
- Presence of a well equipped trained LGA RRT to conduct an outbreak investigation
- Presence of a functional EPR Committee and RRT
- Availability of trained/oriented health staff for the response

These elements should be followed up during integrated supervisory visits.

6.5.2 Evaluate epidemic control activities

At the end of the outbreak/epidemic the National/State team in collaboration with the LGA EPR Committee should evaluate control activities. This evaluation should focus on jthe appropriateness of control actions as well as their timeliness and effectiveness.

This evaluation exercise should help to answer the following questions:

Evaluation of outbreak/epidemic control activities

Appropriateness
«Were the control activities appropriate as recommended by specific guidelines?

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

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

Level of resources mobilised
«Were enough resources mobilised in terms of: personnel, drugs, vaccines, reagents, supplies, materials, money, etc?

Annex 36B of section 6 provides answers to the above questions.

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

6.5.3 Document the outbreak/epidemic

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

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

Annexes to Section 6

ANNEX 6A   Treat cases during an outbreak

ANNEX 6B: Prepare disinfectant solutions by using other chlorine products

ANNEX 6C   Planning an emergency immunization campaign

ANNEX 6D   Estimating vaccine supplies for immunization activities

ANNEX 6E   Recommended immunization practices

ANNEX 6F   Sample messages for community education
- Hand-washing
- Safe handling of food
- Safe disposal of human waste
- Clean drinking water and storage
- Safe burial of bodies
- Reducing exposure to mosquitoes

ANNEX 6G   Communications under IHR requirements

Annex 6A Treat cases during an outbreak

Use appropriate drugs and treatments for managing cases during an outbreak. These are treatment recommendations for use in an outbreak situation for Cholera, Dysentery, Measles and Bacterial meningitis.

1. Treat Cholera in an outbreak situation

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

1. Assess the patient's level of dehydration. See assessment guide below.
2. Give fluids according to the appropriate treatment plan (see next page).
3. Collect a stool specimen from the first 5 suspected Cholera patients that are seen in the health facility.
4. Give an oral antibiotic to patients with severe dehydration.

Assess the patient for signs of dehydration

- Look at patient's general condition: Is the patient lethargic or unconscious?Restless and irritable?
- Look for sunken eyes.
- Offer the patient fluid. Is the patient not able to drink or drink poorly, drink eagerly or thirsty?
- Pinch the skin of the abdomen. Does it go back very slowly (longer than 2 seconds?) or slowly?

Decide if the patient has severe, some or no signs of dehydration and give extra fluid according to the treatment plan

If two of the following signs are present: • lethargic or unconscious • sunken eyes • not able to drink or drinking poorly • skin pinch goes back very slowly	**SEVERE DEHYDRATION*** Give fluid for severe dehydration (Plan C)
*In adults and children older than 5 years, other signs for severe dehydration are "absent radial pulse" and "low blood pressure".	
If two of the following signs are present: • restless, irritable • sunken eyes • drinks eagerly, thirsty • skin pinch goes back slowly	**SOME DEHYDRATION** Give fluid according to for some dehydration (Plan B)
If there are not enough signs to classify as some or severe dehydration	**NO DEHYDRATION** Give fluid and food to treat diarrhoea at home. (Plan A)

☐ **Give antibiotics recommended for treatment of severely dehydrated Cholera Patients**		
Antibiotic	**Children**	**Adults**
Doxycycline *one single dose*	–	300 mg[1]
Tetracycline* *6hourly x 3 days*	12.5 mg per kg	500 mg
Trimethoprim-sulfamethoxazole (TMP-SMX) *12hourly x 3 days*	TMP 5 mg per kg and SMX 25 mg per kg[2]	TMP 160 mg and SMX 800 mg
Furazolidone *6hourly x 3 days*	1.25 mg per kg	100 mg[3]
Erythromycin <u>*adults*</u>*: 6hourly x3 days* <u>*children*</u>*: 8hourly x3 days*	10 mg per kg	250 mg

(***Tetracyclines are not recommended for treatment in children younger than 8 years of age. Source: WHO Expert Committee on the Selection and Use of Essential Medicines, Geneva 2008**)

- If the patient vomits while taking fluid, wait 10 minutes. Then allow the patient to resume feeding, but more slowly.
- Continue monitoring the patient and replacing fluid until the diarrhoea stops.
- When the patient is ready to leave the facility, counsel the patient on treating diarrhoea at home.
- Refer to IMCI guidelines for treating children under 5 years of age and to national guidelines for further information on treating acute watery diarrhoea and confirmed cholera.

Plan A: Treat diarrhoea at home

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

[2] TMP-SMX is WHO's antibiotic of choice for children. Tetracycline is equally effective. However, in some countries, it is not available for paediatric use.

[3]Furazolidone is WHO's antibiotic of choice for pregnant women.

If patients showed no signs of dehydration when they were first assessed, they may be treated at home. Give a 2-day supply of ORS and explain how to take the ORS solution according to the following schedule: Advise the mother to give extra fluid; give zinc supplements and continue feeding.

AGE	Amount of solution after each loose stool	Provide enough ORS packets for preparing:
Up to 2 years	50 to 100 ml after each loose stool	500 ml per day
2 years up to 10 years	100 to 200 ml after each loose stool	1000 ml per day
10 years or more	As much as the patient wants	2000 ml per day

☐ Plan B: Treat some dehydration with ORS

In the clinic, give the recommended amount of ORS over a 4-hour period. Determine the amount according to the patient's weight. Use the patient's age only when the weight is not known.

☐Determine the amount of ORS to give during the first 4 hours						
AGE or WEIGHT	Up to 4 months	4 months up to12 months	12 months up to 2 years	2 years up to 5 years	5 years up to 14 years	15 years and more
Weight in kg	< 6 kg	6 - < 10 kg	10 - < 12 kg	12 - < 19 kg	19 – 30 kg	30 kg and more
Give this amount of ORS	200 – 400 ml	400 - 700 ml	700- 900 ml	900 -400 ml	1400-2200 ml	2200-4000 ml

- If the patient wants more ORS than shown, give more.
- For infants under 6 months who are not breast-fed, also give 100-200 ml of clean water during this period.
- Give frequent small sips from a cup.
- If the patient vomits, wait for 10 minutes, then continue giving fluids, but more slowly.
- For infants who are breast-feeding, continue breast-feeding whenever the infant wants.
- Assess patients every 1-2 hours to make sure they are taking ORS adequately and to monitor fluid loss. Completely reassess the patient's dehydration status after 4 hours, and follow the appropriate treatment plan for the patient's dehydration classification.

Plan C: Treat severe dehydration quickly

1.   Start intravenous fluids immediately. If the patient is a child and can drink, give ORS by mouth while the drip is set up. Give 100 ml per kg of Ringer's Lactate Solution divided as follows:

For giving IV fluids:		
	First:	*Then:*
For **adults** (and patients 1 year and older), give 100 ml per kg IV within 3 hours as follows:	First, give 30 ml/kg as rapidly as possible within 30 minutes	Then, give 70 ml per kg during the next 2 ½ hours
For **patients less than 1 year**, give 100 ml per kg IV in 6 hours as follows:	First, give 30 ml per kg in the first hour*	Then, give 70 ml per kg in the next 5 hours

* Repeat once if radial pulse is still very weak or not detectable after the first 30 ml per kg is given.

2.   Reassess the patient after the first 30 ml per kg, and then every 1 to 2 hours. If hydration status is not improving, give the IV drip more rapidly.
3.   Also give ORS (about 5 ml per kg per hour) as soon as the patient can drink. This is usually after 3 to 4 hours for infants and after 1 to 2 hours for patients older than one year.
4.   Reassess the patient after 6 hours (for infants) or 3 hours (for one year and older). Classify the dehydration. Then choose the appropriate plan (Plan A, Plan B, Plan C) to continue treatment.
5.   Give antibiotics recommended for treatment of severely dehydrated Cholera patients.
6.   Give patients information about home care before they leave the health facility.
   - If the patient vomits while taking ORS, wait 10 minutes and then continue giving fluids more slowly.
   - Continue breast-feeding of infants and young children.
   - Return for treatment if the patient develops any of the following:
     - increased number of watery stools
     - eating or drinking poorly
     - marked thirst
     - repeated vomiting
     - fever
     - blood in the stool

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2. **Give an appropriate oral antibiotic for outbreaks of bloody diarrhoea due to *Shigella dysentariae* type 1.**

Antimicrobial	Treatment schedule	
	in children	in adults
First line		
Ciprofloxacin	15 mg/kg	500 mg
	12 hourly x 3 days	
Second line		
Pivmecillinam	20 mg/kg	100 mg
	6hourly x 5 days	
Ceftriaxone*	50-100 mg/kg	-
	Once a day IM for 2 to 5 days	
Azithromycin*	6-20 mg/kg	1-1.5 g
	Once a day for 1 to 5 days	

*They should only be used when local strains of *Shigella*are known to be resistant to ciprofloxacin.
Source: *WHO Guidelines for the control of epidemics due to S. dysentariae type 1. WHO Geneva. 2005*

3.   Give vitamin A to children with Measles

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

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

AGE	Vitamin A Capsules		
	200 000 IU	100 000 IU	50 000 IU
Up to 6 months		½ capsule	1 capsule
6 months up to 12 months	½ capsule	1 capsule	2 capsules
12 months up to 5 years	1 capsule	2 capsules	4 capsules

4.   Give appropriate antibiotic for bacterial Meningitis cases during an outbreak

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

1.   Admit patient to a health facility for diagnosis and treatment.
2.   Start an antibiotic immediately. Intra-muscular injectable oily Chloramphenicol is best choice during an epidemic. It is very effective and a single dose is usually effective. If injectable treatment is not possible, give oral Amoxicillin or Cotrimoxazole or treat with an antimicrobial recommended by national treatment guidelines for meningitis.
3.   Patient isolation is not necessary. Provide good supportive care and simplify case management.

►Give a single dose of oily Chloramphenicol

AGE	INTRAMUSCULAR OILY CHLORAMPHENICOL 100 mg per kg in a single dose, If the patient has not improved, give a second dose 24 to 48 hours later.	
	Dose in grams	Dose in millilitres
Adult: age 15 years and older	3.0 g	12 ml
Child: 10 to 14 years	2.5 g	10 ml
6 to 9 years	2.0 g	8 ml
3 to 5 years	1.5 g	6 ml
1 to 2 years	1.0 g	4 ml
2 to 11 months	0.5 g	2 ml
1 to 8 weeks	0.25 g	1 ml

►Other recommended antibiotics to treat meningitis

Agent	Route	Dose for adults	Dose for children	Duration of treatment
Penicillin G	IV	3-4 MU daily, every 4-6 hours	400 000 Units/ kg	4 days
Ampicillin or Amoxicillin	IV	2-3 g daily every 6 hours	250 mg per kg	4 days
Amoxicillin	Oral	2-3 g every 6 hours	250 mg per kg	4 days
Chloramphenicol	IV	1 g every 8-12 hours	100 mg per kg	4 days
Cefotaxime	IV	2 g every 6 hours	250 mg per kg	4 days
Ceftriaxone	IV	1-2 g over 12-24 hours	50-80 mg per kg	4 days
Ceftriaxone	IM	1-2 g single dose	50-80 mg per kg	1-2 days

5. The treatment of human cases of yellow fever is chiefly supportive because it has no specific therapy.

The medical care has to be considered at two levels: peripheral and hospital health care.

Peripheral health care
- Fever and headache: give paracetamol. Avoid aspirin because of the bleeding diathesis
- Vomiting, abdominal pain, hiccups: administer Metoclopramide (by rectal suppository)
- Restlessness: Diazepam
- Dehydration: Oral fluids-ORS, IV fluids- 5-10% glucose in saline or Ringer's solution

Hospital health care
- Bleeding: Blood transfusion
- Delirium: Diazepam
- Shock: IV fluids
- Treat all associated infections

6. The only known specific treatment for Lassa fever is Rivabirin.

Intra venous Ribavirin treatment should start as soon as diagnosis of Lassa fever is made. The patient should be isolated and barrier nursed. First give a single "loading" dose of 33mg per kg body weight.
Then every six hours give 16mg per Kg body weight for four days. Then every eight hours give 8mg per kg body weight for six days. Total treatment time is therefore ten days. Treatment chart should be completed for each individual patient clearly laying out the correct amount to give for each dose.

Intra-venous Ribavirin Treatment Chart

Name   Weight

Dose Calculation

Load dose	33mg/kg body weight	100mg/ml = ---------ml
Day 1-4	16mg/kg body weight	100mg/ml= --------- ml 6 hourly
Day 5-10	8mg/kg body weight	100mg/ml= - --------ml 8 hourly

- Day 1 to 4   Dose at 6 hourly intervals
- Day 5 to 10   Dose at 8 hourly intervals

Day 1	Date	Time	Dose (ml)	**Day 5**	Date	Time	Dose (ml)
Dose 1							Dose 1
Dose 2							Dose 2
Dose 3							Dose 3
Dose 4							

Day 2	Date	Time	Dose (ml)	**Day 6**	Date	Time	Dose (ml)
Dose 1							Dose 1
Dose 2							Dose 2
Dose 3							Dose 3
Dose 4							

Day 3	Date	Time	Dose (ml)	**Day 7**	Date	Time	Dose (ml)
Dose 1							Dose 1
Dose 2							Dose 2
Dose 3							Dose 3
Dose 4							

Day 4	Date	Time	Dose (ml)	**Day 8**	Date	Time	Dose (ml)
Dose 1							Dose 1
Dose 2							Dose 2
Dose 3							Dose 3
Dose 4							

				Day 9	Date	Time	Dose (ml)
							Dose 1
							Dose 2
							Dose 3

				Day 10	Date	Time
				Dose (ml)		
				Dose 1		
				Dose 2		
				Dose 3		

There is no side effect and contraindication to Ribavirin. Once started, a Ribavirin treatment should not be discontinued until the ten-day course is complete.

Supportive treatment should include:
Paracetamol
Vitamn K (phytometadione)
Haemaceal
Ringers Lactate
Quinine Lactate
Quinine Injection (systematic for malaria endemic regions)
Antibiotic I.V. to start then orally
Feeding through NG tube if necessary
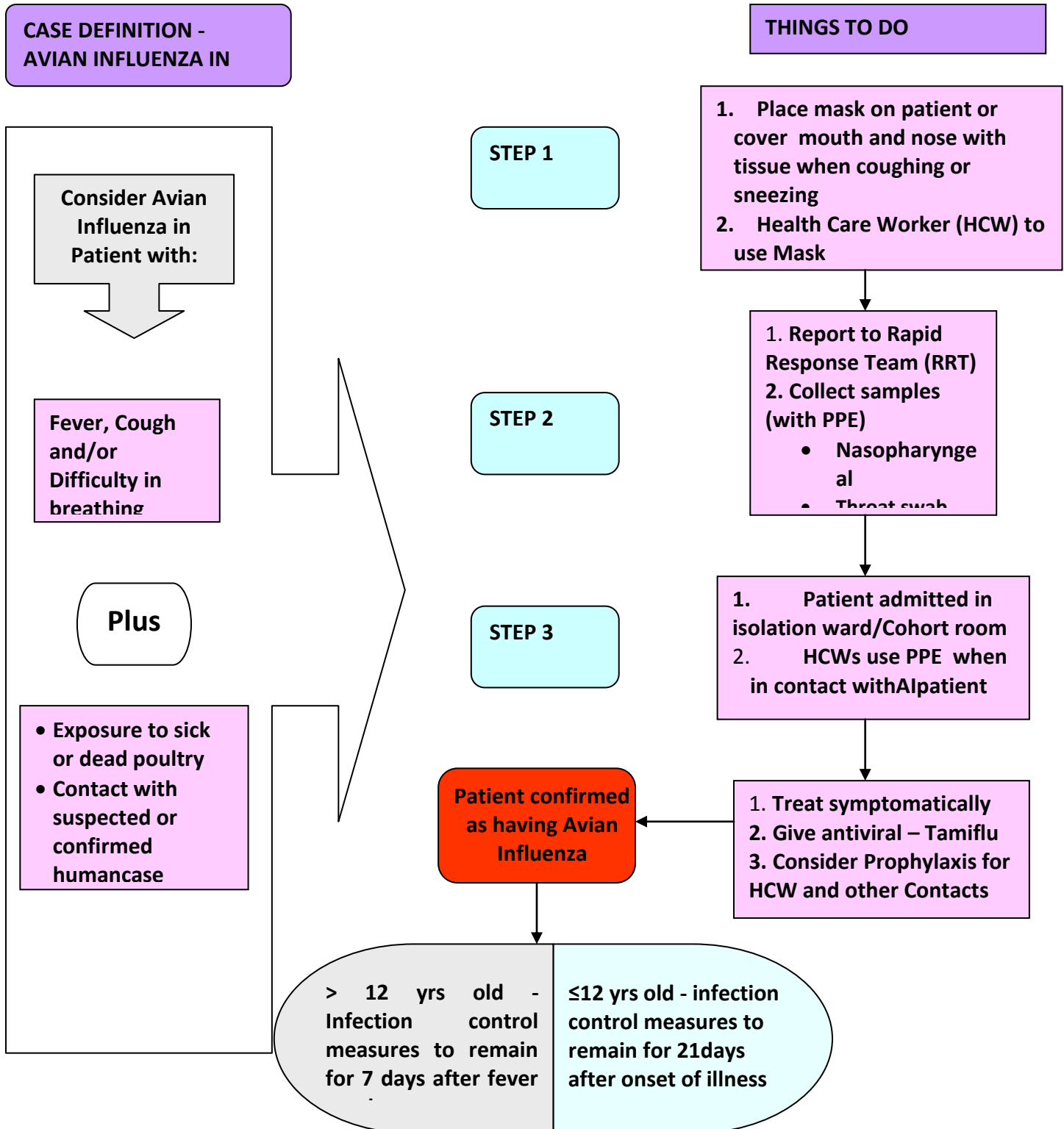Methergin if delivery
If the patient is severely anaemic (Hb<5) then consider blood transfusion

Remember to protect yourself, your staff and the patient's relatives when you are treating Lassa fever. !!

PROTOCOL FOR CLINICAL MANAGEMENT OF HUMAN CASE OF AVIAN INFLUENZA (AI)

FIG: HEALTH FACILITY FLOW CHART OF SUSPECTED HUMAN CASE OF AVIAN INFLUENZA

CASE DEFINITION - AVIAN INFLUENZA IN

THINGS TO DO

Consider Avian Influenza in Patient with:

Fever, Cough and/or Difficulty in breathing

Plus

- Exposure to sick or dead poultry
- Contact with suspected or confirmed human case

STEP 1

1. Place mask on patient or cover mouth and nose with tissue when coughing or sneezing
2. Health Care Worker (HCW) to use Mask

STEP 2

1. Report to Rapid Response Team (RRT)
2. Collect samples (with PPE)
   - Nasopharyngeal
   - Throat swab

STEP 3

1. Patient admitted in isolation ward/Cohort room
2. HCWs use PPE when in contact with AI patient

1. Treat symptomatically
2. Give antiviral – Tamiflu
3. Consider Prophylaxis for HCW and other Contacts

Patient confirmed as having Avian Influenza

| > 12 yrs old - Infection control measures to remain for 7 days after fever | ≤12 yrs old - infection control measures to remain for 21days after onset of illness |

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Managing a "Suspect" Human Case of Influenza Type A/H5N1 or A/H1N1

- HCW attending to a case should wear PPE (gloves, coverall/gown, N95 mask, goggles, head cover + boots and apron if splashes expected)

- Patient to be admitted and isolated:

  a) Suspected cases should be isolated in single rooms

  b) Where isolation is not possible, multi-bed (cohort) rooms can be used. In that case, beds should be at least 1 metre apart or separated by a physical separator such as a partition. No mixing of suspected with confirmed cases.

  c) Conduct full clinical assessment:

- Collect nasopharyngeal and oro-pharyngeal specimen and transport (handling) to appropriate HI laboratory

- Commence antiviral therapy immediately after specimen collection without waiting for lab results:

- For adults -   Oseltamivir 75mg twice daily for 5 days

- For children -   Oseltamivir according to weight

≤ 15kg	:	30mg
> 15 – 23kg	:	45 mg
> 23 – 40kg	:	60mg
>40kg	:	75mg

  twice daily for 5 days

- Consider initiating antibiotics where appropriate.

- Institute other supplementary measures: antipyretics, fluid replenishments, oxygen, consideration of mechanical ventilation where indicated, etc.

Prophylaxis for Contacts:

Prophylaxis for Adults - Oseltamivir 75mg daily for 7-10 days

Children – weight adjusted dose for 7-10 day

NB:

During clinical management of Human Influenza A/H5N1 or A/H1N1 case standard precautions should be adhered to according to infection control guidelines. See SOP on infection control in AI.

Observe infection control measures when handling corpse (see SOP).

ANNEX 6B   Preparing disinfectant solutions by using other Chlorine products

During a response to an outbreak of any disease transmitted through direct contact with infectious body fluids (blood, urine, stool, semen, and sputum for example), an inexpensive system can be set up using ordinary household bleach.

The following table describes how to make 1:10 and 1:100 chlorine solutions from household bleach and other chlorine products.

Use this Chlorine product	To make a 1:10 solution for disinfecting: -- *Excreta* -- *Cadavers* -- *Spills of infectious body fluids*	To make a 1:100 solution for disinfecting: -- *Gloved hands* -- *Bare hands and skin* -- *Floors* -- *Clothing* -- *Equipment* -- *Bedding*
Household bleach 5% active Chlorine	1 litre bleach per 10litres of water	100 ml per 10 litres of water, or 1 litre of 1:10 bleach solution per 9 litres of water
Calcium hypochlorite powder or granules 70% (HTH)	7 grams or ½ tablespoon per 1 litre of water	7 grams or ½ tablespoon per10 litres of water
Household bleach 30% active Chlorine	16 grams or 1 tablespoon per 1 litre of water	16 grams or 1 tablespoon per10 litres of water

To disinfect clothing:

Promptly and thoroughly disinfect patient's personal articles and immediate environment using one of the following disinfectants:
-- Chlorinated lime powder
-- 1% Chlorine solution
-- 1% to 2% Phenol solution

Promptly and thoroughly disinfect patient's clothing:
-- Wash clothes with soap and water
-- Boil or soak in disinfectant solution
-- Sun dry
-- Wash utensils with boiling water or disinfectant solution
-- Do not wash contaminated articles in rivers or ponds that might be sources of drinking water, or near wells.

ANNEX 6C: Planning an emergency immunization activity

1. Specify the target population for the immunization activity
2. Estimate the necessary amounts of vaccine, diluent and immunization supplies such as sterile syringes and sterile needles, and safety boxes (see the worksheet in Annex 32)
3. Choose the immunization sites and inform the community.
    - Coordinate with the EPI or disease control program in your LGA to identify sites for conducting the immunization activity.
    - Identify the facilities that can participate in the activity
    - Identify a mobile vaccination team if needed.
    - Determine if there are any hard-to-reach areas, e.g. a transient workers' camp. Identify a mobile vaccination team to reach these areas.
    - Contact the facilities and schedule the immunization sites.
    - Contact the National level for vaccine. If a National reserve stock is not available, the national EPI program manager will request an emergency supply from WHO.
    - Make sure there is enough capacity to store extra amounts of the vaccine during storage and transportation to the immunization site.
4. Select vaccinator teams. For every 100 to 150 people expected at the immunization site, the followed staff is required:
    - 1 to 2 Vaccinators to give immunizations
    - 1 recorder to record on immunization cards
    - Volunteers to verify age and vaccination status.
5. Work with you EPI representative to conduct refresher training for Vaccinators on recommended immunization practices. See Annex 33 for recommended immunization practices.
6. Mobilize the community. Inform the public about the emergency immunization activity.
7. Arrange transportation to the immunization site.
    - Plan their transportation to and from the site
    - Schedule vehicles and plan for fuel and other costs
    - Estimate per diem costs and make necessary arrangements for lodging if the site is away from the health worker's usual station.
8. Monitor the number of immunizations given.

ANNEX 6D   Estimating vaccine supplies for immunization activities

Outbreak: _____   *Date confirmed*: _____

Target population: ___ children age 0 up to 5 years
                           ___ children age 9 months up to 14 years
                           ___ children and adults age 0 up to 30 years
                           ___ women of childbearing age - 15 years up to 45 years
                           ___ all adults and children in the general population

1. Calculate the size of the target population. If the activity only targets a proportion of the general population, estimate the size of the target population. Multiply the general population times the percentage of children or adults in the target population. If you do not know the exact age distribution rates in your area, use recommended estimates such as the following:

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

2. Find out how many doses each person should receive. Record the number below as "number of doses recommended".

3. Allow for wastage. Use a wastage factor of 20%. Multiply the size of the target population (see step 1) times the number of doses times 1.20.

   _____ x _____ x 1.20 = _____
   Size of target population   *Number of*   *wastage factor*   *Number of doses*
                            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 label.)

   _____ ÷ _____ = _____
   Total number of   *Doses per vial*   *Total number of vials*
   estimated doses   *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   *Total number of vial*   *Total diluent to order*
per vial

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

8.   Estimate the number of dilution syringes necessary for preparing the vaccine.

Source: *Field Guide for Supplementary Activities Aimed At Achieving Polio Eradication*, World Health Organization, Geneva 1997

LGA guidelines for yellow fever surveillance, Division of Emerging and other communicable disease surveillance and control, World Health Organization, Geneva 1998.

ANNEX 6E   Recommended immunization practices

Work with your immunization agency/department representative to give refresher training to the vaccination teams that will conduct the emergency immunization activity. At a minimum, make sure vaccination teams know how to:

1.   Reconstitute the vaccine correctly:
        --   Determine the appropriate quantity of diluent to reconstitute the freeze-dried vaccine.
        --   Use a sterile syringe and sterile needle.
        --   Draw up and expel the diluent several times in the vial that contains the vaccine.

2.   Wrap the vial in silver foil or cover it with a dark cloth. This will protect the vial from sunlight.

3.   In a field situation, protect the vaccine and diluent from contamination. Cover the open top of the vial with foil to keep out dirt and flies.

4.   Place the vaccine immediately into a cup of ice, or stand it on an ice pack. Keep the ice and vaccines in the shade.

5.   Discard the reconstituted vaccine after six hours or at the end of the session, which ever comes first.

6.   Record the dose on an immunization card for each person immunized, if it is National policy to require vaccinated persons to have a card.

7.   Collect data for monitoring the activity. For example, record the number of doses given on a tally sheet so that coverage from the campaign can be calculated.

8.   Remind health workers about the risk of getting blood-borne diseases from an accidental needle stick. Review safe practices for handling and disposing of sharp instruments and needles.

9.   Arrange for safe disposal of used injection materials at the end of the activity. They can be burned or buried in a pit.

10.   Give instructions for use of injection techniques. Review with health workers the need to plan vaccination campaigns.

11.   Follow National policy for use of opened vials.

ANNEX 6F   Sample messages for community education

Improve hand-washing:

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

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

Message:

ARE YOU PROTECTED FROM DYSENTERY (bloody diarrhoea)?
Washing your hands protects yourself and others from disease.

Always wash:
- after defecation
- after cleaning a child who has defecated
- after disposing of a child's stool
- before and after eating
- before preparing or handling food.

Message:

ARE YOU READY FOR HAND-WASHING?
Do you have?
- Clean water 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:
- Do not eat raw food except undamaged fruits and vegetables that are peeled and eaten immediately.
- Cook food until it is hot throughout
- Eat food while it is still hot or reheat it thoroughly before eating
- Wash and thoroughly dry all cooking and serving utensils after use
- Keep cooked food and clean utensils separate from uncooked foods and potentially contaminated utensils
- Wash hands thoroughly with soap before preparing food
- Protect food from flies by means of fly screens.
- Cook poultry meat and other poultry products properly before eating

Message:

DO YOU PREPARE FOOD SAFELY?

Cooking kills germs
- Thoroughly cook all meats, fish and vegetables
- Eat cooked meats, fish and vegetables while they are hot.

Washing protects from disease
- Wash your hands before preparing or serving food
- Wash your dishes and utensils with soap and water
- Wash your cutting board 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.

Fig---: safe food practice

Safe disposal of human waste

High priority should be given to ensuring the safe disposal of human waste at all times 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 that:

- Everyone should use latrines properly including children
- Transfer children's excreta with a scoop or shovel to the latrine or bury in a hole.
- Avoid defecating on the ground or in or near the water supply.

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

Message:

> *ARE YOU PROTECTED FROM DYSENTERY (bloody Diarrhoea)?*
> *DO YOU USE A TOILET OR LATRINE?*
>
> Germs that cause dysentery live in faeces. Even a person who is healthy might have dysentery germs.
>
> - Always usea 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.

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.

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

1. Covered containers that are cleaned daily and kept away from children and animals. Water should be removed from the containers using a long-handled dipper, kept especially for this purpose.

2. Narrow-mouthed containers with an opening too small to allow the insertion of a hand. Water should be removed by pouring from the opening or by a Spigot.

Water used for bathing, washing and other purposes other than drinking need not be treated and should be stored separately from drinking water.

Safe disposal of bodies

The body fluids of persons who die due to Diarrhoea or a Viral Hemorrhagic fever are still infectious. Use extreme caution when preparing the bodies of suspected Cholera or Viral Hemorrhagic fever patients.

- Hold funerals of persons quickly and close to the place of death
- Discourage washing of dead bodies
- Discourage distribution of food during funerals.

Message:

PERSONAL PROTECTION TO REDUCE EXPOSURE TO MOSQUITOES:

- Use insect repellents

- Use bednets treated with insecticide

- Tuck the lower edge of the bednet under the bedding

ANNEX 6G: Communications under IHR requirements

Introduction

- Following confirmation and verification of the event, the primary health and the LGA level authorities should liaise with the State and or National level authorities to communicate and receive guidance on common positions to be delivered to the media.

- From the first announcement of the outbreak, communication from the LGA level should follow the directions and the key messages developed at the State and or 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 or the State level, media would approach local and LGA public health response level to obtain first hand information from direct sources.

- In addition, the Director of the LGA level hospital should support the communication and provide scientific expertise as evidence for intervention.

Actions at the LGA level

- Identify spokesperson(s) at LGA level (political and technical);
- Liaise regularly with State and or National authorities to provide them with first hand information (received at the community local level, the media, local stakeholders);
- Be in contact regularly with State and or 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 the State and or National level in simple clear key messages;
- Organize press briefings to provide regular information to local media following directions from the State and or National level;
- Develop good relationships with local media to partnership for delivery of accurate, transparent and timely messages to the population;
- Use information materials developed at the State and or 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 the State and or National level.

Actions at the State and National Level

- The State and the National level, where necessary, supports the LGA level in all its activities in order to comply with communication under IHR
- The national level serves as a liaison with WHO for communication under IHR

Section 7
Communicate Information

This section describes how to:

- Prepare an outbreak or event response report
- Inform stakeholders and the population
    - Develop fact sheets
    - Communicate with community leaders and stakeholders
    - Develop and distribute public health bulletins
- Provide feedback to health staff
    - Develop information summary sheets
- Develop LGA newsletters

7.0 Communication

Effective communication is an essential function of surveillance. For example, providing decision makers with summary information about an outbreak response allows them to review how resources were applied to contain the event. Effective communication during an outbreak or a public health event also demonstrates transparency in the management of the event. Ensuring reliable participation of the population in responding to a disease or other public health event relies on provision of information and addressing community concerns.

Feedback consists of communicating with health staff from other levels about the data, results of the analysis of these data and measures that were taken to respond to the potential public health event reported. Feedback aims at reinforcing health workers efforts to participate in the surveillance system.

7.1   Prepare an outbreak or event response report

After an outbreak or event response has taken place, LGA staff that led the investigation should prepare a report. The purpose of the report is to document how the problem was identified, investigated, responded to, what the outcome was, decision taken and recommendations made. Make sure that the health unit that reported the initial cases receives a copy of the report.

See Annex 7A at the end of this section for an example of a recommended format.

7.2   Inform stakeholders and the population

7.2.1 Develop fact sheets

Fact sheets are brief summaries of 1 to 2 pages. They are usually prepared by health staff for consumption by the general public and deal with a single topic or message. For example, a fact sheet on a *Shigella* outbreak in a LGA may contain the following information for the community; the cause of *Shigella,* how it is transmitted, steps for: prevention and updates on the number of cases and deaths. The fact sheets could be posted on a bulletin board or distributed to community groups that are planning health education campaigns.

7.2.2   Communicate with the affected community and stakeholders

Partner coordination is essential during outbreak and event response. Thus establishing routine communication structures and processes between the health and community partners helps to ensure that this vital link is available and functional during an emergency. Options for communicating between the various partners can range from SMS, telephone, hand-carried message, fax, email updates and exchanges of communication materials to more formal decision-making committees. Regardless of the mechanism, ensure that the focus is on transparent and trustworthy communication that takes community experiences into account.

7.2.3 Develop and distribute public health bulletins

In many countries, the national level or region publishes a national public health bulletin on a regular basis. These bulletins have a wider audience than just the health staff in a particular district or health facility. The bulletins are usually brief (2 to 8 pages). They are seen by policy makers, legislators and other decision-makers. The bulletins are valuable channels for reaching technical and donor partners.

The bulletins contain at least:

- A summary table showing the number of reported cases and deaths to date for each priority disease

- A commentary or message on a given disease or topic

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

A sample template for preparing a bulletin is in Annex 7B.

7.3 Provide feedback

In most cases, health facilities and LGAs reliably report surveillance data to the next level as required. But if the facility does not receive information from the next level about how the data were used or what the data meant, health staff may think that their reporting is not important. As a result, future reporting may not be as reliable because health staff will not know if the information they sent to other levels was important or necessary. They will have a good understanding of the health situation at their own level, but they will not have the information they need for characterizing the situation at a LGA or national level.

When the LGA or national managers receive data, they should respond to the health facilities that reported it. The purpose of the feedback is to reinforce health workers efforts to participate in the surveillance system. Another purpose is to raise awareness about certain diseases and any achievements of disease control and prevention projects in the area.

Feedback may be written, such as a monthly newsletter, or it may be given orally through a telephone call or periodic meetings. This section focuses on district level feedback. But the information can also be applied in health facility and national levels.

7.3.1 Develop information summary sheets

An information summary sheet is a report that presents data and its interpretation in a table or other graphic format. For example:

- At a staff meeting, or during a supervisory visit, give a verbal report or comment about the data that were reported by the health facility during a given period of time. Display the data in a simple table. Sit with the health staff and show them the data. Talk together about the likely conclusions that can be drawn. Consider conclusions not only for the health facility, but for the district as a whole.

- Prepare a single sheet with a simple table that shows how the data reported for this period are different from the data reported for some other period or target population. For example, show the number of cases of diarrhoea with dehydration in children less than 5 years of age from the same period last year. Compare them with a corresponding period this year, after a safe water project was implemented in a high-risk area, for example.

- Use the summary sheets to support requests made to higher levels for additional funds, supplies and resources.

7.3.2   Develop LGA newsletters

The purpose of a district newsletter is to provide shorter updates than those provided in a more detailed feedback bulletin.   The LGA newsletter is useful for informing and motivating health staff.

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

Examples of articles that could be carried in a newsletter are:

- Summary of national or LGA data for a given priority disease
- Report of progress towards a specific public health target
- Report of a specific achievement towards public health by an individual health worker or a group of health workers
- Description of special events or activities (for example, a change in market day)

Annexes to Section 7

ANNEX 7A Sample LGA outbreak report
ANNEX 7B Sample Nigeria weekly bulletin
ANNEX 7C Nigeria Bulletin of Epidemiology

ANNEX 7A   Sample district outbreak report

_____

_____ Title/Description (include disease/condition investigated)

_____

_____
            Period   Place (Villages, Neighborhoods, District, Province)

Executive   **summary**:

_____

_____

_____

I. Introduction:
- Background
- Reasons for investigation (public health significance, threshold met, etc.)
- Investigation and outbreak preparedness

II. Methods:
- Dates of investigation
- Site(s) of investigation (health care facilities, villages, other)
- Case finding (indicate what was done regarding case finding, e.g., register review, contact investigation, alerting other health facilities, other)
- Lab specimens collection
- Description of response and intervention (include dates)
- Data management

III. 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
- Lab analysis and results
- With text, describe key features of results of time, place, and person analysis
- For detailed results by time (epi curve), place (map), and person characteristics (tables) and line lists
- Results of response and evidence of impact

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

Outbreak response:

Indicator	Date 1	Date 2	Interval
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	Interval
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?		

V. Evaluation of other aspects of the response:

VI. Interpretations, discussion, and conclusions:

VII. Recommended public health actions:

Comment on following levels: community, health facility, district, partners, provincial, and national

District Epidemic Committee Chairperson:

_____   _____
            Name   Signature

District Medical Officer:

_____   _____
            Name   Signature

Date reported completed: _____

ANNEX 7B   **Sample public health bulletin**
MINISTRY OF HEALTH WEEKLY EPIDEMIOLOGICAL BULLETIN

# Weekly Epidemiology Report

Nigeria Centre for Disease Control (NCDC)
Federal Ministry of Health - Nigeria

Issue: Volume 3 No. 12   **29th March, 2013**

Summary Table (IDSR Weekly Report as at 29/03/2013)

c	Variables	Week 11 2013	Week 12 2013	Week 12 2012	Cumulative Weeks 01 - 12, 2013	Cumulative Weeks 01 - 12, 2012
Polio	WPV Types 1 & 3	4	0	4	9	26
	WPV Types 1	4	0	4	9	19
	WPV Types 3	0	0	0	0	7
Lassa Fever	Cases	35	32	37	524	715
	Deaths	1	1	1	23	75
	CFR	2.86%	3.13%	2.70%	4.39%	10.49%
Cholera	Cases	0	0	13	2	175
	Deaths	0	0	0	1	4
	CFR	0.00%	0.00%	0.00%	50.00%	2.29%
CSM	Cases	62	45	79	563	527
	Deaths	4	2	5	30	35
	CFR	6.45%	4.44%	6.33%	5.33%	6.64%
Measles	Cases	2663	3449	516	18734	3841
	Deaths	9	18	9	130	62
	CFR	0.34%	0.52%	1.74%	0.69%	1.61%
Yellow Fever	Cases	7	11	2	93	33
	Deaths	0	0	0	0	0
	CFR	0.00%	0.00%	0.00%	0.00%	0.00%
Guinea Worm	Cases	0	0	0	0	0
	Deaths	0	0	0	0	0
	CFR	0.00%	45.00%	0.00%	0.00%	0.00%
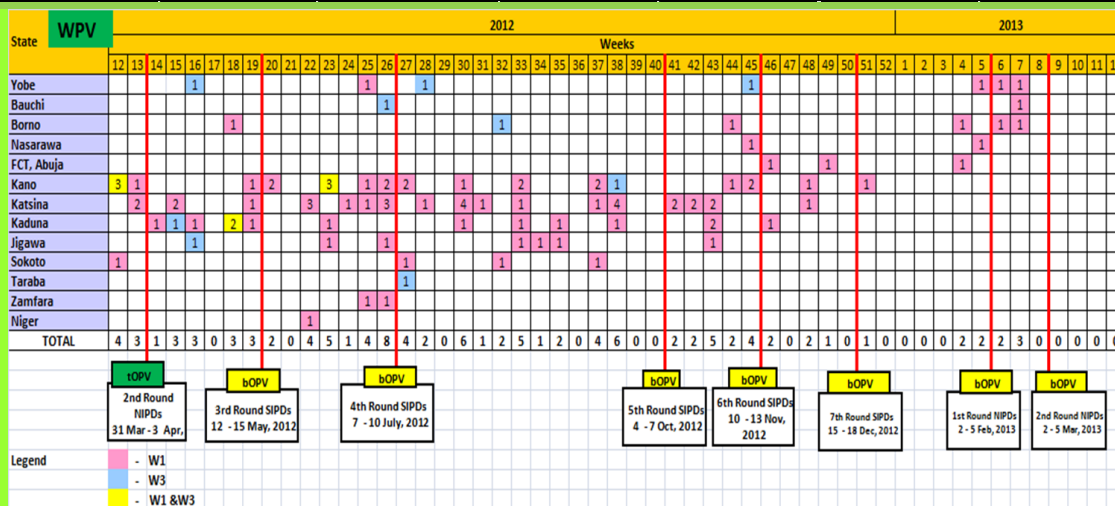
Wild Poliovirus type by week of onset from week 12, 2012-week 12, 2013 as at March 22, 2013

ANNEX 7C   Sample feedback

NIGERIA BULLETIN OF EPIDEMIOLOGY

Nigeria Bulletin Of Epidemiology

Volume 8 Number 1

June 2007

A Publication of Epidemiology Division, Department of Public Health, Federal Ministry of Health , Abuja

Editorial

Emerging and re-emerging infectious diseases like Lassa Fever, Yellow Fever, Ebola Fever and Avian Influenza have caused devastating epidemics in different parts of the world with high morbidity and mortality. Nigeria's health and scarce resources have been overburdened by outbreaks of these diseases.

This issue of the Nigeria Bulletin of Epidemiology focuses on Lassa Fever. Lassa Fever is endemic in Nigeria and other parts of West Africa, with seasonal peaks occurring in the dry season months of December through March.

Hospital associated mortality rate (Nosocomial transmission) in Nigeria could be as high as 60-70%. In the community, the mortality rate is probably as low as 2-5%. Between January and March, 2007, a total of 21 Cases with 10 deaths, Case Fatality Rate - 47.62%, were reported in the country.

Simple barrier nursing practice (Such as wearing protective clothing) when implemented leads to reduced risk of person to person transmission of the disease. Ribavirin, the only known drug for Lassa Fever. Ideally should be given within the first 2 days but still effective up to the 6 days.

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Section 8
Monitor, Evaluate and Improve Surveillance and Response

This section describes how to:

- Identify targets and indicators

- Monitor the quality of surveillance activities at the LGA level

- Supervise surveillance and response activities

- Evaluate the surveillance and response system

- Take action to improve surveillance and response system

8.0 Evaluate and Improve Surveillance and Response

Monitoring of surveillance and response systems refers to the routine and continuous tracking of planned surveillance activities. Periodic evaluation 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 in each month, the health staff responsible for surveillance at the health facility and at the LGA 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
- How well routine prevention and control activities are taking place so that when problems are detected, LGAs 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 LGA?

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.

8.1   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, an LGA may have as its goal the achievement of 100% completeness of reporting by a certain period. An indicator can be developed to measure the proportion or percentage of facilities that are reporting. This proportion is then compared with the desired goal or target, and can be used to evaluate progress and, therefore, the quality of the service or activity.

List the possible indicators to measure the quality of surveillance and response in your LGA. These should be indicators that relate to national goals and indicators, or to specific plans for improving integrated surveillance and response activities in your LGA.

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 and a chart for monitoring core indicators at the health facility are in Annexes 8A and 8B. Core indicators for the LGA level are in Annex 8C and 8D, for the State in Annex 8E and for the national level in 8F.

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 LGA
2.	Proportion of LGAs 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 LGA 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 LGAs 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 LGA level during the last year
12.	Proportion of LGAs that report laboratory data for diseases under surveillance
13.	Proportion of LGA laboratories that received at least one supervisory visit that included written feedback from the State or national level during the last year
14.	Proportion of States reporting monthly analyzed laboratory data to the national reference laboratory

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 LGAs with Public health risks and resources mapped
3.	Proportion of LGAs reporting information using event-based surveillance
4.	Proportion of LGAs provided by national authorities with laws or instruments sufficient for implementation of obligations under IHR
5.	Proportion of LGAs with mechanism for the coordination of relevant sectors in the implementation of IHR established

8.1.1 Select data for measuring the indicators

After you have selected relevant indicators, specify the numerator and the denominator. For example, a LGA 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 LGA 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 LGA.

8.1.2 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	LGA	State	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 LGA and/or State	X	X	X	X
Laboratory reports received	X	X	X	X

8.2   Monitor the quality of the surveillance activities at LGA 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 LGA (or other administrative area) will not be accurate. Outbreaks can go undetected, and other opportunities to respond to public health problems will be missed.

8.2.1 Monitor detection and notification of immediate 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 LGA (within 24 hours) and from the time the threshold is reached to a concrete response (within 48 hours).

8.2.2 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 LGA. 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 National level by 21April i.e., three weeks after the reporting month).

8.2.3 Identify problems and take action

If the monitoring information shows that a health facility or other reporting unit has not provided a report, or if the report is not on time, contact the surveillance focal point at the facility. Work with the designated staff to identify what has caused the problem and develop solutions together (for example, find out if 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 LGA can assist health staff more efficiently with planning responses and carrying them out. For example, if lack of supplies is a problem, the LGA can use the reporting information to advocate with higher levels in the system.

8.2.4 Report timeliness and completeness to other levels

When routine reports of the number of cases are sent to the State, 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.

8.3   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.

8.3.1   Review 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

8.3.2   Prepare a supervision plan

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

- Decide how often to monitor health staff performance. For example, an LGA may decide to conduct a supervisory visit at least quarterly for

each health facility. Depending on resources, supervisory visits may be conducted more regularly.

- Ask health facility supervisors to develop a supervisory schedule from their work-plan 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 LGA surveillance activities such as clinics, medical centres and community reporting sites in the overall plan. Include private health centres, if feasible.

8.3.3   Use a supervisory checklist

Supervision is better conducted using a supervisory checklist, a National IDSR Supervisory checklist is available for this purpose (see Annex 8H).However, each health facility may have unique problems and priorities that require specific solutions and corrections which should be taken into consideration when conducting supervisory visits. Revise the supervisory checklist periodically to ensure that it meets the objectives of the surveillance program.

During the visit, use a checklist to monitor how well health workers are carrying out the recommended surveillance functions. For example, a LGA 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 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	Verify that trend lines are prepared and kept up-to-date for
Analyse data:	priority diseases. Ask to see the "Health Facility Analysis Book," if these are in use in your LGA. 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.

8.3.4   Conduct supervisory visits

Begin regularly scheduled supervision in the LGA to ensure that:

- Appropriate supplies (e.g. forms, job aids) and required standard case definitions/ guidelines are available.

- Health staff display and 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 staff 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 LGA. 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 should meet 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.

8.3.5 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.

8.3.6 Use supervisory visits to improve surveillance activities in the LGA

Visits of surveillance supervisors and regional or State disease control programs are good opportunities to discuss and improve disease control in your LGA. For example, if a national malaria control person visits the LGA, 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.

8.4   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 LGA, select indicators for evaluation that will provide information that relates to the LGA's priorities and objectives for the year.

8.4.1   Compile and organize monitoring data and other results

The *LGA DSNO/M&E* should summarize the surveillance data received from all health facilities in the catchment area, and submit the compiled report to the State 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 *State Epidemiologist/DSNO* should compile the surveillance data received from all LGAs in the State and submit the report to the national level. Submission of the report should not be delayed until the last report is collected. The State should compile and submit the available reports on time. The late reports may be sent separately when they are received.

At the National Level, the *Chief Consultant Epidemiologist* should compile the surveillance data received from all the States. The national level should look for epidemics that were not identified by the LGAs. Follow up with areas where reporting continues to be unreliable or does not happen at all. Support the States in providing assistance to the LGAs when they evaluate the measurements and take action to improve the situation. Provide feedback to each of the levels about the national, State, LGA and health facility levels.

Use a monitoring chart 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.

Collate data from several sources. For example:

- Review the objectives for the year listed in the LGA's annual plan for improving surveillance and response.
- Collate the monthly summaries of cases and deaths reported to the LGA, spot maps, and other analysis results performed by the LGA.
- Collect any results from special surveys or studies that were done in the LGA over the last year.
- Include case investigation forms and reports of outbreak response activities that took place in the LGA.
- Collate summary information from the community and also from health staff.

8.4.2   Analyze results

As you evaluate the summary data for the year, decide:

- Were the reports complete, on time and accurate?
- What were significant changes in disease /events 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 workers requests or suggestions about services or surveillance?
- Were appropriate measures taken to prevent similar events?

8.4.3   Identify problems and their causes

If problems occurred, and the LGA 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 LGA team and health worker to find out the possible causes of the problem.

8.4.4   Prioritise plans for improvements to surveillance and response in next year's plan

Include in the LGA plan for the next year successful activities that should continue. Also include feasible solutions selected as a result of analysis of this year's annual evaluation.

Plan to implement the solution. For example:

1. State the new activity and its objectives
2. Specify the personnel who will carry out the activity
3. Estimate the cost of the activity
4. Develop a timetable for the activity. Define the sequence of activities in logical order

5.   Specify the logistics for the new activity (equipment, personnel, transportation, and resource allocation)

8.4.5   Provide feedback to health facilities about the evaluation

Provide a report and give feedback to health facilities and others in the LGA about the results of the evaluation activity. Mention in the feedback report:

*   What the objectives were for the year
*   What was actually achieved
*   What were likely reasons for any differences between what was planned and what was achieved
*   Recommended solutions and prioritised activities for improving surveillance and response in the LGA.

8.4.6. Evaluate Implementation of IDSR

8.4.6.1. Conduct Monthly Surveillance Review at State and LGA Levels: States and LGAs should conduct monthly surveillance review meeting to share experience, identify gaps and adopt measures to improve the surveillance performance in their levels. State level monthly surveillance review meeting is expected to bring together DNSOs from all the LGAs within a State and State level Disease Control Programme Managers and partners. The LGA level review meeting is expected to bring together surveillance focal points from health facilities within an LGA and LGA Programme Focal Points and partners.

8.4.6.2. Conduct Peer Review: Surveillance peer reviews involve the assessment of state surveillance systems by contemporaries or peers from other states as well as National surveillance team members. This is a global best practice and serves to motivate, build capacity and improve performance in the system. States should conduct the peer review at least bi-annually.

8.4.6.2. Conduct Joint Annual Review: National level should conduct State Epidemiologists meeting annually to review the surveillance and response activities in all the States of the Federation by Government and partners. This is to share experience, identify gaps and adopt measure to improve the system.

8.4.6.3. Conduct National Evaluation A periodic assessment of the implementation of disease surveillance and response in the country will be conducted by the National level. This activity will be conducted in collaboration with WHO and other partners. The assessment of the overall structure and performance of the surveillance activities will lead to result in an agreed plan of action to further improve the system. (See WHO document on Protocol for the Assessment of National Communicable Disease Surveillance and Response system -WHO/CDS/CSR/ISR/2001.2)

Annexes to Section 8

ANNEX 8A   IDSR core indicators for the health facility level

ANNEX 8B   Chart for monitoring performance of IDSR indicators at health facility level

ANNEX 8C   IDSR core indicators for the LGA level

ANNEX 8D   IHR core indicators for monitoring the implementation at LGA level

ANNEX 8E   IDSR core indicators for the State level

ANNEX 8F   IDSR core indicators for the national level

ANNEX 8G   Sample form for recording timeliness and completeness of monthly reporting from the health facility to the LGA level

ANNEX 8H   Checklist for supervising surveillance and response activities at the health facility

ANNEX 8I   Monitoring chart for use of indicators at LGA, regional or State level

ANNEX 8A   Core indicators for the health facility level

Indicator	Purpose	Numerator	Denominator	Source of information	Target
1 Proportion of complete[3] 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[4]	80%
2 Proportion of priority diseases for which a current line graph[5] is available.[6]	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 elimination, eradication and any other disease 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 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 health facility	Routine summary reports and case-based or line listing reports	80%
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

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[3] "Complete" in this indicator means that all possible cells in the reporting forms are filled in.

[4] A chart for monitoring health facility performance is on the next page.

[5] 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.

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

ANNEX 8B: Chart for monitoring performance of IDSR indicators at health facility level

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 LGA level on time. Record on this chart the indicator results. Share this chart with the
LGA supervisor during his or her visit to the health facility, or bring it to the quarterly LGA 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?												

ANNEX 8C: Core indicators for the LGA 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[7]	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 the provincial level within 2 days or surpassing the epidemic threshold	Measures use of data and thresholds for early detection of outbreaks and timely reporting at the local level	Number of suspected outbreaks of epidemic-prone diseases notified to the province within 2 days of surpassing the epidemic threshold	Number of suspected outbreaks of epidemic-prone diseases in the district	Log of suspected outbreaks and rumors District analysis book or other routine analysis tool	80%
4 Proportion of priority diseases for which a current line graph[8] is available.[9]	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	Measures the practice and	Number of health facilities that have	Total number of health facilities in	Supervisory report	80%

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

[8] 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.

[9] "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
facilities that have current trend analysis (line graphs) for selected priority diseases	capacity of the health facility team to analyze surveillance data	current trend analyses for selected priority diseases	the district	Health facility data analysis tools	
6 Proportion of reports of investigated outbreaks that include analyzed case-based data	Measures availability 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 outbreaks of priority diseases	Measures quality of case management	Number of deaths from each of the outbreak diseases	Number of cases from the same outbreak due to that disease	Routine summary report Outbreak investigation report	Will vary; 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

ANNEX 8D   IHR core indicators for monitoring the implementation at LGA 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 LGA	Routine summary reports and supervisory reports	80%
2. Proportion of LGAs with Public health risks and resources mapped	Measures the practice and the Capacity o the LGA to conduct mapping of available resources and health risks	Number of LGAs that reported having conducted Public health risks and resources mapping	C02. Total number of LGAs targeted for public health risks and resources mapping	Risk assessment and mapping reports and supervisory reports	80%
3. Proportion of LGAs reporting information using Event-based surveillance	Measures the practice and the capacity of the LGA submitting surveillance reports using event-based surveillance methods	Number of LGAs reporting information using event-based surveillance methods	C03. Total number of LGAs	Routine summary reports and supervisory reports	80%
4. Proportion of LGAs 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 LGAs reporting having been provided with laws or legal instruments	C04. Total number of LGAs	Routine summary reports and supervisory reports	80%

IHR Indicator	Purpose	Numerator	Denominator	Source of information	Target
5. Proportion of LGAs with mechanism for the coordination of relevant sectors in the implementation of IHR established	Measures the practice and the capacity of the LGA to coordinate IHR implementation	C05. Number of LGAs which established mechanism for the coordination of relevant sectors in the implementation of IHR	C05. Total number of LGAs	Meetings reports and supervisory reports	80%

ANNEX 8E   Core indicators for the State level

Indicator	Purpose	Numerator	Denominator	Source of information	Target
1 Proportion of monthly surveillance reports submitted from the district to the province on time in the last 3 months	Measures the practice of timely submission of surveillance data	Number of districts that submitted IDSR reports on time to the province	Total number of districts that report to the province	Monitoring chart Routine summary reports	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	Number of districts that submitted case-based surveillance reports on time to the province	Routine summary reports and case-based or line listing reports	80%
3 Proportion of suspected outbreaks of epidemic prone disease notified to the provincial 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 province within 2 days of surpassing the alert threshold	Total number of suspected outbreaks of epidemic prone diseases in the province	Log of suspected outbreaks and rumors Routine summary reports	80%
4 Proportion of districts that maintain a current line graph[10] for selected priority diseases.[11]	Measures the practice and capacity to analyze surveillance data	Number of districts for which a current line graph is available	Number of districts	Supervisory reports District analysis book	80%
5 Proportion of reports of investigated outbreaks that includes analyzed case-based data	Measures availability of additional variables for further analysis including possible risk factors involved	Number of district outbreak investigation reports that include epi curve, mapping, personal tables and case-based forms or line lists	Number of district outbreak investigation reports	Investigation reports Routine summary reports	80%
6 Proportion of investigated outbreaks	Measures capacity of the laboratory to confirm the	Number of investigated outbreaks with	Number of investigated outbreaks in	Outbreak investigation reports	80%

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[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 of 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
with laboratory results	diagnosis and involvement of laboratory in the surveillance activities	laboratory results	the province	Laboratory reports Routine summary reports Log of outbreaks and rumours	
7 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%
8 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
9 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 province Outbreak investigation report with line lists or case-based forms	Will vary; depends on disease

ANNEX 8F   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 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	Number of diseases targeted for elimination, eradication and any other disease selected for case-based surveillance	Routine summary reports and case-based or line listing reports	80%
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%
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	Measures availability of	Number of outbreak	Number of outbreaks	Investigation	80%

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[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
Proportion of reports of investigated outbreaks that includes analyzed case-based data	additional variables for further analysis including possible risk factors involved	investigation reports that include epi curve, mapping, personal tables and case-based forms or line lists	investigatation reports	reports Routine summary reports	
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%
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 national level is checking whether districts are observing trends	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
12 Proportion of districts that report laboratory	Measures if districts are collecting and reporting lab data	Number of district labs that submitted monthly data to	Total number of district labs	National log book of reports received	

Indicator	Purpose	Numerator	Denominator	Source of information	Target
data for diseases under surveillance	to higher level	higher level			
13 Proportion of district laboratories that received at least one supervisory visit with written feedback by provincial/national level	Measures the support supervision district labs receive to help to solve problems	Number of district laboratories that received at least one supervision activity	Total number of district laboratories	Reports of the District Lab Focal Person -this may require field visits	
14 Proportion of provincial laboratories reporting analysed lab data to the national lab	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	

ANNEX 8G   **Sample form for recording timeliness and completeness of monthly reporting from the health facility to the LGA**

Country _____   LGA _____   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 LGA so that action can be taken to improve timeliness for each health facility in the LGA.

ANNEX 8H   Checklist for supervising surveillance and response activities at the health facility

Health Facility:_____Date of Supervisory Visit:_____

ACTIVITY	SUPERVISORY QUESTION	ANSWER	COMMENT (What Caused Problem)
Data collection to identify Suspected Cases within health facilities	1. How often do you collect information from the community about reports of suspected cases or deaths due to a priority disease or condition?	_____	
Register cases	1. Are diagnoses of cases of priority diseases recorded in the clinic register according to the standard case definition?	Yes No	
Report	1. Do health staff use a standard case definition to report the suspected cases and outbreaks?	Yes No	
	2. Do you record information about immediately notifiable diseases on a case form or line list?	Yes No	
Analyze and Interpret	1. Do you plot the numbers of cases and deaths for each priority disease on a graph? (Ask to see the health facility's analysis book. Look to see if the trend lines are up-to date.)	Yes No	
	2. Do you plot the distribution of cases on a map?	Yes No	
Investigate and Confirm Reported Cases and Outbreaks	1. If an epidemic-prone disease was suspected, was it reported immediately to the LGA office?	Yes No	
	2. For the cases of priority diseases needing laboratory tests seen since the last supervisory visit, how many had laboratory results?	Number of results obtained:_____ Number of expected cases seen:_____	
	3. Are appropriate supplies available or set aside for collecting laboratory specimens during an urgent situation and show me the supply?	Yes No	

ACTIVITY	SUPERVISORY QUESTION	ANSWER	COMMENT (What Caused Problem)
Respond	1. Are appropriate supplies available for responding to a confirmed case or outbreak *(for example, immunization supplies and vaccine, ORS, antibiotics, and so on)*? 2. Please show me the supplies for carrying out a recommended response. 3. Who is the outbreak coordinator for this facility? 4. How often do you provide information and training in outbreak response to the staff of this facility?	Yes No Yes No Name:_____ Designation:_____ Training is done _____	
Provide Feedback	1. How often do you report information to the community? 2. Do you receive the latest bulletin from the *(central, sub national)* level?	Report it _____	
Evaluate and Improve the System	1. Were the last 3 routine monthly reports sent to the LGA office? 2. Were the last 3 routine monthly reports sent on time?	Yes No Yes No	
Epidemic Preparedness	1. What precautions does the health staff (including laboratory staff) take routinely with all patients regardless of the patients' infection status? 2. How do you estimate the number of supplies to set aside for use during an emergency situation?	Minimum level of standard precautions: _____ How supplies are estimated: _____	

ANNEX 8I   **Monitoring chart for use of indicators at LGA, regional or State level**

LGA: _____ State: _____ 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 LGA													
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 LGA using case-based or line-listing forms													
Proportion of reports of investigated outbreaks that included analyzed case-based data.													
Proportion of LGAs 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 LGA level													
Have you calculated the indicators this month?													
If YES, have you used the results to take action correct any problems?													

Section 9

Summary guidelines for
Specific priority diseases and conditions

This section provides disease specific guidance to:

- Take action to respond to alert and epidemic thresholds for specific diseases
- Identify surveillance goals and objectives for each priority disease
- Identify surveillance data to analyze and interpret for each priority disease
- Prepare to use the LGA analysis workbook

The pages in this section provide summary guidelines for each of the priority diseases targeted for surveillance by WHO/AFRO. This section is intended as a rapid reference only. When further information is required, please use the detailed references listed in the summary. The table below shows how information is organized in this section.

Priority disease or event for integrated disease surveillance

Background
In this section, you will find general information about: ▪ The disease or event, the causative agent, geographic range affected, and other epidemiologic information. ▪ Transmission routes such as person-to-person, unprotected contact with infectious body fluids or contaminated materials, vector-borne, and so on. ▪ Why the disease is a priority disease for surveillance. For example, the disease/event is responsible for a high number of deaths, disability and illness, especially in African countries. ▪ General and specific risk factors in Nigeria. ▪ Any additional background information that might serve the LGA 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 event. *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 events have program specific thresholds for alerting the health facility or LGA 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 lab confirmation, and information on the results of laboratory work.

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

Acute Haemorrhagic Fever Syndrome

Background

Acute Haemorrhagic Fever Syndromes can be attributable to Ebola and Marburg viral diseases (filoviridae); Lassa fever (arenaviridae), Rift Valley fever (RVF) and Crimean-Congo haemorrhagic fever (CCHF) (bunyaviridae); dengue (dengue haemorrhagic fever (DHF)) and yellow fever (flaviviridae); and other viral, bacterial or rickettsial diseases with potential to produce epidemics.

All cases of acute 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

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.

Respond to action threshold

If a single case is confirmed:
- Maintain strict VHF infection control practices throughout the outbreak.
- Mobilize the community for early detection and care and conduct community education about how the disease is transmitted and how to implement infection control in the home care setting 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.

Acute Haemorrhagic Fever Syndrome

Analyze and interpret data

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' by households and work sites.

Laboratory confirmation

Diagnostic test	Presence of IgM antibodies against Ebola, Marburg, CCHF, Lassa or West Nile Fever *or* Presence of Ebola in post-mortem skin necropsy
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 blood 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

- *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 York

Acute Viral Hepatitis

Background

Viral hepatitis A and viral hepatitis E

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

Viral hepatitis B and viral hepatitis C:

- Estimates indicate that worldwide, there are 350 million carriers of hepatitis B virus and 170 million carriers of hepatitis C virus.
- Hepatitis B and C epidemics are uncommon.
- Chronic infection and severe sequelae occur with hepatitis B – an estimated 15% to 25% of chronically infected persons will die prematurely of either cirrhosis or hepatocellular carcinoma. Chronic infection is common in hepatitis C and 5% to 20% of those infected with HCV may develop cirrhosis. There seems to be a connection between HCV infection and hepatocellular carcinoma.
- Hepatitis B is transmitted by percutaneous or permucosal exposure to blood or other infectious body fluids. Major modes of transmission include sexual contact with an infected person, perinatal transmission from mother to infant, shared needles or syringes among injecting drug users, household contact (e.g., communally used razors and toothbrushes) and nosocomial exposure (transfusions, unsafe injection practices). In most countries where HBV is highly endemic, most infections occur during infancy and early childhood.
- Hepatitis C is transmitted by parenteral exposure to blood and plasma derivatives. It is found in highest concentrations in blood. The major causes of HCV infection worldwide are use of unscreened blood transfusions and re-use of needles and syringes that have not been adequately sterilised.
- Prevention and control measures for hepatitis B and C include transfusion safety, safe and appropriate use of injections and vaccination (hepatitis B).
- There is no specific treatment for acute viral hepatitis A, B, C and D.

Surveillance goal

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

Standard case definition

Acute Viral Hepatitis

Suspected case: Any person with acute illness typically including acute jaundice, dark urine, anorexia, malaise, extreme fatigue, and right upper quadrant tenderness. (Note: infected children are often asymptomatic.)

Confirmed case: A suspected case that is laboratory confirmed

Respond to alert threshold

If hepatitis cases are suspected:
- Report case-based information to the appropriate levels.
- As necessary, treat and manage the patient(s) with supportive care.
- Collect specimens and send to laboratory to identify the aetiology of the illness

Respond to action threshold

If hepatitis cases are confirmed
- Determine mode of transmission
- Identify population exposed to risk of infection
- Eliminate common source(s) of infection
- Implement appropriate prevention and control interventions

Analyze and interpret data

Time: Analysis of suspected and confirmed cases by week. Graph cases and deaths weekly. Construct an epidemic curve during outbreaks.

Place: Plot location of case households.

Person: Analyze by age and gender. Assess risk factors to plan and monitor prevention and control measures.

Laboratory confirmation

Diagnostic test	**Hepatitis A:** IgM anti-HAV positive **Hepatitis B:** +ve for Hepatitis B surface antigen (HbsAg) or IgM anti-HBc positive **Hepatitis C:** Anti-HCV positive **Hepatitis D:** HBsAg positive or IgM anti-HBc positive plus anti-HDV positive (only as co-infection or super-infection of hepatitis B) **Hepatitis E:** IgM anti-HEV positive and/or IgG anti-HEV positive
Specimen	Serum

Acute Viral Hepatitis

When to collect the specimen	Specimens should be collected from suspected patient. IgM anti-HAV becomes detectable 5-10 days after exposure. HBsAg can be detected in serum from several weeks before onset of symptoms to days, weeks or months after onset; it persists in chronic infections. IgM anti-HBc positive usually disappears within 6 months.
How to prepare, store and transport the specimen	Use universal precautions to minimize exposure to sharps and any body fluid. Collect 5-10 ml of venous blood. ▪ Let clot retract for 30 to 60 minutes at room temperature or centrifuge to separate serum from red blood cells. ▪ Aseptically pour off serum into sterile, screw capped tubes. ▪ Store serum at 4°C. ▪ For storage >5 days, samples are held at -20°C Transport serum samples using appropriate packaging to prevent breakage or leakage.
Results	Results are usually available within one to 3 days from arrival in the laboratory.

Reference
WHO Recommended Strategies for Prevention and Control of Communicable Diseases; WHO/CDS/CPE/SMT/2001.13   *WHO Recommended Surveillance Standards* WHO/CDS/CSR/ISR/99.2   - WHO Fact Sheet No 328, *Hepatitis A*, revised May 2008.   - WHO Fact Sheet No 204, *Hepatitis B*, revised August 2008   - WHO Fact Sheet No 164, *Hepatitis C*.   - WHO Fact Sheet No 280, *Hepatitis E*, revised January 2005.   - World Health Organization http://www.who.int/topics/hepatitis/en/   - United States, Centers for Disease Control and Prevention http://www.cdc.gov/hepatitis/   *Control of Communicable Diseases Manual*, 18th Edition

Adverse Events Following Immunization (AEFI)

Background

An adverse event is an undesirable outcome observed following immunization without a causality assessment. In some cases these events are caused by the vaccine; in others they are caused by an error in administration of the vaccine; and in the majority of cases there is no relationship. Though adverse events could be mild or serious, only serious events are reported and investigated. It is important to identify real events and determine their cause in order to reassure the public on utilization of immunization services and reduce the risk of further adverse events.

Surveillance goal

To report, investigate and determine the cause of all serious AEFIs and cluster of events and correct it.

Standard case definition

A medical incident that takes place after immunization causes concern and is believed to be caused by the immunization.

It is important to note that "after immunization" (which is a temporal link) does not equal "caused by immunization" (causal link).

Respond to serious AEFI

If a single serious case is detected:

- Treat the patient
- Report the event using reporting form
- Conduct case investigation/complete investigation form
- Communicate with the parents and community
- Respond to rumours or public enquiries

Respond to cluster of events

If a cluster of events is suspected:

- Treat the patients
- Report immediately and line list cases
- Monitor for more clusters
- Initiate investigation of cause." Take remedial action (observe immunization session) to avoid another AEFI occurring from the same cause"

Analyze and interpret data

Determine the cause of the event (causality assessment). Is it programme-related, vaccine-induced, coincidental or unknown? Beware of mass psychological illness if a number of school-aged or older individuals are involved at the same time.

Adverse Events Following Immunization (AEFI)

Reference

- *Surveillance of adverse events following immunization. Field guide for managers of immunization programmes*. WHO/EPI/93.02 Rev 1. http://www.who.int/vaccines-documents/DocsPDF/www9541.pdf

- Kharabsheh S. *Mass psychogenic illness following Td vaccine in Jordan*. Bulletin of the WHO 2001. 79 (8); 764-770. http://www.who.int/bulletin/pdf/2001/issue8/vol79.no.8.764-770.pdf

Anthrax (human)

Background

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

Surveillance goal

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

Standard case definition

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

(e) *Cutaneous form*: Any person with skin lesion evolving over 1 to 6 days from a papular through a vesicular stage, to a depressed black eschar invariably accompanied by oedema that may be mild to extensive

(f) *Gastro-intestinal*: Any person with abdominal distress characterized by nausea, vomiting,

Anthrax (human)

anorexia and followed by fever

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

(h) *Meningeal:* Any person with acute onset of high fever possibly with convulsions, loss of consciousness, meningeal signs and symptoms; commonly noted in all systemic infections, but may present without any other clinical symptoms of anthrax.

AND has an epidemiological link to confirmed or suspected animal cases or contaminated animal products

Confirmed case

A confirmed case of anthrax in a human can be defined as a clinically compatible case of cutaneous, inhalational or gastrointestinal illness that is laboratory-confirmed by:

(c) isolation of *B. anthracis* from an affected tissue or site;
or
(d) Other laboratory evidence of *B. anthracis* infection based on at least two supportive laboratory tests.

Note: it may not be possible to demonstrate *B. anthracis* in clinical specimens if the patient has been treated with antimicrobial agents.

Respond to alert threshold

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

Respond to action threshold

If a single case is confirmed:
- Standard infection control precautions are sufficient and should be used when managing the patients
- Particular attention should be paid to body fluid spills which should be managed by the usual methods for cleaning and decontamination of any body fluid spills. This should be done promptly and thoroughly, because organisms which remain on surfaces may form spores which are infectious
- As is usual practice, personal protective equipment should be used in situations where there is potential for splashes and inoculation injuries. Any incidents should be reported immediately
- Mobilize the community for early detection and care.
- Proper burial or cremation (if practiced) of dead bodies (humans and animals)
- Conduct community education about the confirmed case, how the disease is transmitted, and how to

Anthrax (human)

- 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.

Analyze and interpret data

Time: Graphs of number of suspected / probable / confirmed cases by date.

Place: Map of suspected and confirmed human and animal cases by geographical area (LGA

Person: Table showing the number of suspected / probable / confirmed cases by date, age and sex

Laboratory confirmation

Diagnostic test	Isolation of *Bacillus anthracis* from a clinical specimen (e.g. blood, lesions, discharges)
	Demonstration of *B.anthracis* in a clinical specimen by microscopic examination of stained smears (vesicular fluid, blood, cerebrospinal fluid, pleural fluid, stools)
	Positive serology (ELISA, Western blot, toxin detection, chromatographic assay, fluorescent antibody test)
Specimen	**Cutaneous** 1.For vesicular lesions, two swabs of vesicular fluid from an unopened vesicle 2.For eschars, the edge should be lifted and two swab samples rotated underneath 3.For ulcers, the base of the lesion should be sampled with two saline moistened swabs 4. Blood cultures obtained prior to antimicrobial therapy, if the patient has evidence of systemic symptoms. 5. A full thickness punch biopsy of a papule or vesicle including adjacent skin should be obtained from all patients with a lesion being evaluated for cutaneous anthrax, to be submitted in 10 percent formalin for histopathology. 6.In patients not on antibiotic therapy or on therapy for <24 hours, a second biopsy specimen 7. Acute and convalescent serum samples for serologic testing. **Gastro-intestinal** 1. Blood cultures obtained prior to antimicrobial therapy. 2. Ascites fluid for culture and PCR. 3. Stool or rectal swab for culture and PCR. 4. Oropharyngeal lesion, if present, for culture and PCR. 5. Acute and convalescent serum samples for serologic testing. 6. Autopsy tissues from fatal cases for histopathology. **Inhalation** 1. Blood cultures obtained prior to antimicrobial therapy. 2. Pleural fluid, if present, for culture and PCR.

Anthrax (human)

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

Reference

- WHO. *Anthrax in humans and animals*. World Health Organization, Geneva. (2008) (Available on http://www.who.int/csr/resources/publications/ AnthraxGuidelines2008/en/index.html

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

- *WHO recommended Strategies for the Prevention and Control of Communicable Diseases*, WHO/CDS/CPE/SMT/2001.13

Anthrax (human)

- 2003 WHO *Manual for Laboratory Diagnosis of Anthrax*
  (http://www.searo.who.int/en/Section10/Section17/ Section58/Section909.htm)

- *Anthrax Information for Health Care Providers*, CDC
  (http://emergency.cdc.gov/agent/anthrax/anthrax-hcp-factsheet.asp)

- *Recommended Specimens for Microbiology and Pathology for Diagnosis: Inhalation, Cutaneous, and Gastrointestinal Anthrax*, CDC
  (http://emergency.cdc.gov/agent/anthrax/lab-testing/recommended_specimens.asp)

Buruli ulcer (Mycobacterium ulcerans disease)

Background

- Skin infection caused by *Mycobacterium ulcerans* (an AFB)
- Occurring mainly as skin lesions (nodules, plaques and ulcers) than can be complicated by bone and joint involvement. Involvement of other organs like the eyes is rare
- Spreading in inter-tropical areas, in swampy soils or water body surroundings, forestry or surface mining zones
- Patients are classified into three categories:
  - **Category I**: patient with a single lesion which size is less than 5 cm of diameter (early lesion)
  - **Category II**: patient with single lesion which size is between 5 and 15 cm of diameter
  - **Category III**: patient single lesion which size is over 15 cm of diameter or with multiple lesions or lesion located in critical site (face, head & neck, breast, perineum, genitalia, lesion spanning over joints)
- BU case management has improved greatly through use of WHO recommended antibiotics (rifampicin and streptomycin) in 2004. Surgery is still needed for late cases (category III). Cumulative number of cases is over 60,000 in 2009.
- Mode of transmission is still unknown. *M ulcerans* could penetrate the skin through insect bite (water bugs); micro trauma or small wounds
- Confirmation of diagnosis is done by PCR, AFB search with ZN staining, culture or histology. Specimens of lesions are taken by swab in ulcer, fine needle aspiration (FNA) or biopsy in case of surgery.

Surveillance goal

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

Standard case definition

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

Confirmed case: A suspected case confirmed by at least one laboratory test (ZN for AFB, PCR, culture or histology)

Respond to alert threshold

If a single case is suspected:
▪   Report the suspected case to the appropriate level of the health system

At health facility level:
▪   Take a specimen for laboratory confirmation (Swab or FNA)
▪   Begin wound dressing and combined antibiotic treatment with:
    -- Rifampicin 10 mg/kg daily oral intake for 8 weeks (56 days).
    -- Streptomycin 15mg/Kg daily injection for 8 weeks (56 days)
▪   Refer category III patients to reference hospital/centre
▪   Fill in case report form (BU 01 or BU 02) with origin village GPS data and report to Health District, Regional and National levels
▪   Search other cases in origin village of confirmed case of BU

Respond to action threshold

If a suspected case is confirmed (Not applicable to BU)

Analyze and interpret data

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

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

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

Laboratory Confirmation

Diagnostic test	*Mycobacterium ulcerans:* Smears and biopsy specimens can be sent to the laboratory for confirmation by: ▪ Ziehl-Neelsen stain for acid-fast bacilli ▪ Culture ▪ PCR ▪ Histopathology
Specimen	Smears Biopsy specimens
When to collect the specimen	Specimens should be collected from suspected patient with clinical symptoms (nodule, plaque, ulcer, osteomielite …) Specimen should be collected before any antibiotic is given. Another specimen should be collected at the end of the treatment (in case the treatment is not efficacious or surgery is indicated)

How to prepare, store, and transport the specimen	Collection of specimen: it is important to avoid cross contamination between the collection of samples
	Materials: Dry swabs and recipients.
	Types of specimens: No ulcerative forms, Ulcerative forms, Bone
	Store at 4°C
Results	Buruli ulcer is usually diagnosed clinically and by fininding acid fast bacilli (AFB) in smears from infected ulcers and tissue bipsies. It can also be identified using PCR.
	M ulcerans can be cultured in a refernce lab using the same culture media used to grow *M.tuberculosis.* The organism grows very slowly, usually requiring several weeks to provide visible colonies.
	Diagnostic services are not routinely available. Contact the appropriate National authority or WHO.

References

- Resolution WHA 57.1 on surveillance and control of *Mycobacterium ulcerans disease* (Buruli ulcer). In: 57th World Health Assembly, Geneva, 17-22 May 2004; Resolutions and decisions, annexes. Geneva, WHO; 2004 (WHA57/2004/REC/1: 1-2)

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

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

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

- *District Laboratory Practice in Tropical Countries*, Cambridge

- Ulcere de Buruli, prise en charge de l'infection a *Mycobacterium ulcerans*

Chikungunya

Background

- Chikungunya fever is a viral illness that is spread by the bite of infected mosquitoes. The disease resembles dengue fever, and is characterized by severe, sometimes persistent, joint pain (arthritis), as well as fever and rash. It is rarely life-threatening. Nevertheless widespread occurrence of diseases causes substantial morbidity and economic loss

- The word "Chikungunya" is Makonde for "that which bends up," in reference to the stooped posture of patients afflicted with the severe joint pain associated with the disease. Epidemics of fever, rash and arthritis, resembling Chikungunya fever were recorded as early as 1779. However, the virus was first isolated between 1952-1953 from both man and mosquitoes during an epidemic, in Tanzania.

- Chikungunya fever historically displayed interesting epidemiological profiles in that: major epidemics appeared and disappeared cyclically, usually with an inter-epidemic period of 7-8 years and sometimes as long as 20 years. After a long period of absence, outbreaks appeared in Indonesia in 1999 and have been virtually ongoing since 2004.

Surveillance goal

- Detect Chikungunya sporadic cases and outbreaks promptly, and seek laboratory verification

- Identify high risk areas in order to improve prevention of outbreaks by taking steps to avoid mosquito bites and elimination of breeding sites.

Standard case definition

Suspected case:
   Any person with acute onset of fever >38.5°C and severe arthralgia/arthritis not explained by other medical conditions.

Confirmed case:
   A suspected case with laboratory confirmation.

Respond to alert threshold

If Chikungunya cases are suspected:

- Report case-based information immediately to the next level.
- Collect specimens for confirming the cases
- Conduct an investigation to determine the risk factors for transmission
- Manage and treat the cases using anti-inflammatory agents

Respond to action threshold

Chikungunya

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

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

Analyze and interpret data

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

Place: Plot location of case households with precise mapping.

Person: Report immediate case-based information for cases and deaths. Report summary totals monthly. During outbreak, count cases and deaths weekly. Analyze by age. Assess risk factors to improve prevention of outbreaks.

Laboratory confirmation

Diagnostic test	Serological tests show a rise in antibody titer to Chikungunya virus; the virus may be isolated from the blood of acutely ill patients in newborn mice, mosquitoes or cell culture or detected using IFA or Reverse Transcription Polymerase Chain Reaction (RT-PCR)
Specimen	Serum
When to collect the specimen	Collect specimen from the first suspected case (s). Suspected CHIK cases occur in clusters. Collect representative specimens from suspected cases. If outbreak is confirmed, collect more specimens from cases and also mosquitoes from the affected homes for testing. Type of Specimen - Acute-phase blood (0-10 days after onset) - Convalescent-phase blood (7 - 21 days after onset) Time of collection: When patient presents; collect second sample during convalescence. Between days 7 and 21 after onset.

Chikungunya

How to prepare, store, and transport the specimen	Transport of specimens should comply with the WHO guidelines for the safe transport of infectious substances and diagnostic specimens (WHO, 1997). For ELISA: ▪ Refrigerate at 2º to 8º C serum or clot for testing within 24 hour. If kept for longer store at -80º. For Isolation and RT_PCR ▪ Store at -80º or transport in fully charged dry shipper. Mosquitoes for testing should be transported in fully charged dry shipper. Focus on Aedes species
Results	Diagnostic services for Chikungunya are not routinely available. Contact the appropriate National authority or WHO. ▪ Ministry of Health, Disease Outbreak Management Unit should send samples to WHO reference labs e.g. KEMRI ▪ Preliminary results are ready within 24 hours after samples arrive in the laboratory. Confirmatory results are ready within a week from sample reception.

Reference

- Weekly Epidemiological Record N° 1, 2005, 80, 1-8; http//www.who.int/wer

- World Health Organization http://www.who.int/mediacentre/factsheets/fs327/en/

- United States, Centers for Disease Control http://www.cdc.gov/ncidod/dvbid/chikungunya/

- Sergon et al *Seroprevalence of Chikungunya Virus (CHIKV) Infection on Lamu Island*, Kenya, October 2004. Am J Trop Med Hyg. 2008 Feb;78(2):333-337

- Powers et al. *Evolutionary relationships and systematics of the alphaviruses*. J Virol. 2001 Nov;75(21):10118-31

Cholera

Background

- Acute illness with profuse watery diarrhoea caused by *Vibrio cholerae* serogroups O1 or O139. The disease is transmitted mainly through the faecal-oral route; that is through eating or drinking contaminated food or water.

- Cholera causes over 100 000 deaths per year. It may produce rapidly progressive epidemics or worldwide pandemics. In endemic areas, sporadic cases (less than 5% of all non-outbreak-related diarrhoea cases) and small outbreaks may occur.

- Incubation period is from a few hours to 5 days, usually in the range of from 2 to 3 days.

- There has been a resurgence of cholera in Africa since the mid-1980s, where over 80% of the world's cases occurred in 1999. The majority of cases occurred from January through April.

- Cholera may cause severe dehydration in only a few hours. In untreated patients with severe dehydration, the case fatality rate (CFR) may exceed 50%. If patients present at the health facility and correct treatment is received, the CFR is usually less than 1%. At least 90% of the cases are mild, and they remain undiagnosed.

- Risk factors: eating or drinking contaminated foods such as uncooked seafood or shellfish from estuarine waters, lack of continuous access to safe water and food supplies, attending large gatherings of people including ceremonies such as weddings or funerals, contact with persons who died of cholera.

- Other enteric diarrhoea may cause watery diarrhoea, especially in children less than 5 years of age. Please see *Diarrhoea with dehydration* summary guidelines.

Surveillance goal

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

Standard case definition

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.

Cholera

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 availability of clean drinking water.
- Work with community leaders to limit the number of funerals or other large gatherings for ceremonies or other reasons, especially during an epidemic.
- Reduce sporadic and outbreak-related cases through continuous access to safe water. Promote safe preparation of food (especially seafood, fruits, and vegetables). Promote safe disposal of human waste.

Analyze and interpret data

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

Place: Plot the location of case households.

Person: Count weekly total cases and deaths for sporadic cases and during outbreaks. Analyze 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

Cholera

When to collect the specimen	For each new area affected by the outbreak, a laboratory confirmation should done. Collect stool sample from the first suspected cholera case. If more than one suspected case, collect until specimens have been collected from 5 to 10 cases. Collect stool from patients fitting the case definition and: ▪ Onset within last 5 days, and ▪ Before antibiotics treatment has started *Do not delay treatment of dehydrated patients.* Specimens may be collected after rehydration (ORS or IV therapy) has begun. If possible, specimens should be collected from 5 – 10 suspected cases every 1 – 2 weeks to monitor cessation of the outbreak, changes in serotypes, and antibiotic sensitivity patterns of V.cholerae.
How to prepare, store, and transport the specimen	▪ Place specimen (stool or rectal swab) in a clean, leak proof container and transport to lab within 2 hours. ▪ If more than 2- hour delay is expected, place stool-soaked swab into Cary-Blair transport medium. If Cary-Blair transport medium is not available and specimen will not reach the lab within 2 hours: ▪ Store at 4°C to 8°C ▪ Do not allow specimen to dry. Add small amount of 0.85% NaCl if necessary ▪ To transport, transport in well marked, leak proof container ▪ 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

Dengue Fever

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

Background

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

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

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

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

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

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

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

Surveillance goal

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

Standard case definition

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

Dengue Fever Suspected case: Any person with acute febrile illness of 2-7 days duration with 2 or more of the following: headache, retro-orbital pain, myalgia, arthralgia, rash, haemorrhagic manifestations, leucopenia.

Dengue Fever Confirmed case: A suspected case with laboratory confirmation (positive IgM antibody, rise in IgG antibody titres, positive PCR or viral isolation).

Dengue Haemorrhagic Fever : A probable or confirmed case of dengue with bleeding tendencies as evidenced by one or more of the following: positive tourniquet test; petechieae, ecchymoses or purpura; bleeding: mucosa, gastrointestinal tract, injection sites or other; haematemesis or melaena; and thrombocytopenia (100 000 cells or less per mm3) and evidence of plasma leakage due to increased vascular permeability, manifested by one or more of the following: 20% rise in average haematocrit for age and sex, 20% drop in haematocrit following volume replacement therapy compared to baseline, signs of plasma leakage (pleural effusion, ascites, hypo-proteinaemia).

Dengue Shock Syndrome: All the above criteria, plus evidence of circulatory failure manifested by rapid and weak pulse, and narrow pulse pressure (≤ 20 mm Hg) or hypotension for age, cold, clammy skin and altered mental status.

Respond to alert threshold

If a single case is suspected:

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

Respond to action threshold

If a single case is confirmed:
- Report case-based information immediately to the next level.
- Conduct active search for additional cases
- Collect specimens for confirming the cases
- Survey the community to determine the abundance of vector mosquitoes, identify the most productive larval habitats, promote and implement plans for their elimination, management or treatment with appropriate larvicides.
- Educate the public and promote behaviors to remove, destroy or manage mosquito vector larval habitats.
- Manage and provide supportive treatment to dengue fever cases. Implement standard infection control precautions. Prevent access of mosquitoes to patients by using mosquito bed nets.
- Refer suspected DHF/DSS cases to more advanced facilities.

Analyze and interpret data

Dengue Fever

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

Time:	Graph cases and deaths weekly/monthly. Construct an epidemic curve during the outbreak.
Place:	Plot location of case households and work sites using precise mapping.
Person:	Case-fatality rate. Analyze age and sex distribution. Percentage of DHF / DSS cases and of hospitalizations.

Laboratory confirmation

Diagnostic test	Demonstration of IgM and IgG by Antibody Assays. Detection of viral genomic sequences by PCR. Isolation of the dengue virus using cell culture. Antigen detection Assays for acute phase samples when PCR or isolation is negative. Demonstration of dengue virus antigen in autopsy tissue by immunohistochemistry or immunofluorescence or in serum samples by EIA. *Note: there are several diagnostic techniques available to document an infection by the dengue virus. The IgM ELISA is the basic test for serologic diagnosis.*
Specimen	ELISA: Whole blood, serum or plasma from acute (0-5 days) and convalescent 6 or more days) depending on each case. PCR: Whole blood or blood clot, serum/ plasma or tissue preferably from acute specimens (0-5 days) The samples should be collected for diagnosing a suspected dengue fatality: A blood sample to attempt PCR, virus isolation and serology. If an autopsy is performed, blood from the heart should be collected.
When to collect the specimen	Collect specimen from the first suspected case. If more than one suspected case, collect until specimens have been collected from 5 to10 suspected cases. Type of Specimen ▪ Acute-phase blood (0-5 days after onset of symptoms) ▪ Convalescent-phase blood (≥ 6 days after onset) Time of collection ▪ Collect 2nd sample during convalescence. Between days 6 and 21 after onset. Lab diagnosis of fatal cases is indispensable for understanding the risk factors for severe cases.

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

How to prepare, store, and transport the specimen	Transport of specimens should comply with the WHO guidelines for the safe transport of infectious substances and diagnostic specimens. *For ELISA or PCR:* ▪ Refrigerate serum or clot. For long term storage freeze -20C ▪ Freeze (-20C or colder) tissue specimens for virus isolation If an autopsy has been performed and no fresh tissues are available, tissues fixed in formalin should be submitted for immunohistochemical studies.
Results	**Diagnostic services for Dengue fever and Dengue hemorrhagic fever are not routinely available.** Advance arrangements are usually required for VHF diagnostic services. Contact the appropriate National authority or WHO.
Reference	

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

▪ *Dengue: Clinical and Public Health Aspects,* CDC

Diabetes

Background

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

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

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

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

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

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

- In the African Region, efforts made to create an environment that enhances the fight against diabetes include adoption of resolutions on non communicable diseases in 2000, cardiovascular diseases strategy in 2005, and diabetes mellitus strategy in 2007. The World Health Organization and the International Diabetes Federation (IDF) have also jointly carried out actions to contribute to promoting diabetes awareness in Africa.

Surveillance goal

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

Standard case definition

Suspected new case:
Any person presenting with the following symptoms:
- Increased thirst
- Increased hunger
- Frequent urination

Confirmed new case:
Any person with a fasting venous plasma glucose measurement of ≥ 7 mmol/L (126 mg/dl) or capillary glucose ≥ 6.1 mmol/L (110 mg/dl)
Or
Any person with a non-fasting venous plasma glucose measurement of ≥ 11.1mmol/L (200 mg/dl) or capillary glucose ≥ 11,1 nnik>k (200 mg/dl)

Report only the first lab-confirmed diagnosis of the patient

Diabetes

Recommended public health action

For people with diabetes:
- Treat confirmed cases according to the standardized case management guidelines (WHOPEN).

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

Analyze and interpret data

Time: Graph cases quarterly to analyze trends.

Place: Compare LGA trends with national and regional trends.

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

*Data for non-communicable diseases is analyzed for long term trends

Laboratory confirmation

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

Diabetes

Reference

- *Non communicable Diseases: A strategy for the African Region*, AFR/RC50/10

- *Cardiovascular Diseases in the African Region: Current situation and perspectives*, AFR/RC55/12

- *Diabetes prevention and control: a strategy for the African Region*, AFR/RC57/7

- Steps manual: http://www.who.int/chp/steps/en/

- Gojka R et al, *Global prevalence of diabetes*, Diabetes Care 27(5): 1047–1053, 2004.

- IDF, *Diabetes Atlas,* 2nd Edition, Brussels, International Diabetes Federation, 2003.

- WHO, *Preventing chronic diseases: A vital investment,* Geneva, World Health Organization, 2005.

- WHO, *The burden of mortality attributable to diabetes,* Geneva, World Health Organization, 2004.

- WHO-PEN: Protocols for health promotion, prevention and management of NCDs at primary care level http://www.afro.who.int/en/divisions-a-programmes/ddc/division/2257-who-pen-protocols.html

- *LGA Laboratory Practice in Tropical Countries*, Cambridge

Diarrhoea with blood (Shigella)

Background

- *Shigella dysenteriae* type 1 (SD1*)* is the most common cause of enteric infections and is transmitted from person-to-person through faecal-oral spread.

- Large scale outbreaks may be caused by *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

If you observe that the number of cases or deaths is increasing over a period of time:
- Report the increase to the next level of the health system.
- Treat the suspected cases with oral rehydration and antibiotics based on recent susceptibility results, if available.
- Obtain stool or rectal swab specimen for confirming the SD1 outbreak.
- Investigate the case to determine risk factors contributing to transmission.

Respond to action threshold

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.
When to collect the specimen	For each new area affected by the outbreak, a laboratory confirmation should done. Collect sample when an outbreak is suspected. Collect stool from 5-10 patients who have bloody diarrhoea and: ·Onset within last 4 days, and ·Before antibiotic treatment has started. Preferably, collect stool in a clean, dry container. Do not contaminate with urine. Sample stool with a swab, selecting portions of the specimen with blood or mucus. If stool cannot be collected, obtain a rectal swab sample with a clean, cotton swab.

How to prepare, store, and transport the specimen	Place stool swab or rectal swab in Cary-Blair transport medium. Transport to laboratory refrigerated.
	If Cary-Blair not available, send sample to lab within 2 hours in a clean, dry container with a tight-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.
	Refer to disease specific guidelines in Section 8.0 for additional information about the epidemic potential of *Shigella dysenteriae* 1

Reference

- *Guidelines for the control of epidemics due to Shigella dysenteriae type 1*. WHO/CDR/95.4

- *Safe Water Systems for the Developing World: A Handbook for Implementing Household-based Water Treatment and Safe Storage Projects*. Department of Health & Human Services. Centers for Disease Control and Prevention. Atlanta. 2000

- *Laboratory Methods for the Diagnosis of Epidemic Dysentery and Cholera*. CDC/WHO, 1999 CDC, Atlanta, GA, USA

Diarrhoea with dehydration in children less than 5 years of age

Background

- Diarrhoea with dehydration in children less than 5 years of age is due to infections of the gastrointestinal tract caused by viruses (especially *Rotavirus*), bacteria *(E. Coli, Salmonellae, shigellae, Campylobacter, Yersinia*, and others), and parasites (*Giardia, Entamoeba*, cryptosporidia, and cyclospora). These diseases are transmitted through eating contaminated food or water, or through faecal-oral spread.

- Diarrhoeal diseases represent the second leading cause of death among children less than 5 years of age in many African countries, with more than 3 million deaths per year.

- Different epidemiological patterns (for example, seasonality) are observed for different pathogens.

- The WHO and UNICEF advocate that each LGA team use the Integrated Management of Childhood Illnesses (IMCI) strategy to reduce morbidity and mortality of childhood diarrhoea.

Surveillance goal

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

- Monitor antimicrobial resistance during outbreaks of bacterial origin.

Standard case definition

Suspected case:
Passage of 3 or more loose or watery stools in the past 24 hours with or without dehydration and:

> *Some dehydration* -- two or more of the following signs: restlessness, irritability; sunken eyes; thirsty; skin pinch goes back slowly, or

> *Severe dehydration* -- two or more of the following signs: lethargy or unconsciousness; sunken eyes; not able to drink or drinking poorly; skin pinch goes back very slowly.

Confirmed case:
Suspected case confirmed with stool culture for a known enteric pathogen. *Note:* Laboratory confirmation of specific agent causing outbreak is not routinely recommended for surveillance purposes.

Respond to alert threshold

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

- Report the problem to the next level.

- Investigate the cause for the increased number of cases or deaths and identify the problem.

- Make sure that cases are managed according to IMCI guidelines.

- Encourage home-based therapy with oral rehydration.

-

Diarrhoea with dehydration in children less than 5 years of age

Respond to action threshold

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

- Assess health worker practice of IMCI guidelines for managing cases and improve performance for classifying diarrhoea with dehydration in children less than 5 years of age.

- Teach mothers about home treatment with oral rehydration.

- Conduct community education about boiling and chlorinating water, and safe water storage and preparation of foods.

Analyze and interpret data

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

Place: Plot location of case households.

Person: Report monthly totals due to diarrhoea with some dehydration and also for diarrhoea with severe dehydration from outpatient services. Also report monthly inpatient total cases and deaths due to diarrhoea with severe dehydration.

Laboratory confirmation

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

Reference

- *Management of childhood illness: Clinical skills training course for first level health facilities*. World Health Organization. WHO/CDR/95.14

- *Integrated Management of Childhood Illness: A WHO/UNICEF Initiative Bulletin of the World Health Organization.* Vol. 75, 1997, Supplement 1, 1997. ISBN 92 4 068750 5

Diphtheria

Background	Diphtheria is an infectious disease caused by the bacterium *Corynebacterium diptheriae*. There are two types of diphtheria; one type affects the respiratory tract and the other affects the skin. The most common type affects the tonsils, throat, or nose. Cases of diphtheria most commonly occur among unvaccinated or under-vaccinated persons. Diphtheria may be spread by contact with the secretions from an infected person's nose, throat, skin, eyes and lesions. Rarely, diphtheria may also be spread through contact with articles soiled by the discharge from a lesion. A person with diphtheria is usually contagious for up to 2 weeks, but rarely more than 4 weeks. An infected person should remain in isolation until two lab tests taken 24 hours apart are negative 24 hours after antibiotics are stopped.
Surveillance goal	Surveillance of cases of diphtheria is part of the routine surveillance of vaccine preventable diseases.

Recommended case definition	**Probable Case** Clinical illness[1] in the absence of laboratory confirmation or epidemiological linkage to a laboratory-confirmed case.
	
	Confirmed Case
	
	Clinical illness[1] or systemic manifestations compatible with diphtheria in a person with an upper respiratory tract infection or infection at another site (e.g., wound, cutaneous) **plus** at least one of the following:
	
	Laboratory confirmation of infection:
	
	    ▪ Isolation of Corynebacterium diphtheriae with confirmation of toxin from an appropriate clinical specimen including the exudative membrane **OR**
	
	    ▪ Isolation of other toxigenic corynebacteria (Corynebacterium ulcerans or Corynebacterium pseudotuberculosis) from an appropriate clinical specimen, including the exudative membrane **OR**
	
	    ▪ Histopathologic diagnosis of diphtheria
	
	EPIDEMIOLOGIC link (contact within 2 weeks prior to onset of symptoms) to a laboratory-confirmed case.

Respond to diphtheria outbreak	• Cases of outbreak denotes a low immunization coverage leading to existence of susceptible populations. • Effective case management (prevention of complications by supportive therapy together with antibiotic therapy), and plans to improve routine immunization of eligible populations are the appropriate measures.
Analyze and interpret data	**Time:** Graph cases and deaths monthly. During an outbreak, graph cases and deaths weekly. Construct an epidemic curve during outbreaks **Place:** Plot location of case households with precise mapping **Person:** Report summary totals by age monthly. During outbreak, count cases and deaths by age, weekly

Diphtheria	
Reference	http://www.cdc.gov/vaccines/vpd-vac/diphtheria/default.htm#clinical

Dracunculiasis

Background

- Dracunculiasis is commonly known as Guinea worm disease. It is caused by a large nematode, a disabling parasite that emerges through the skin of the infected person.

- This is an old disease, known since antiquity, leaving many patients with unfortunate socio-economic consequences. It is transmitted through ingestion of water containing a crustacean (cyclops) which is infested by an immature form (larvae) of the nematode. The Cyclops is found in stagnant surface water sources (ponds, traditional shallow wells) in rural areas. The female nematode discharges from the host's skin when there is contact with water. The incubation period is between 9 to 12 months There is no treatment or vaccine against the disease.

- Successful disease control strategies conducted by the endemic countries and an international coalition of partners has pushed Dracunculiasis towards eradication. By December 2008, 4619 cases of Guinea worm were reported to WHO, worldwide, compared to 892 000 that were reported in 1989, showing a reduction of 99.47%.

- In 1989, the disease was endemic in 20 countries, worldwide: Benin, Burkina Faso, Cameroon, Central African Republic, Côte d'Ivoire, Chad Ghana, Ethiopia, India, Pakistan, Kenya, Mali, Mauritania, Niger, Nigeria, Sudan, Senegal, Togo, Uganda and Yemen

- Currently, solely Africa remains affected where 6 countries are still endemic in 2009: Sudan, Ghana, Mali, Ethiopia, Nigeria, and Niger.

Surveillance goal

- Active detection and investigation of each case at the community level. Monthly reporting of cases to the next level.
- In zones where local transmission of the Guinea worm disease has been interrupted, maintain active searches for additional cases or rumors of case.
- Report all imported cases to countries or areas of origin.
- Integrate into surveillance to confirm absence of transmission.

Standard case definition

Suspected case:
- A person presenting a skin lesion with itching or blister living in endemic area of Guinea worm.
- *Confirmed case*: at the last phase of the programme, confirmation of last cases by knowledgeable health staff is required. Follow national guidelines for definition of confirmed case.

Respond to alert threshold

Dracunculiasis

If a single case is suspected:
- Report the case according to national program guidelines for eradication of Dracunculiasis.
- Treat the wound (if any) to decrease disability associated with painful leg lesions.
- Conduct case investigation to confirm risk factors.
- Improve access to safe water according to national guidelines.
-

Analyze and interpret data

Time: Graph cases monthly.

Place: Plot distribution of households and work sites for cases from which cases have been reported.

Person: Count monthly cases, and analyze age distribution. Report monthly to next levels.

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required. Diagnosis is made by visual recognition of the adult worm protruding from a skin lesion (see section 8.0) or by microscopic identification of larvae. Laboratory tests to investigate dracunculiasis are limited because the larvae of *D. medinensis* are normally washed into water. A diagnosis usually made when the blister has ruptured and the anterior end of the female worm can be seen. If required, laboratory confirmation of the diagnosis can be made as follows: place a few drops of water on the ulcer, collect and transfer the water to a slide and examine microscopically for motile larvae.

Reference

- *Dracunculiasis or guinea-worm*, Geneva, World Health Organization, WHO/CDS/CEE/DRA/99.2, 1999 and WHO/WER N°37 September 2003

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

- *LGA Laboratory Practice in Tropical Countries*, Cambridge

Ebola or Marburg viral hemorraghic fevers

Background

- The Ebola and Marburg viruses are both filoviruses.
  - Almost 3,000 cases of Ebola with over 1,900 deaths have been documented since the Ebola virus was discovered in 1976. Major Ebola outbreaks have occurred in Sudan, DRC, Cote d'Ivoire, Gabon, Uganda and Congo.
  - More than 500 cases of Marburg with over 400 deaths were reported during outbreaks of Marburg virus that occurred in DRC (1998-2000), Angola (2004-2005) and Uganda (3 cases in 2007).

- These two viruses are transmitted by direct contact with the blood, secretions, organs or other body fluids of infected persons. The infection of humans with Ebola virus through the handling of infected chimpanzees, gorillas, and forest antelopes (alive and dead) has been documented.

- Ecological studies are in progress to identify the natural reservoirs of both Marburg and Ebola. There is evidence that bats are involved.

- Epidemics can be dramatically amplified in health care facilities with inadequate infection control precautions/barrier nursing procedures.

- Incubation period for Ebola and Marburg is 2 to 21 days.

- Between 20% and 80% of patients have haemorrhagic manifestations depending on the Ebola or Marburg virus strain. Patients become increasingly infectious as their illness progresses.

- High case fatality ratios have been reported during Ebola outbreaks (25% to 90%) and during Marburg outbreaks (25% to 80%)

- There is no specific treatment for either disease. Severe cases require intensive supportive care, as patients are frequently dehydrated and in need of intravenous fluids or oral rehydration with solutions containing electrolytes.

- Close contact with a severely ill patient, during care at home or in hospital, and certain burial practices are common routes of infection. Transmission via contaminated injection equipment or through needle-stick injuries is associated with more severe disease. Infection may also be spread through contact with soiled clothing or bed linens from an infected patient.

Surveillance goals

- Early detection of cases and outbreaks, rapid investigation, and early laboratory verification of the aetiology of all suspected cases.
- Investigation of all suspected cases with contact tracing.
- During epidemics, most infected patients do not show haemorrhagic symptoms and a specific case definition according to the suspected or confirmed disease should be used.

Standard case definition

Ebola or Marburg viral hemorrhagic fevers

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, positive PCR or viral isolation), or epidemiologic link to confirmed cases or outbreak.

Note: During an outbreak, these case definitions may be changed to correspond to the local event.

Respond to alert threshold

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

Respond to action threshold

If a single case is confirmed:
- Maintain strict VHF infection control practices* throughout the outbreak.
- Mobilize the community for early detection and care of cases and conduct community education about how the disease is transmitted and how to implement infection control in the home care setting and during funerals.
- Conduct case contact follow-up and active searches for additional cases that may not come to the health care setting.
- Request additional help from other levels as needed.
- Establish isolation ward to handle additional cases that may come to the health centre.

Analyze and interpret data

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.

Laboratory confirmation

Diagnostic test	Presence of IgM antibodies against Ebola, Marburg, CCHF, Lassa or West Nile Fever *or* Presence of Ebola in post-mortem skin necropsy
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	Collect specimen from the first suspected case. If more than one suspected case, collect until specimens have been collected from 5 to10 suspected cases.

Ebola or Marburg viral hemorraghic fevers

How to prepare, store, and transport	HANDLE AND TRANSPORT SPECIMENS FROM SUSPECTED VHF PATIENTS WITH EXTREME CAUTION. WEAR PROTECTIVE CLOTHING AND USE BARRIER PRECAUTIONS. *For ELISA or PCR:* ▪ Refrigerate serum or clot ▪ Freeze (-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
▪ *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 Fact Sheet No 103, Ebola haemorrhagic fever, revised December 2008* ▪ *WHO Fact Sheet, Marburg haemorrhagic fever, revised July 2008* ▪ *Interim Infection Control Recommendations for Care of Patients with Suspected or Confirmed Filovirus (Ebola, Marburg) Hemorrhagic Fever. BDP/EPR/WHO, Geneva March 2008.* ▪ *WHO recommended Guidelines for Epidemic Preparedness and Response: Ebola Haemorrhagic Fever (EHF). WO/EMC/DIS/97.7.* ▪ *Dengue haemorrhagic fever: diagnosis, treatment, prevention and control. 2nd edition. Geneva: World Health Organization. 1997.*

Foodborne Illnesses

Background

- Foodborne illnesses are caused by a variety of bacterial, viral, parasitic and bacterial or fungal pathogens or their toxins that enter the body through consumption of food or water. In addition to diseases listed elsewhere in this guideline such as cholera, and shigellosis, surveillance for foodborne illnesses may involve other causes such as salmonellosis, hepatitis A or chemical contamination.

- A foodborne illness occurs when two or more people have shared common food or drink followed by an onset of symptoms within a short time period.

- Most people with a foodborne illness do not seek medical care, so cases and outbreaks of foodborne illness usually are neither recognized nor reported.

- The first symptoms often occur in gastrointestinal tract. Nausea, vomiting, abdominal cramps and diarrhoea are frequent symptoms of foodborne diseases.

- Outbreaks may be localized affecting as few as 2 individuals who ate a common meal or product, but large and geographically widespread outbreaks may also occur. Large outbreaks occur when food is contaminated prior to distribution and is widely consumed by many people in many areas.

- Surveillance for foodborne illnesses is needed to monitor food safety and target health promotion actions aimed at food handlers for safer food practices and improved personal hygiene.

Surveillance Goal

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

Standard case definition

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

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

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

Respond to alert threshold

If observed that ≥2 people are ill and have eaten food from a common source:
- Immediately report the illness to the next level of the heath system
- From patients and from the suspected food items and drinks, collect specimens for laboratory confirmation

Foodborne Illnesses

- Treat suspected cases

Respond to action threshold

If an outbreak of a foodborne illness is confirmed:

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

Analyse and interpret data

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

- Place: Plot location of households for cases and deaths

- Person: Count cases and deaths each month. During an outbreak, count outbreak-related cases by week.

- Routinely review clinical data and laboratory results from food and human analyses to identify clusters of cases in time, place or person. Investigate any suspected foodborne outbreaks detected in the data.

- Investigate all suspected outbreaks of foodborne illnesses.

Reference

- Guidelines for Strengthening Foodborne Disease Surveillance in the WHO African Region

- WHO Five Keys to Safer Food at www.who.int/fsf/Documents/5keys-ID-eng.pdf

- WHO Foodborne disease outbreaks: Guidelines for investigation and control
  http://whqlibdoc.who.int/publications/2008/9789241547222_eng.pdf

Human influenza caused by a new subtype

Background

- An influenza pandemic occurs when a new influenza A virus emerges with efficient and sustained human-to-human transmission in populations with limited immunity. Influenza pandemics occurred in 1918, 1957 and 1968. The 1918 pandemic killed an estimated 40–50 million people. It is predicted that a pandemic of equivalent magnitude could kill 62 million people, 96% of them in developing countries.

- Successful containment or control of pandemic influenza is dependent on early recognition of sustained human-to-human transmission. Countries have been encouraged as part of pandemic preparedness planning to enhance surveillance to (i) detect the emergence of new disease; (ii) characterize the disease (epidemiology, clinical manifestations, severity); and (iii) monitor its evolution.

- **Influenza A (H1N1) 2009**: On 11 June 2009, WHO declared a global pandemic due to influenza A (H1N1) 2009 virus and of 8 October 2009, 195 countries, territories and areas had reported cases and/or outbreaks of pandemic (H1N1) virus. The spectrum of disease ranges from non-febrile, mild upper respiratory tract illness to severe or fatal pneumonia.

- **Influenza A (H5N1)**: Another influenza subtype, H5N1 has been circulating among birds for more than 10 years. In 2003, infections in people exposed to sick birds were identified. Since 2003, H5N1 has been confirmed in poultry and/or wild birds in 62 countries and 442 confirmed human H5N1 cases with 262 deaths have been reported from 15 countries. One confirmed death from human infection with A (H5N1) was reported from Nigeria in January 2007. Most patients with H5N1 present with symptoms of fever, cough and shortness of breath and radiological evidence of pneumonia. The large majority of cases for which risk factor data are available indicate that direct contact with live or recently dead poultry is the most important risk factor for human H5N1 infection. However, the continued geographical spread of this highly pathogenic avian influenza virus among birds in Asia, Europe, the Middle East and Africa has heightened concerns about the possibility of a global human pandemic of influenza H5N1.

- Under the IHR (2005), a State Party is required to notify WHO of the first occurrence of human influenza caused by a new subtype, including pandemic (H1N1) 2009 virus.

Surveillance goals

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

Standard case definition

Human influenza caused by a new subtype

Suspected H5N1 case:

Any person presenting with unexplained acute lower respiratory illness with fever (>38 ℃) and cough, shortness of breath or difficulty breathing **AND**
one or more of the following exposures within the 7 days prior to symptom onset:
- *f)* Close contact (within 1 meter) with a person (e.g. caring for, speaking with, or touching) who is a suspected, probable, or confirmed H5N1 case;
- *g)* Exposure (e.g. handling, slaughtering, de-feathering, butchering, preparation for consumption) to poultry or wild birds or their remains or to environments contaminated by their faeces in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month;
- *h)* Consumption of raw or undercooked poultry products in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month;
- *i)* Close contact with a confirmed H5N1 infected animal other than poultry or wild birds;
- *j)* Handling samples (animal or human) suspected of containing H5N1 virus in a laboratory or other setting.

Confirmed H5N1 case: A person meeting the criteria for a suspected case **AND** positive laboratory results from a laboratory whose H5N1 test results are accepted by WHO as confirmatory.

Suspected pandemic (H1N1) 2009 virus infection: An individual presenting with influenza-like-illness (sudden onset of fever > 38 °C and cough or sore throat in the absence of another diagnosis) with a history of exposure to a pandemic (H1N1) 2009 virus.

Confirmed pandemic (H1N1) 2009 virus infection: An individual with a laboratory-confirmed pandemic (H1N1) 2009 virus infection by one or more of the following tests: PCR; viral culture; 4-fold rise in pandemic (H1N1) 2009 virus-specific neutralizing antibodies.

Respond to alert threshold

Respond to a suspected case of human influenza caused by a new subtype or to an unusual event of severe acute respiratory infection:
- Report case-based information immediately to the appropriate levels.
- Implement acute respiratory disease infection control precautions immediately and enhance Standard Precautions throughout the health care setting.
- Treat and manage the patient according to national guidelines.
- Collect laboratory specimens from case-patient and from symptomatic contacts and arrange for laboratory testing[***].
- Review clinical and exposure history during 7 days before disease onset.
- Identify and follow-up close contacts of case-patient.
- Search for additional cases.
- Conduct epidemiological investigation to identify risk factors for infection and populations at risk for severe disease.
- Plan and implement prevention and control measures.

Respond to action threshold

If a single case of human influenza caused by a new subtype is confirmed or if another acute respiratory disease of epidemic or pandemic potential is confirmed:
- Maintain strict acute respiratory disease infection control precautions and establish an isolation ward to manage additional cases who may present for care.
- Treat and manage the patient according to national guidelines.
- Implement active surveillance of case-patient contacts.
- Conduct active searches for additional cases.

Human influenza caused by a new subtype

- Distribute laboratory specimen collection kits to health care facilities.
- Identify high risk populations.
- Mobilize the community to enable rapid case detection and treatment.
- Conduct community education on how influenza is transmitted and on how to implement infection measures in home and community settings.

Analyze and interpret data

Time: Graph weekly cases and deaths, construct an epidemic curve

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

Person: Count weekly total cases and deaths for sporadic cases and during outbreaks. Analyze age and sex distribution. Characterize the illness in terms of clinical presentation, the spectrum of disease, the proportion of cases requiring hospitalization, clinical outcomes, case fatality ratio, attack rates by age/occupation/blood relation.

Laboratory confirmation

Diagnostic test	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 lab required for suspected new subtype) **3) Direct antigen detection (low sensitivity)**
Specimen	A variety of specimens are suitable for the diagnosis: - Throat swab - Nasopharyngeal swab - Nasal swab - Nasopharyngeal aspirate - Intubated patients: tracheal swab or broncholavage fluid - Blood Specimens should be collected in the following order of priority: - Throat swab/Nasopharyngeal aspirate - Acute serum - Convalescent serum
When to collect the specimen	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
How to prepare, store, and transport the specimen	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

Human influenza caused by a new subtype

	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
Results	▪ 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.

References

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▪ *WHO interim guidelines on infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care*, June 2007.

▪ *Collecting, preserving and shipping specimens for the diagnosis of avian influenza A (H5N1) virus infection. Guide for field operations*, October 2006

▪ *WHO Rapid Advice Guidelines on pharmacological management of humans infected with avian influenza A (H5N1) virus*, May 2006.

▪ *WHO interim guidelines on clinical management of humans infected by influenza A(H5N1)*, August 2007.

▪ *WHO guidelines for clinical management of human infection with new influenza A (H1N1) virus: Initial Guidance*, May 2009.

▪ *WHO Guidelines for pharmacological management of pandemic (H1N1) 2009 influenza and other influenza viruses*, 20 August 2009.

▪ *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

Hypertension

Background

- **Hypertension** or **high blood pressure** (HBP) is a chronic condition in which the blood pressure in the arteries is elevated. It is classified as either primary (essential) or secondary. 'Primary' Hypertension is elevated blood pressure where no medical cause is found. 'Secondary' Hypertension is caused by other conditions that affect the arteries, heart, endocrine system or kidneys.

- Hypertension is a major risk factor for cardiovascular diseases such as heart attack or stroke. According to The World Health Report 2001, cardiovascular disease related deaths are increasing in the African Region, and in 2000 accounted for 9.2% of the total deaths in the African Region. Prevalence ranges from 25% to 35% in adults aged 25 to 64 years. Nigeria ………..

- Hypertension affects approximately 1 billion worldwide and it is estimated that more than 20 million people in the African Region are affected. Prevalence of hypertension in Nigeria is about 20%???

- Major risk factors for hypertension are ageing, lack of physical activity, obesity, and a diet high in salt and fat. Other risk factors include; tobacco and alcohol use.

- Lifestyle modifications shown to lower BP include; weight reduction for individuals who are overweight or obese, reducing the amount of fat and salt in the diet, and eating more fresh fruits and vegetables, increased physical activity, and reduction of alcohol and tobacco consumption.

Surveillance goal

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

Standard case definition

Suspected new case at first visit:
Any individual presenting with a resting blood pressure measurement (based on the average of 3 readings) at or above 140 mm Hg for systolic pressure, or greater than or equal to 90 mm Hg for diastolic pressure.

Confirmed case:
Any individual presenting on at least two occasions with a resting blood pressure measurement (based on the average of 3 readings) at or above 140 mm Hg for systolic pressure, or greater than or equal to 90 mm Hg for diastolic pressure.

*** Report only the first diagnostic of the case in the health centre**

Recommended public health action

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

Analyze and interpret data

Time: Graph cases quarterly to analyze trends.

Hypertension

Place: Compare LGA trends with national and regional trends.

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

*Data for non-communicable diseases is often analyzed for long term trends

Laboratory confirmation

Diagnostic is clinical.

Reference

- WHO, *Atlas of heart disease and stroke*, Geneva, World Health Organization, 2004.

- *Non communicable Diseases: A strategy for the African Region*, AFR/RC50/10

- *Cardiovascular Diseases in the African Region: Current situation and perspectives*, AFR/RC55/12
- http://www.who.int/chp/steps/en/

- http://www.afro.who.int/dnc/databases/afro_infobase/index.html

- WHO CVD-risk management package for low-and medium resource settings.

- *The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* U.S. Department of health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute, NIH Publication No. 03-5233, December 2003

- *Handbook of Hypertension*, Vol 20. Editor; C.J. Bulpitt, 2000

- http://www.cdc.gov/bloodpressure/

Influenza-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. Lab-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

A person child or adult with:

- Sudden onset of fever > 38 ℃ 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).

Influenza-like Illness (ILI)

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 unusual 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)

Analyze and interpret data

Time: Graph cases and deaths weekly. Describe changes in the level of respiratory activity 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 its ability to cause human disease or improved its transmissibility. Also use trends of flu remedies and painkillers sales

Influenza-like Illness (ILI)

Laboratory confirmation

Further technical information on the role of laboratory can be found in the WHO guideline on sentinel surveillance of influenza viruses

Reference

- 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/

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  http://www.who.int/csr/resources/publications/influenza/WHO_CDS_EPR_GIP_2006_4/en/index.html

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  http://www.who.int/csr/resources/publications/surveillance/WHO_CDS_EPR_ARO_2006_1/en/index.html

- World Health Organization - Guidelines for the collection of human specimens for laboratory diagnosis of avian influenza infection, 12 January 2005.
  http://www.who.int/csr/disease/avian_influenza/guidelines/humanspecimens/en/

Injuries (Road traffic accidents)

Background

- Injury is a physical damage resulting when the human body is briefly or suddenly subjected to levels of energy exceeding its physiological tolerance or the impairment in function resulting from the lack of one or more vital elements (water, air, warmth) .The energy causing the injury can be mechanical, electrical, thermal, radiant or chemical. Injury is classified as intentional and unintentional.

- All injuries account for 10% of the world's deaths. 5.8 million People die each year as a result of different types of injuries. Of the all systems that people have to deal with on a daily basis; road transport is the most complex and the most dangerous.

- Road traffic accidents result in unintentional injury.

- A traffic collision (motor vehicle collision, motor vehicle accident, car accident, or car crash) occurs when a road vehicle collides with another vehicle, pedestrian, animal, road debris, or other geographical or architectural obstacle. Traffic collisions can result in injury, property damage, and death.

- Worldwide, the number of people killed in road traffic crashes each year is estimated at 1.2 million, while the number of injured could be as high as 50 million.

- Road traffic injuries are a major but neglected global public health problem, requiring concerted efforts for effective and sustainable prevention.

- Road traffic injuries continue to be among the leading causes of death and disability among young people aged between 5 and 44 years and the leading cause of death in the category of people between 15-29 years. The majority of such deaths are currently among "vulnerable road users"-pedestrians, pedal cyclists and motorcyclists.

- Without increased efforts and new initiatives, the total number of road traffic deaths worldwide and injuries is forecast to rise by some 67% by 2020, and in low income and middle-income countries deaths are expected to increase by as much as 83%

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

Surveillance goal

- Estimate and monitor incidence of road traffic injuries and related outcomes
- Identify risk factors and high risk areas to inform prevention policy and programs
- Evaluate programmes aimed at preventing road traffic injuries
- Establish alert thresholds for fatalities to allow health facility personnel review care and services provided to injured persons
- Establish incidence alert thresholds and monitor trends to enable LGA health personnel inform relevant stakeholders

Standard case definition

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

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

Respond to alert threshold

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

Respond to action threshold

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

Analyze and interpret data

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

Time: Graphs to show monthly figures of cases and deaths, curves for the year to depict trends

Place: Plot location of cases and identify high risk areas

Laboratory confirmation

Imaging of the injured person - when required

Reference

- *World Health Report*, 2004, WHO

- WHO- 2010 Status report on Road Safety in Africa, 2010, WHO

- 2004Peden,M.; et al (eds), *World Report on Road Traffic Injury Prevention,* 2004, WHO

- Holder Y., Peden M., Krug E. et al (eds), *Injury Surveillance Guidelines*, 2001, Geneva WHO

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Lassa and Crimean-Congo Haemorrhagic Fevers

Background

- Crimean-Congo haemorrhagic fever (CCHF) belongs to the Bunyaviridae virus family and Lassa fever belongs to the Arenaviridae virus family.

  - CCHF is endemic in Africa and outbreaks have been reported from Uganda, Mauritania, and South Africa. Mauritania reports a few cases each year and South Africa reported 165 laboratory-confirmed cases between 1981 and March 2006.

  - Lassa fever is known to be endemic in Guinea, Liberia, Nigeria and Sierra Leone, but probably exists in other West African countries as well. Some studies indicate that 300,000 to 500,000 Lassa fever cases with 5,000 deaths occur each year in West Africa.

- CCHF spreads to humans either by tick-bites, or through contact with viraemic animal tissue immediately post-slaughter.

- The animal reservoir of the Lassa virus is a rodent of the genus Mastomys. Mastomys infected with Lassa virus do not become ill but shed the virus in their excreta (urine and faeces) and humans usually become infected through aerosol or direct contact with excreta of infected rodents. Lassa fever can also be spread between humans through direct contact with the blood, pharyngeal secretions, urine, faeces or other body secretions of an infected person.

- Person-to-person transmission of both CCHF and Lassa fever has occurred in health care settings after exposure to blood and secretions of infected patients.

- The incubation period for CCHF following a tick bite is usually 1-3 days (max 9 days) and following contact with blood or tissues is usually 5-6 days (max 13 days). The incubation period for Lassa fever ranges from 6-21 days.

- The onset of symptoms among CCHF patients is sudden with fever, myalgia and other signs and symptoms. The reported case fatality ratio for CCHF is between 3% and 30%.

- About 80% of human Lassa fever infections are mild or asymptomatic; the remaining cases have severe multi-system disease. The onset of disease in symptomatic patients is usually gradual starting with fever, general weakness and malaise. Lassa fever is difficult to distinguish from many other diseases, which cause fever, including malaria, shigellosis, typhoid fever, yellow fever and other VHFs. The overall case fatality ratio is 1-15% among hospitalized patients.

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

Surveillance goal

- Early detection of cases and outbreaks, rapid investigation, and early laboratory verification of the aetiology of all suspected cases.
- Investigation of all suspected cases with contact tracing.
- Assess and monitor the spread and progress of epidemics and the effectiveness of control measures.

Lassa and Crimean-Congo Haemorrhagic Fevers

Standard case definitions

Suspected case of CCHF: Illness with sudden onset of fever, malaise, weakness, irritability, headache, severe pain in limbs and loins and marked anorexia. Early development of flush on face and chest and conjunctival infection, haemorrhagic enanthem of soft palate, uvula and pharynx, and often fine petechial rash spreading from the chest and abdomen to the rest of the body, sometimes with large purpuric areas.

Confirmed case of CCHF: A suspected case with laboratory confirmation (positive IgM antibody, PCR, viral isolation or IgG seroconversion by ELISA or IFA) or epidemiologic link to confirmed cases or outbreak.

Suspected case of Lassa Fever: Illness with gradual onset with one or more of the following: malaise, fever, headache, sore throat, cough, nausea, vomiting, diarrhoea, myalgia, chest pain hearing loss and a history of contact with excreta of rodents or with a case of Lassa Fever

Confirmed case of Lassa Fever: A suspected case that is laboratory confirmed (positive IgM antibody, PCR or virus isolation) or epidemiologically linked to a laboratory confirmed case.

Respond to alert threshold

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

Respond to action threshold

If a single case is confirmed:
- Maintain strict VHF infection control practices* throughout the outbreak.
- Mobilize the community for early detection and care and conduct community education about how the disease is transmitted and how to implement infection control in the home care setting. For CCHF, educate the public about the mode of tick transmission and enhance rodent control activities for Lassa fever.
- Conduct active searches for additional cases.
- Request additional help from other levels as needed.
- Establish an isolation ward to handle additional cases that may come to the health centre.

Analyze and interpret data

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.

Laboratory confirmation

Diagnostic test	Presence of IgM antibodies against CCHF, or Lassa Fever

Lassa and Crimean-Congo Haemorrhagic Fevers

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.

References

- *Interim Infection Control Recommendations for Care of Patients with Suspected or Confirmed Filovirus (Ebola, Marburg) Hemorrhagic Fever*. BDP/EPR/WHO, 2008.

- *Infection control for VHF in the African health care setting*, WHO, 1998. WHO/EMC

- Ergonul O. *Crimean-Congo Haemorrhagic Fever*. Lancet Infect Dis 2006;6:203-14.

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

- WHO Fact Sheet No 208, *Crimean-Congo Haemorrhagic Fever*, revised November 2001

- WHO Fact Sheet No 179, *Lassa Fever*, revised April 2005

Leprosy

Background

- Leprosy is a chronic mycobacterial disease of the skin, the peripheral nerves and upper airway mucous membranes. The disease is transmitted mainly through airborne spread from nasal secretions of patients infected by Hansen's bacillus 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.
-
- Leprosy situation in Nigeria???

- 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.

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).

Leprosy

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

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).

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

Lymphatic Filariasis

Background

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

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

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

- Clinical description:
    - Filarial infection may be clinically asymptomatic (even in the presence of laboratory evidence of lymphatic and kidney damage); the disease may also present as one or more acute manifestations (fever, local swellings, tropical pulmonary eosinophilia syndrome, lymphangitis).

- Chronic complications include:
    - Lymphoedema or elephantiasis of the limbs
    - Damage to the genital organs (including hydrocoele in men)
    - Damage to the kidney (including chyluria) and lymphatic system.

Surveillance goal

There are currently 3 options and the choice will depend on the local situation:
1. Routine monthly reporting of aggregated data on probable and confirmed cases from periphery to intermediate level and to central level
2. Sentinel population surveys (standardized and periodical),
3. Active case-finding through surveys of selected groups or through mass surveys. International: Annual reporting from central level to WHO (for a limited number of countries).

Standard case definition

Suspected case:
Resident of an endemic area with a clinical sign of hydrocoele or lymphoedema for which other causes of these findings have been excluded.

Confirmed case:
A person with positive laboratory diagnosis of microfilaremia in blood smear, filarial antigenaemia or positive ultrasound test.

Respond to alert threshold

▪ Confirm community prevalence of infection by surveys

Respond to action threshold

Case management

Hygiene measures for the affected body parts (and, when necessary, antibiotics and antifungal agents) can decrease the risk of adenolymphangitis:
  - Washing the affected parts twice daily with soap and water
  - Raising the affected limb at night
  - Exercising to promote lymph flow
  - Keeping nails short and clean
  - Wearing comfortable footwear
  - Using antiseptic or antibiotic creams to treat small wounds or abrasions, or in severe cases systemic antibiotics.

For the treatment of filarial carriers, the regimen recommended by the country is to be followed:
  - In areas where there is neither Onchocerciasis nor loiasis: DEC 6 mg/kg single dose.
  - In areas where Onchocerciasis has been excluded but not loiasis: individual clinical decision.

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

Areas with concurrent onchocerciasis:
  - 400 mg of albendazole + ivermectin 150 micrograms per kg of body weight once a year for 4-6 years

Areas with no concurrent Onchocerciasis
  - Diethylcarbamazine 6 milligrams per kg of body weight + albendazole 400 mg once a year, or
  - Diethylcarbamazine fortified salt for daily use for at least 6-12 months.

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

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

Analyze and interpret data	
- Map the distribution of Lymphatic Filariasis and identify implementation units that will require mass drug administration - Analyze the drug coverage in implementation units - Assess the decline of parasitological indices microfilaremia before starting MDA and after at least four rounds of MDA till the criteria of less than 1% microfilaraemia in the population and less than 0.1% antigenaemia in school entry children is achieved	

Laboratory confirmation	
Diagnostic test	- Night blood smear - Filarial antigen test
Specimen	Blood smear Blood
When to collect	Night between 10pm and 2am Any time of the day
How to prepare, store, and transport	Spread three drops of blood on a glass slide and spread across the slide to make three lines. After fixing with heat stain with Geimsa stain and examine under microscope Either a rapid ICT card test or by an lab based ELISA test
Results	Positive test is when microfilarieae of W.bancrofti is seen under the microscope Positive if filarial antigen is detected

Reference

- WHO. *Monitoring and epidemiological assessment of the programme to eliminate lymphatic filariasis at implementation unit level* WHO/CDS/CPE/CEE/2005.50

- WHO. *Lymphatic filariasis.* WHO/CDS/CPE/SMT/2001.7

- *WHO. Training module on lymphatic filariasis for drug distributors (in countries where onchoerciasis is not co-endemic).* WHO/CDS/CPE/CEE/2000.10 (Parts 1 &2)

- *WHO. Training module on lymphatic filariasis for drug distributors (in countries where onchoerciasis is co-endemic).* WHO/CDS/CPE/CEE/2000.11 (Parts 1 & 2)

- *WHO. The programme to eliminate lymphatic filariasis – essential elements for medical personnel (in countries where onchoerciasis is not co-endemic).* WHO/CDS/CPE/CEE/2000.12

- *WHO. The programme to eliminate lymphatic filariasis – essential elements for medical personnel (in countries where onchoerciasis is co-endemic).* WHO/CDS/CPE/CEE/2000.13

- WHO. *Preparing and implementing a national plan to eliminate filariasis (in countries where onchoerciasis is not co-endemic).* WHO/CDS/CPE/CEE/2000.15

- WHO. *The programme to eliminate lymphatic filariasis* (in onchoerciasis co-endemic countries). WHO//CDS/CPE/CEE/2000.16 Webpage: www.who.int/lymphatic_filariasis

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

Uncomplicated malaria
Any person living in area at risk of malaria with fever or history of fever within 24 hours; without signs of severe disease (vital organ dysfunction) is diagnosed clinically as malaria.

Confirmed uncomplicated malaria
Any person with fever or history of fever within 24 hours; and with laboratory confirmation of diagnosis by malaria blood film or other diagnostic test for malaria parasites.

Unconfirmed severe malaria
Any patient living in area at rsik of malaria hospitalised with severe febrile disease with accompanying vital organ dysfunction diagnosed clinically

Confirmed Severe malaria

Any patient hospitalized with *P. falciparum* asexual parasitaemia as confirmed by laboratory tests with accompanying symptoms and signs of severe disease (vital organ dysfunction) diagnosed through laboratory.

Respond to alert threshold

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.

Malaria

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 guidelines
How to prepare, store, and transport	*Blood smear:* - Collect blood directly onto correctly cleaned and labeled 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.*

Malaria

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

Malaria Continued…

Note: Setting an epidemic threshold:

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

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

Please note that to ensure early detection and control of malaria epidemics, it is preferable to use weekly surveillance data in Malaria epidemic prone areas.

Source: WHO/AFRO Regional Malaria Program

Malnutrition

Background

- Globally, maternal and child under-nutrition are underlying causes for 3·5 million deaths, including 35% of the disease burden in children younger than 5 years. Of the 40 countries with a child stunting prevalence of 40% or more, 23 are in Africa.

- Severe malnutrition may act as a direct cause of death or an indirect cause by increasing dramatically the number of deaths in children suffering from common childhood illnesses such as diarrhea and pneumonia.

- Despite the above, the burden of child mortality due to severe malnutrition remains largely absent from the international health agenda and few countries, even in high prevalence areas, have specific national policies aimed at addressing it comprehensively.

- The most vulnerable are children under five and pregnant and lactating women. The poor nutritional status and nutritional intake of pregnant women may contribute to newborns with low birth weight (a weight measured immediately after birth). A newborn weighing less than 2500 grams (2.5 kilos or 5.5 pounds) is considered a newborn with low birth weight (LBW). LBW is a major determinant of death, illness and disability in infancy and childhood and also impacts health outcomes in adult life.

- Socio-economic conditions, poor water and sanitation, mothers' nutritional education on how to feed babies and young children, and repeated infections are the main causes of malnutrition.

- Programmes elaborated to eradicate malnutrition are on food security, water and sanitation, promotion of infant and young children feeding practices, micronutrient supplementation programmes, management of severe cases of malnutrition in the communities and in the health facilities, management of infections mainly diarrhoeal disease.

- Many sporadic surveys are being organized, but nutrition surveillance is currently poorly implemented and does not allow for interventions related to prevention and management of malnutrition.

Surveillance goal

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

Standard case definition

Low birth weight newborns:
Any new born with a birth weight less than 2500 grams (or 5.5 lbs)
Malnutrition in children:
- Children under five who are underweight (indicator: weight for age<-2 ZScore)
- Children 6 to 59 months with MUAC<11.5 cm (high risk of mortality)
- Bilateral pitting oedema

Malnutrition in pregnant women:
Pregnant women given birth to low birth weight babies (birth weight < 2.5 Kg) (poor nutritional and health status of the women, can predict which population groups may benefit from improved antenatal care of women and neonatal care for infants).

Malnutrition

Response to alert threshold

If more than 20% of children are underweight:
Programme emphasis on
- Breastfeeding support
- Nutrition education
- Supplementation of child and mother
- Prevention and treatment of diarrhoea
- Prevention and treatment of severe malnutrition
- Socio-economic support

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

If more or equal than 15% of low birth weight are less than 2.5 Kg:
Targeting interventions for improved antenatal care for women and neonatal care of infants including nutritional care (anti-smoking and anti-alcohol campaigns, nutritional care for women before and during antenatal and during lactating period, malaria prophylaxis, new-born care facilities, etc.) to those at risk of poor pregnancy outcomes and treat new born to prevent morbidity and death.

Analyze and interpret data

Time: Graph cases monthly to analyze trends and weekly in emergency

Place: Plot location of households/community with cases

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

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

- Black R.E. et al. *Maternal and Child Undernutrition: global and regional exposures and health consequences.* The Lancet, Volume 371, Issue 9608, Pages 243 – 260.

- Gross R, Webb P, *Wasting time for wasted children: severe child undernutrition must be resolved in non-emergency settings*. Lancet 2006; 367: 1209-1211.

- *Physical status: the use and interpretation of anthropometry*. Report of a WHO Expert Committee.WHO Technical Report Series, 1995, No 854: 81, 128-130, 198-208.

- WHO child growth standards and the identification of severe acute malnutrition in infants and children. A Joint Statement by the World Health Organization and the United Nations Children's Fund

Maternal Deaths

Background

- Deaths during pregnancy, childbirth or termination of pregnancy, and deaths up to 6 weeks (42 days) after childbirth or termination of pregnancy related to pregnancy are considered Maternal Deaths.

- Globally, about 80% of maternal deaths are due to; severe bleeding (mostly bleeding postpartum), infections (also mostly soon after delivery), hypertensive disorders in pregnancy (eclampsia) and obstructed labor. Complications after unsafe abortion cause 13% of maternal deaths.

- Across the developing world, maternal mortality levels remain too high, with more than 500,000 women dying every year as a result of complications during pregnancy and childbirth. About half of these deaths occur in sub-Saharan Africa where a woman's lifetime risk of maternal death is 1 in 22, compared with 1 in 8,000 in industrialized countries.

- Hemorrhage is the leading cause of maternal death in sub-Saharan Africa, and unattended births are a particular risk, especially in rural areas where transport to health care facilities is a problem.

Surveillance goal

- Estimate and monitor maternal mortality rates.
- Identify risk factors and high risk areas for maternal mortality to inform program decisions.
- Evaluate programs aimed at reducing maternal mortality.

Standard case definition

The death of a woman while pregnant or within 42 days of the delivery or termination of the pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

Recommended public health action

- Establish alert thresholds to allow health facility or LGA health personnel determine when special targeted interventions are necessary.
- Monitor trends and respond to alert thresholds
- Increase availability and use of antenatal care
- Provide specialized training to traditional and profession birth attendants
- Support interventions to improve recognition and response to high-risk pregnancies at the community level

Analyze and interpret data
Time: Graph cases to construct an epidemic curve throughout the year in order to identify trends.
Place: Plot the location of cases and analyze the distribution.
Person: Analyze the distribution of cases by age and other demographic factors.
Laboratory confirmation
Routine laboratory confirmation for surveillance is not required.
Reference
▪ WHO Maternal Mortality http://www.who.int/making_pregnancy_safer/topics/maternal_mortality/en/index.html ▪ UNICEF http://www.unicef.org/index.php

Measles

Background

- Measles is a febrile rash illness due to paramyxovirus (*Morbillivirus)* transmitted human-to-human via airborne droplet spread. It is the fourth leading cause of death in children less than 5 years of age in many African countries.

- The incubation period is 7 to 18 days from exposure to onset of fever.

- Among children with vitamin A deficiency and malnutrition, measles may result in severe illness due to the virus itself and associated bacterial infections, especially pneumonia; only the minority of cases are severe.

- Measles is among the most transmissible of human infections. Large outbreaks occur every few years in areas with low vaccine coverage and where there is an accumulation of persons who have never been infected or vaccinated. The true incidence of measles far exceeds reported cases.

- 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

Suspected case:
Any person with fever and maculopapular (non-vesicular) generalized rash and cough, coryza or conjunctivitis (red eyes) or any person in whom a clinician suspects measles.

Confirmed case:
A suspected case with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an outbreak.

Respond to alert threshold

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

Respond to action threshold

If an outbreak is confirmed:
- Improve routine vaccine coverage through the EPI, and lead supplemental vaccination activities in areas of low vaccine coverage.
- Mobilize the community early to enable rapid case detection and treatment.

Analyze and interpret data

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

Place: Plot location of case households.

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

Laboratory confirmation

Diagnostic test	Presence of IgM antibodies to measles virus in serum.
Specimen	Serum Whole blood
When to collect the specimen	Collect specimens between the 3rd day of the rash and 28th day after onset of rash. Collect blood samples on 5 suspected measles cases when the number of cases exceeds the measles outbreak threshold (usually more than 5 cases in a LGA in a month). In countries with an elimination target: - Collect specimen from every suspected case of measles - Collect serum for antibody testing at first opportunity or first visit to the health facility.

How to prepare, store, and 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 4°C to 8°C to prevent bacterial overgrowth (up to 7 days). If not refrigerated, serum stored in a clean tube will be good for at least 3 days.

Reference

- *Using surveillance data and outbreak investigations to strengthen measles immunization programs*, Geneva, World Health Organization. WHO/EPI/GEN/96.02

- *WHO Guidelines for Epidemic Preparedness and Response to Measles Outbreaks* WHO/CDS/CSR/ISR/99.1

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.

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

Meningococcal Meningitis

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

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 LGA as well as any contiguous LGAs 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 LGAs 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
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 (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 drying or shrinkage of the agar slant, the medium should not be used.

Reference

- 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 influenza.* WHO document WHO/CDS/EDC/99.7 WHO, Geneva

Mental, Neurological & substance Use disborders

Surveillance goal

- Early detection and immediate intervention to prevent morbidity and mortality associated with epilepsy
  Register and monitor epilepsy cases

Standard case definition -

Suspected case: Any person with one epileptic seizure

Suspected new case: Report only the first diagnostic of the case in the health centre

 Confirmed case:
Any person with recurrence of, at least, two epileptic seizures. A positive response to treatment with any AED strengthens the hypothesis of a confirmed case. Epileptic seizures can last for 30 seconds to 3 minutes. When they are intricate without a pause, they can lead to *status epilepticus*.

Respond to alert threshold

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

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

Respond to action threshold

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

Analyze and interpret data

Person: Analyse sex and age distribution (by age group from 6 years onwards)

Time: Graph quarterly cases

Place: Plot the distribution by area of residence

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

References:

- WHO, *Epilepsy in the WHO African Region: Bridging the Gap*, WHO Regional Office for Africa, Congo, 2004.

- WHO, *Epilepsy: a manual for medical and clinical officers in Africa*, WHO, Geneva 2002

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

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 LGA.

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

New AIDS Cases

Background

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

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

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

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

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

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

Surveillance goal

New AIDS Cases

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

Standard case definition

WHO/AFRO recommends that countries use either Bangui or Abidjan HIV/AIDSR case definitions. A positive ELISA for confirming HIV and a rapid test for confirming the positive results are sufficient for an epidemiologic case definition for HIV infection.

Public health actions

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

Analyze and interpret data

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

Laboratory confirmation	
Diagnostic test	**Adults and children 18 months or older:** HIV infection is diagnosed based on: - Positive HIV antibody testing (rapid or laboratory- based enzyme immunoassay). This is confirmed by a second HIV antibody test (rapid or laboratory-based enzyme immunoassay) relying on different antigens or of different operating characteristics; AND/OR - Positive virological test for HIV or its components (HIV-RNA or HIV-DNA or ultrasensitive HIV p24 antigen) confirmed by a second virological test obtained from a separate determination **Children younger than 18 months:** HIV infection is diagnosed based on positive virological test for HIV or its components (HIV-RNA or HIV-DNA or ultrasensitive HIV p24 antigen) confirmed by a second virological test obtained from a separate determination taken more than four weeks after birth. Positive HIV antibody testing is not recommended for definitive or confirmatory diagnosis of HIV infection in children until 18 months of age.
Specimen	Serum
When to collect the specimen	Obtain specimens according to national HIV/AIDS program strategy for clinical or epidemiological sampling.
How to prepare, store, and transport the specimen	Use universal precautions to minimize exposure to sharps and any body fluid. *ELISA:* Collect 10 ml of venous blood. ▪ Let clot retract for 30 to 60 minutes at room temperature or centrifuge to separate serum from red blood cells. ▪ Aseptically pour off serum into sterile, screw capped tubes. ▪ Store serum at 4°C. Transport serum samples using appropriate packaging to prevent breakage or leakage.
Results	HIV testing is highly regulated with strict controls on release of information. Results are usually available within one week from arrival in the laboratory.

Reference

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

- WHO Case definitions of HIV for surveillance and revised clinical staging and immunological classification of HIV-Related disease in adults and children.

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

- *Guidelines for Second Generation HIV Surveillance*, WHO and UNAIDS, 2000 WHO/CDC/CSR/EDC/2000.5

- *Consultation on technical and operational recommendations for clinical laboratory testing harmonization and standardization*, Jan 2008, WHO, CDC

Noma

Background

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

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

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

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

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

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

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

- Health workers should recognize risk factors for Noma:

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

Surveillance goal

- Early detection and treatment of cases
- Identification of high risk communities and families
- Estimation of disease incidence and identification of risk factors

Standard case definition

Suspected new case:
> Any child with a mouth ulcer and other warning signs such as; malnutrition, poor hygiene, recent illness from; measles, persistent diarrhoea, or malaria should be regarded as a potential noma case.

Confirmed new case:
> Any person with a gangrenous disease, which starts as gingival ulceration and spreads rapidly through the tissues of the mouth and face, destroying the soft and hard tissues.

Recommended public health action

When a suspected case is detected:

- Treat the case with nationally recommended antibiotic

- Conduct health promotion activities in the community for:
  - Awareness of Noma among the community and in the household
  - Improved environmental sanitation and personal hygiene
  - Separation of livestock from areas where humans live
  - Exclusive breast feeding for the first 6 months of life
  - Improved nutrition and food preparation techniques

- Increase vaccination coverage in the LGA
- Improve sources of drinking water in at-risk communities
- Train public health personnel on early recognition of oral lesions that can lead to Noma.

Analyze and interpret data

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

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

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

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

- Enwonwu, C. (2006). *Noma--the ulcer of extreme poverty*. New England Journal of Medicine, The **354**(3): 221-224

- Enwonwu, C., W. Falkler, et al. (2006). *Noma (cancrum oris)*. The Lancet **368**(9530): 147-156.

- Fieger, A., K. Marck, et al. (2003). *An estimation of the incidence of noma in north-west Nigeria*. Tropical medicine & international health **8**(5): 402-407.

- Enwonwu, C. O. (1995). *Noma: a neglected scourge of children in sub-Saharan Africa*. Bulletin of the World Health Organization **73**(4): 541-545.

- Enwonwu, C. O., W. A. Falkler, et al. (1999). *Pathogenesis of cancrum oris (noma): confounding interactions of malnutrition with infection*. The American journal of tropical medicine and hygiene **60**(2): 223-232.

Onchocerciasis

Background

- Filarial infection of the skin and eye caused by *Onchocerca volvulus* transmitted by the bite of female *Simulium* black flies.

- Nearly all of the world's estimated 18 million infected persons (of whom more than 250 000 are blind) live within 26 African countries. Onchocerciasis is the second leading infectious cause of blindness worldwide. It causes debilitating skin problems, leading to significant decreases in productivity in areas where it is endemic. Entire villages have relocated away from the fertile lands near rivers where black flies breed.

- Incubation period is years to decades since repeated infection is necessary for disease manifestations. Clinical illness is unusual in children even in endemic areas.

- 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

If a suspected case is detected:
- Report the case according to national guidelines
- Collect specimen for confirming the case
- Investigate the case to determine the cause of the case
- Treat the case according to national guidelines.

Respond to action threshold

If a case is confirmed:
- Conduct a migration investigation to identify the origins of infection and initiate control activities.
- Carry out vector control activities according to OCP guidelines.
- Conduct periodic mass treatment with ivermectin in areas with endemic onchocerciasis during the last 10 years.
- Conduct active case finding via population-based surveys and skin snips.

Analyze and interpret data

Time: Graph cases quarterly.

Place: Plot distribution of patients' household and workplaces

Person: Count quarterly cases and analyze age distribution.

Laboratory confirmation

Diagnostic test	Microscopy. Laboratory criteria for confirmation: One or more of the following: - presence of microfilariae in skin snips taken from the iliac crest - presence of adult worms in excised nodules presence of typical ocular manifestations, such as slit-lamp observations of microfilariae in the cornea, the anterior chamber, or the vitreous body
Specimen	Skin snips from: - Nodule fluids - Iliac crests Scapula area
When to collect	Take snips and nodule fluids from suspected cases 1hour after administration of Diethyl carbomazine
How to prepare, store, and transport the specimen	Put the sample in a general container. Add a few drops of normal saline. Close it tightly before transporting it to the laboratory. Transported at ambient temperature.
Results	Result should be ready within 1 day.

Reference

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

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

Pertussis (Whooping Cough)

Background	• Highly contagious, pertussis is an acute disease caused by the bacterium Bordetella pertussis, it is also called Whooping Cough • The disease is known since the 16th century but the organism was first isolated in 1906 • Prior to the availability of the vaccine, pertussis was wide spread and was responsible for a high childhood mortality • The annual incidence has decreased significantly since the widespread use of the vaccine. The annual crude mortality due to pertussis is estimated at more than300,000 deaths • The occurrence of pertussis outbreaks denotes a low immunization coverage.
Surveillance goal	• Surveillance of cases of pertussis is part of the routine surveillance of vaccine preventable diseases. A low incidence of cases of pertussis is an indication of the success of the national immunization services
Recommended case definition	**Suspected case:** • Cough illness lasting at least 2 weeks with either paroxysms of coughing, inspiratory "whoop", or post-tussive vomiting without other apparent cause. **Confirmed case:** • A clinically compatible case that is laboratory-confirmed or epidemiologically linked to a laboratory confirmed case
Respond to pertusis outbreak	• Any confirmed whooping cough outbreak denotes a low immunization coverage leading to existence of susceptible populations. • Effective case management (prevention of complications by supportive therapy together with antibiotherapy), and plans to improve routine immunization of eligible populations are the appropriate measures.
Analyze and interpret data	**Time:** Graph cases and deaths monthly. During an outbreak, graph cases and deaths weekly. Construct an epidemic curve during outbreaks **Place:** Plot location of case households with precise mapping **Person:** Report summary totals by age monthly. During outbreak, count cases and deaths by age, weekly
Reference	*Epidemiology and Prevention of Vaccine Preventable Diseases, CDC, 5th Edition, January 1999*

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.

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.

Plague

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.
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.

Plague

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 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.
Results	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.

Reference

- *Plague Manual: Epidemiology, Distribution, Surveillance and Control/ Manuel de la Peste: Epidémiologie, Répartition, Surveillance et Lutte.* WHO/CDS/CSR/EDC/99.2

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

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

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

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.

Laboratory confirmation

Diagnostic test	Isolation of polio virus from stool
Specimen	Stool *Note: If no specimen is collected, re-evaluate patient after 60 days to confirm clinical diagnosis of polio (AFP).*

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

Reference

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

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

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

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

Rabies (Human)

Background

- Rabies is a zoonotic disease (a disease that is transmitted to humans from animals) that is caused by a virus. Rabies infects domestic and wild animals, and is spread to people through close contact with infected saliva (via bites or scratches).

- The rabies virus infects the central nervous system, causing disease in the brain and, eventually, death. Early symptoms in people include: fever, headache, and general weakness or discomfort. As the disease progresses, symptoms include; insomnia, anxiety, confusion, slight or partial paralysis, 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
- 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

Rabies (Human)

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)

Rabies (Human)

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 Lab for Rabies virus.
Results	The treatment should never await the results of laboratory diagnosis. A laboratory diagnosis may be delayed for a variety of reasons. Results can be obtained from the reference lab within 1-2days.

Reference

- *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.

Rift Valley Fever (RVF)

Background

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

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

- The incubation period of RVF varies from 2 to 6 days. The clinical symptoms include an influenza-like illness, with sudden onset of fever, headache, myalgia and backache. These symptoms usually last from 4 to 7 days. Most of the infected people recover on their own. However a small proportion (about 1%) get complications such as vomiting blood, nose bleeding and passing bloody stool. Other severe types of the disease are eye disease and meningo-encephalitis.

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

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

Surveillance goal

Detect, confirm aetiology and respond to outbreaks promptly of all cases of suspected VHF

Rift Valley Fever (RVF)

Standard case definition

Suspected case:
Early disease :
- Acute febrile illness (axillary temperature >37.5 ℃ or oral temperature of >38.0℃) of more than 48 hours duration that does not respond to antibiotic or antimalarial therapy, and is associated with:
    - Direct contact with sick or dead animal or its products **AND / OR**:
    - Recent travel (during last week) to, or living in an area where, after heavy rains, livestock die or abort, and where RVF virus activity is suspected/confirmed **AND / OR:**
    - Abrupt onset of any 1 or more of the following: exhaustion, backache, muscle pains, headache (often severe), discomfort when exposed to light, and nausea/vomiting **AND / OR**:
    - Nausea/vomiting, diarrhoea OR abdominal pain with 1 or more of the following:
        - Severe pallor (or Hb < 8 gm/dL)
        - Low platelets (thrombocytopenia) as evidence by presence of small skin and mucous membrane haemorrhages (petechiae) (or platelet count < 100x109 / dL)
        - Evidence of kidney failure (edema, reduced urine output) (or creatinine > 150 mol/L) **AND / OR**:
        - Evidence of bleeding into skin, bleeding from puncture wounds, from mucous membranes or nose, from gastrointestinal tract and unnatural bleeding from vagina **AND / OR:**
        - Clinical jaundice (3-fold increase above normal of transaminases)

Late stages of diseases or complications (2-3 weeks after onset
- Patients who have experienced, in the preceding month a flu-like illness, with clinical criteria, who additionally develop the following:
    - CNS manifestations which resemble meningo-encephalitis **AND/OR:**
    - Unexplained visual loss **OR:**
    - Unexplained death following sudden onset of acute flu-like illness with haemorrhage, meningo-ecephalitis, or visual loss during the preceding month.

Confirmed case
Any patient who, after clinical screening, is positive for anti-RVF IgM ELISA antibodies (typically appear from fourth to sixth day after onset of symptoms) or tests positive on Reverse Transcriptase Polymerase Chain Reaction (RT-PCR).

Respond to alert threshold

If a single case is suspected:
- Report case-based information immediately to the appropriate levels.
- Enhance the usual standard precautions throughout the health care setting.
- Treat and manage the patient with supportive care.
- Collect specimen safely to confirm the case.

Rift Valley Fever (RVF)

Respond to action threshold

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

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.

Laboratory confirmation

Diagnostic test	Acute RVF can be diagnosed using several different methods. Serological tests such as ELISA may confirm the presence of specific IgM antibodies to the virus. The virus itself may be detected in blood during the early phase of illness or in post-mortem tissue using a variety of techniques including, antigen detection tests by ELISA, RT-PCR, virus propagation (in cell cultures), Immunohistochemistry in formalin-fixed tissues. ELISA IgG can be used for retrospective diagnostic. Same test can be used for animal diagnosis
Specimen	ELISA (serology) ▪ Whole blood ▪ Serum or plasma ▪ Whole blood or clot ▪ Tissues (fresh frozen) RT-PCR – Virus isolation ▪ Blood ▪ Serum/plasma ▪ Liver biopsy from fatal cases Pathology ▪ Tissue biopsy from fatal cases Identical specimen can be collected from animal

Rift Valley Fever (RVF)

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

Reference

- *WHO/EMC Infection control for VHF in the African health care setting, WHO, 1998.*

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

- Fact sheet N°207 Revised September 2007.

- Infection Control for VHF in the African Health Care Setting /CDC (Annexes 11-12)

Severe Acute Respiratory Infections (SARIs)

Background

- Severe acute respiratory infections (SARIs) are a significant cause of infectious disease morbidity and mortality in Africa. The mortality rates are particularly high among infants, children and the elderly.

- An improved understanding of the epidemiology and seasonality of SARIs in Africa is essential for optimizing public health strategies for their prevention and control (e.g., vaccines and antivirals for prophylaxis and treatment, infection control).

- The threat of SARIs due to novel organisms that have epidemic or pandemic potential warrants special precautions and preparedness. Respiratory disease events that may constitute a public health emergency of international concern1 include severe acute respiratory syndrome (SARS); human influenza caused by a new subtype, including human episodes of avian influenza; pneumonic plague; and novel agents that can cause large-scale SARI outbreaks with high morbidity and mortality.

Surveillance goals

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

Standard case definition

Severe acute respiratory infection (persons ≥ 5 years old)

Any severely ill person presenting with manifestations of acute lower respiratory infection with:
- Sudden onset of fever (>38ºC) AND
- Cough or sore throat AND
- Shortness of breath, or difficulty breathing
- With or without Clinical or radiographic findings of pneumonia

OR
Any person who died of an unexplained respiratory illness.

Respond to a alert threshold

If a single case of an epidemic- or pandemic-prone acute respiratory disease is suspected. OR If there is an unusual event (deaths, outbreak) of severe acute respiratory infection:
- Atypical cases of influenza-like illness (ILI) or severe acute respiratory infection (SARI).
- Two or more persons presenting with a SARI or who died from a SARI are detected with onset of illness in a two-week period and in the same geographical area and/or are epidemiologically linked.

Severe Acute Respiratory Infections (SARIs)

- Health-care workers with only occupational exposure risks develop SARI after providing care to patients with SARI.
- Persons who have contact with birds/animals present with SARI;
- Any rumor of clusters of severe acute respiratory infections or of atypical respiratory infections

Respond to a suspected case of an epidemic- or pandemic-prone acute respiratory disease or to an unusual event of severe acute respiratory infections:

- Report case-based information immediately to the appropriate levels.
- Practice infection control precautions for an acute respiratory disease with epidemic/pandemic potential[4] (e.g., Standard plus Contact plus Droplet Precautions) immediately and enhance Standard Precautions throughout the health care setting.
- Treat and manage the patient according to national guidelines.
- Collect and transport laboratory specimens from case-patient and from symptomatic contacts and arrange for laboratory testing [5,6].
- Review clinical history and exposure history during 7days before disease onset.
- Identify and follow-up close contacts of case-patient.
- Conduct active searches for additional cases.

Analyze and interpret data

Time: Estimate incubation period; describe transmission patterns.

Person: Characterize the illness in terms of clinical presentation, the spectrum of disease, the proportion of cases requiring hospitalization, clinical outcomes, case fatality ratio, attack rates by age/occupation/blood relation.

Place: Describe risk factors, possible exposures. Ascertain whether any evidence exists that the virus may have increased it ability to cause human disease or improved its transmissibility.

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

References

- International Health Regulations, IHR (2005)

- *Technical Guidelines for Integrated Disease Surveillance in the African Region*. WHO - AFRO May 2002

- *WHO guidelines for investigation of human cases of avian influenza A(H5N1)*, January 2007.

- WHO interim guidelines on infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care, June 2007

- WHO guidelines for the collection of human specimens for laboratory diagnosis of avian influenza infection, 12 January 2005

- Collecting, preserving and shipping specimens for the diagnosis of avian influenza A(H5N1) virus infection. Guide for field operations, October 2006.

Severe Acute Respiratory Syndrome (SARS)

Background

- Severe acute respiratory syndrome (SARS) was first recognized as a global threat in 2003 when international spread resulted in 8,098 SARS cases in 26 countries, with 774 deaths.

- Nosocomial transmission of SARS-CoV was a striking feature of the SARS outbreak.

- The majority of the cases were adults. The case fatality ratio of SARS is estimated to range from 0% to more than 50% depending on the age group affected and reporting centre, with a crude global CFR of approximately 9.6%.

- The mean incubation period is 5 days, with the range of 2-10 days. Patients initially develop influenza-like prodromal symptoms including fever, malaise, myalgia, headache and rigors. Cough (initially dry), dyspnoea and diarrhoea may be present in the first week but more commonly reported in the second week of illness. Severe cases develop rapidly progressing respiratory distress. Up to 70% of the patients develop diarrhoea.

- Disease transmission occurs mainly during the second week of illness.

- The SARS coronavirus (SARS-CoV) which causes SARS is believed to be an animal virus that crossed the species barrier to humans recently.

- In the inter-epidemic period, all countries must remain vigilant for the recurrence of SARS and maintain their ability to detect and respond to the possible re-emergence of SARS

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

Surveillance goals

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

Standard case definition

Suspected case of SARS is an individual with:
1. A history of fever, or documented fever ≥ 38 °C **AND**
2. One or more symptoms of lower respiratory tract illness (cough, difficulty breathing, shortness of breath) **AND**
3. Radiographic evidence of lung infiltrates consistent with pneumonia or ARDS or autopsy findings consistent with the pathology of pneumonia or ARDS without an identifiable cause **AND**
4. No alternative diagnosis can fully explain the illness.

Confirmed case of SARS: An individual who tests positive for SARS-CoV infection by the WHO recommended testing procedures.

Severe Acute Respiratory Syndrome (SARS)

Respond to suspected case

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

Respond to alert threshold

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

SARS ALERT:

1) An individual with clinical evidence of SARS **AND** with an epidemiological risk factor for SARS-CoV infection in the 10 days before the onset of symptoms **OR**

2) Two or more health-care workers with clinical evidence of SARS in the same health-care unit and with onset of illness in the same 10-day period **OR**

3 Three or more persons (health-care workers and/or patients and/or visitors) with clinical evidence of SARS with onset of illness in the same 10-day period and epidemiologically linked to a health-care facility.

Analyze and interpret data

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

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

Person: Immediate case-based reporting of cases and deaths. During the outbreak, count and report cases and deaths. Analyze age and sex distribution. Assess risk factors immediately.

Laboratory confirmation

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

How to prepare, store, and transport	- SARS specimens should be handled according to appropriate biosafety practices in order to avoid laboratory-related infections and spread of disease to close contacts. - Clinical samples from patients should be collected by trained personnel. Nasopharyngeal wash/aspirate: have the patient sit with the head tilted slightly backward. Instil 1.5 ml non-bacteriostatic sterile saline (Ph 7.0) into one nostril. Flush a plastic catheter or tubing (e.g. mucus trap tubing) with 2-3 ml of saline. Insert the tubing into the nostril parallel to the palate. Aspirate nasopharyngeal secretions. Repeat for the other nostril. Collect aspirates in sterile vial or mucus trap. Remove tubings and discard in plastic bag. Nasopharyngeal or oropharyngeal swabs: use only sterile Dacron or rayon swab with plastic shafts. Place each swab immediately in a tube containing Virus Transport Media (VTM). Serum collection: Collect 5-10 ml of whole blood in a serum separator tube. Allow blood to clot Respiratory / stool / blood/serum specimens: Refrigerate immediately (4°C). If transport/shipping will be international or will occur > 5 days after collection of last specimen, freeze the specimens at – 20 °C (serum), -20/-70 °C (respiratory specimens) for planned shipping with dry ice if available. Fixed tissues (formalin fixed) from all major organs. Store and ship fixed tissue at room temperature.
Results	Diagnostic services for SARS are not routinely available. Advance arrangements are usually required for SARS diagnostic services. Contact the appropriate National authority or WHO. If there is a high level of suspicion, WHO will support countries to contact a reference laboratory if necessary.

Reference

- *WHO Guidelines for the Global Surveillance of SARS, Updated Recommendations, October 2004*

- *WHO Interim Guidelines, Infection Prevention and Control of Epidemic- and Pandemic-Prone Acute Respiratory Diseases in Health Care, June 2007. WHO/CDS/EPR/2007.6.*

- Use of laboratory methods for SARS diagnosis, WHO

- WHO Biosafety guidelines for handling of SARS specimens

- *A practical Guide for SARS laboratories: from samples collection to shipment*. WHO, 29 Dec 2003.

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

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 LGAs.

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

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

Place: Plot location of case households.

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

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

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

Sexually transmitted infections

Background

- Infections of the human genito-urinary and reproductive systems transmitted via human sexual contact (sexually transmitted disease, STIs). The most common causes of male urethral discharge are a) the gonococcus *Neisseria gonorrhoea* and b) *Chlamydia trachomatis*. The most common causes of male and female genital ulcer are c) syphilis (*Treponema pallidum*), d) herpes simplex virus (HSV1 or 2) and e) chancroid *(Haemophilus ducreyi)*.

- STIs are endemic in most countries of the world, including countries in Africa. Multiple simultaneous STIs are common (for example, gonorrhoea plus *Chlamydia*). STIs may be most highly prevalent in areas where HIV occurs and may facilitate HIV transmission. STIs may be primary or from repeated attacks of urethral discharge.

- STIs are a leading cause of abortion and stillbirth, prematurity, and congenital infections. They may lead to pelvic inflammatory disease (PID), a major cause of decreased fertility.

- Incubation periods for gonorrhoea are 2 to 7 days; *Chlamydia* 7 to 14 days (or longer); syphilis, 10 days to 12 weeks (usually around 3 weeks), and chancroid, 3 to 14 days.

- STIs may be more commonly diagnosed in men, in whom clinical evidence of infection may be more readily apparent.

Surveillance goal

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

Standard case definition

Genital ulcer syndrome (non-vesicular):

Suspected case: Any male with an ulcer on the penis, scrotum, or rectum, with or without inguinal adenopathy, or any female with ulcer on labia, vagina, or rectum, with or without inguinal adenopathy.

Confirmed case: Any suspected case confirmed by a laboratory method.

Urethral discharge syndrome:

Suspected case: Any male with urethral discharge with or without dysuria.

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

Public health action

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

Analyze and interpret data

Time: Graph cases each quarter.

Place: No recommendation for analysis of place.

Person: Count quarterly cases and analyze age distribution.

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

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

Sickle Cell Disorder (SCD)

Background	• Sickle-cell disease or hemoglobinipathy is an autosomic genetic blood disorder that affects the haemoglobin within the red blood cells containing an abnormal form of the oxygen-carrying protein *haemoglobin S*. • Children who inherit sickle-cell genes from both parents (homozygous) will develop sickle-cell disease with clinical presentation, while those who inherit the gene from only one parent (heterozygous) will have the sickle-cell trait with no clinical presentation. • There are different subtypes of haemoglobin S, and other types of abnormal haemoglobin such as *thallasaemia, haemoglobin C and haemoglobin D* which may coexist with *haemoglobin S.* • Recognized since early 20th century, SCD is the more widely observed genetic disease in the world and afflicts particularly Sub-Saharan Africa where the prevalence of the trait varies from 20 to 40 % of the populations; in countries where the trait prevalence is above 20%, the disease affects about 2% of the population. • SCD results in a chronic slow deterioration of multiple organ systems resulting in recurrent episodes of severe pain, anaemia, serious infections and damage to vital organs and complications such as stroke, kidney damage and respiratory problems. It interfers with many aspects of the patient's life, including education, employment and psychosocial development and death. Thus, sickle-cell disease has major social and economic implications for the affected child, the family as well as the community. • Neonatal screening for the sickle-cell trait, when linked to timely diagnostic testing, parental education and comprehensive care, can markedly reduce morbidity and mortality from the disease in infancy and early childhood. Presently, there is no cure for sickle-cell disease and counseling and prevention of causes and infections are simple and very cost effective measures.
Surveillance goal	To provide genetic counseling, prenatal screening, newborn and infant interventions as well as better adulthood clinical management.
Recommended case definition	**Suspected case:** Any person, specially infants and children who present to the health services with typical painful **hand and foot syndrome,** joint pain with or without fever should be suspected of having SCD. Such patients should be examined with care and if no other cause is found Emmel test should be performed in case of known or unknown parental SCD traits. **Confirmed case:** SCD is confirmed if test positive or any Haemoglobin electrophoresis with high Haemoglin S or C percentages. *Note: Report only the first diagnosis of the case (new case) in the health centre*

Sickle Cell Disorder (SCD)	
Recommended Public Health Action	SCD clinical manifestations are always delayed after birth but early diagnostic helps to adapt to local realities in term of new born clinical management. • Intervention strategies based on need assessment are integrated in national integrated prevention and control programmes for non-communicable diseases with focus on prenatal screening and SCD early diagnosis including community-based demonstration projects, health promotion, health services and national SCD programmes development. • Comprehensive policies and strategies adopted by countries in order to strengthen the capability of health systems to deal with SCD, to increase SCD prenatal screening and early diagnosis in order to start clinical management right after birth. • Community based strategies and plans for SCD genetic counseling activities implemented.
Analyze and interpret data	**Time**: Plot cases charts and graphs quarterly **Place**: Map cases by specific geographic area **Person**: Analyse cases by sex and age distribution
References	*Sickle-cell disease is the most prevalent genetic disease in the African Region. In spite of the serious impact it has on children, it is still a neglected disease.* *Cook GC, Zumla AI (eds), Manson's tropical diseases, 21st edition, London, WL Saunders, 2003.* *http://www.medicinenet.com/sickle_cell/article.htm*

Smallpox (Variola)

Background

- Smallpox is an acute contagious disease caused by variola virus, a member of the orthopoxvirus family. Other members of the genus include cowpox, camelpox, and monkeypox. Monkeypox virus has caused the most serious recent human poxvirus infections.

- Smallpox killed as many as 30% of those infected. In 1967, when WHO launched an intensified plan to eradicate smallpox, the disease threatened 60% of the world's population and killed every fourth patient.

- The global eradication of smallpox was certified by a commission of eminent scientists in December 1979 and subsequently endorsed by the World Health Assembly in 1980.

- Smallpox had two main forms: variola major and variola minor. The disease followed a milder course in variola minor, which had a case-fatality rate of less than 1 per cent. The fatality rate of variola major was around 30%. There are two rare forms of smallpox: haemorrhagic and malignant. In the former, invariably fatal, the rash was accompanied by haemorrhage into the mucous membranes and the skin. Malignant smallpox was characterized by lesions that did not develop to the pustular stage but remained soft and flat. It was almost invariably fatal.

- The incubation period of smallpox is usually 12–14 days (range 7–17) during which there is no evidence of viral shedding. During this period, the person looks and feels healthy and cannot infect others.

- The incubation period is followed by the sudden onset of influenza-like symptoms. Two to three days later, the temperature falls and the patient feels somewhat better, at which time the characteristic rash appears, first on the face, hands and forearms and then after a few days progressing to the trunk. Lesions also develop in the mucous membranes of the nose and mouth, and ulcerate very soon after their formation, releasing large amounts of virus into the mouth and throat. The centrifugal distribution of lesions, more prominent on the face and extremities than on the trunk, is a distinctive diagnostic feature of smallpox and gives the trained eye cause to suspect the disease. Lesions progress from macules to papules to vesicles to pustules. All lesions in a given area progress together through these stages. From 8 to 14 days after the onset of symptoms, the pustules form scabs which leave depressed depigmented scars upon healing.

- Varicella (chickenpox) can be distinguished from smallpox by its much more superficial lesions, their presence more on the trunk than on the face and extremities, and by the development of successive crops of lesions in the same area.

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

- The frequency of infection is highest after face-to-face contact with a patient after fever has begun and during the first week of rash, when the virus is released via the respiratory tract.

- In the absence of immunity induced by vaccination, humans appear to be universally susceptible to infection with the smallpox virus.

- Vaccine administered up to 4 days after exposure to the virus, and before the rash appears, provides protective immunity and can prevent infection or ameliorate the severity of the disease.

- Immediate Notification to WHO is formally required by IHR (2005).

Smallpox (Variola)

Surveillance goal

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

Standard case definition

Suspected case: An illness with acute onset of fever $\geq 38.3\,^{\circ}$C ($101\,^{\circ}$F) followed by a rash characterized by vesicles or firm pustules in the same stage of development without other apparent cause.

Probable case: A case that meets the clinical case definition, is not laboratory confirmed, but has an epidemiological link to a confirmed or probable case.

Confirmed case: A clinically compatible case that is laboratory confirmed.

Respond to alert threshold

If a single case is suspected:
- Report case-based information immediately to the appropriate levels.
- Implement airborne infection control precautions.
- Treat and manage the patient with supportive care.
- Collect specimen safely to confirm the case.
- Implement contact tracing and contact management.
- Conduct active surveillance to identify additional cases.
- Notify WHO.

Respond to action threshold

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

Analyze and interpret data

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

Place: Map location of case households.

Person: Immediate case-based reporting of cases and deaths. During the outbreak, count and report cases and deaths. Analyze age and sex distribution. Assess risk factors immediately.

Smallpox (Variola)

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

Smallpox (Variola)

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

Reference
▪ WHO Fact Sheet, Smallpox. http://www.who.int/mediacentre/factsheets/smallpox

	Snake bite
Background	Snake bite is a neglected public health issue in many tropical and subtropical countries. About 5 million snake bites occur each year, resulting in up to 2.5 million envenomings (poisoning from snake bites) 1, at least 100 000 2,3 deaths and around three times as many amputations and other permanent disabilities.1 Most of these occur in Africa, Asia and Latin America. 2 In Africa alone there are an estimated 1 million snake bites annually with about half needing treatment. Snakebite is a wound resulting from penetration of the flesh by the fangs or teeth of a snake. Bites by snakes known to be nonvenomous are treated as puncture wounds; those produced by an unidentified or poisonous snake require immediate attention and are assumed to be venomous. **Disease agent:** venom **Main modes of transmission:** bite by snake found in the environment – farm, home, streets, schools, office etc. **Clinical description:** history of bite and/or presence of wound resulting from penetration of the flesh by fangs or teeth of a snake.
Surveillance goal	Collect epidemiologic data for: ▪ Government to produce, regulate and distribute antivenoms ▪ Health care professionals in treating snakebites; ▪ Determine where to priorities general population education to know and identify venomous snakes that live in their area
Recommended case definitions	• *Suspected:* Not applicable • *Confirmed:* A person with visibly bitten by a snake and/or injury from snakebite **Diagnosis** History of a snakebite or suspected snake bite. Occasionally the diagnosis is not obvious if a snake is not seen or the patient presents with coagulopathy or neurotoxicity and no history of a bite. A careful history is required to determine the circumstances of the bite and what first aid has been applied. Early symptoms suggest severe envenoming. The examination should include the bite site, and palpation of the lymph nodes draining the site for tenderness. In addition to standard observations, the examination includes looking for signs of paralysis (ptosis, bulbar palsy, respiratory effort and peripheral weakness), any evidence of coagulopathy (bleeding) or evidence of rhabdomyolysis (muscle tenderness and weakness). **Investigations** - full blood count, coagulation studies and biochemical tests including creatine kinase. A urine analysis is helpful for detecting blood or myoglobin. A whole blood clotting time may be useful if coagulation studies are not available - The normal clotting time is less than 10 minutes. Clotting time greater than 20 minutes, is highly suggestive of procoagulant coagulopathy. If the clotting time is between 10 and 20 minutes, the result is indeterminate, but may be consistent with an anticoagulant coagulopathy.

Recommended public health action	**Management of snake bite** Many snakebites do not result in envenoming, depending on the species of snake. This means all suspected snake bites must be triaged as a medical emergency and observed for a sufficient period of time in a hospital with adequate supplies of antivenom and laboratory facilities. The bite site should not be washed so that the area can be swabbed for venom detection. Pressure immobilization is the recommended first aid treatment with a broad (15 cm) bandage is applied and the patient remain completely immobilized, not just the bitten limb. Pressure immobilization should only be removed once the patient is in a hospital stocked with antivenom. If the patient has no clinical or laboratory signs of envenoming, the bandage can be removed if antivenom and resuscitation equipment are available. *General management* Initial management includes basic resuscitation and assessment of the patient. Once airway, breathing and circulation have been assessed and stabilized, the diagnosis can be made and specific management undertaken. All cases of suspected snakebite should be observed for sufficient time to exclude delayed envenoming - signs of neurotoxicity such as ptosis for a period of at least 12 hours. Tetanus prophylaxis is recommended for all bites. Antibiotics are not recommended. *Antivenom:* Antivenom in 1:10 dilution, with normal saline or Hartmann's solution, administered intravenously is the mainstay of treatment in patients with systemic envenoming. Premedication with adrenaline, antihistamines or corticosteroids are not recommended. **Prevention**: environmental control – physical and chemical
Analyze and interpret data	**Time**: Analyse the reported cases and treatment coverage in targeted areas **Place:** Map the distribution of snakebite to identify areas requiring interventions. **Person**: Assess the prevalence and intensity of snake bite periodically by age group
Reference	1. http://www.who.int/neglected_diseases/diseases/snakebites/en/ 2. http://www.australianprescriber.com/magazine/29/5/125/9#.UXjneHB97dk

Soil-transmitted helminthiasis (STH)

Background	• More than 2000 million people worldwide (1 in 3) are infected by intestinal helminths, some of which can lead to severe diseases (hookworm anaemia). Worm infestations have proven to affect school and work performance and are therefore of economic importance. *Causal agents: Ascaris lumbricoides, Hookworm, Trichiuris trichiura* *Main modes of transmission*: **I**nfection occurs through the ingestion of eggs (ascariasis and trichiuriasis) or through active penetration of larvae in the soil (hookworm). Incubation is 4 to 8 weeks for *A. lumbricoides* and a few weeks to many months for hookworm disease; it is unspecified for *Trichiuris.* **Clinical description** **Hookworm:** ▪ Anaemia induced by intestinal blood loss. **Other intestinal helminths:** Symptoms are often mild and may go unrecognized in individuals. The symptoms include: ▪ Intestinal manifestations (diarrhoea, abdominal pain) ▪ Non-specific chronic symptoms ▪ General malaise and weakness that may affect working and learning capacities ▪ Long-term impact on physical growth • Data from general health statistics will underestimate the prevalence but may indicate a relatively high prevalence in a particular area. Surveillance of schistosomiasis has to take into account the geographical distribution of the disease, which is focal, and adjacent areas may have very different patterns and rates. Surveillance should be incorporated in the primary health care system. • Routine monthly reporting of aggregated suspected or confirmed cases from peripheral level to intermediate and central level. • In zones endemic for intestinal schistosomiasis, where surveillance through the primary health care system has less epidemiological value, surveys to evaluate the prevalence and intensity of infection in the community are useful. Children of school age are good indicators of the endemic level in the general population and as an appropriate group for investigation. • Yearly reporting of aggregated data from peripheral level to intermediate and central levels. • **International:** Yearly reporting from the central level to WHO
Surveillance goal	.

Soil-transmitted helminthiasis (STH)

Recommended case definitions	**Ascariasis:** 　**Suspected:**Abdominal or respiratory symptoms with history of passing worms. 　**Confirmed:** suspected case, **and p**assage of Ascaris lumbricoides (anus, mouth, nose), **or p**resence of Ascaris lumbricoides eggs in stools **Hookworm infection** 　**Suspected:**Severe anaemia for which there is no other obvious cause. 　**Confirmed :** suspected case and presence of hookworm ova in stools. **Trichuriasis** 　**Suspected:** Bloody, mucoid stools. 　**Confirmed:** suspected case, **and p**resence of T. trichiura eggs in stools.
Recommended public health action	Conduct school children surveys to determine cmmunity prevalence of infection in suspected communities **Case management** 　For treatment, WHO recommends the following 2 drugs: 　　• 400 mg albendazole, **or** 　　• 500 mg mebendazole, **or** **Prevention** 　*Overall:* 　　Personal hygiene, disposal of faeces, hand-washing, and clean food; 　　Improvements in sanitation standards 　　Community treatment for high-risk groups (children, pregnant women) as for individual treatment. 　　　• 400 mg albendazole (to be chewed before swallowing), **or** 　　　• 500 mg mebendazole (to be chewed before swallowing), 　*Hookworm infection (suspected or confirmed) in addition:* 　　In highly endemic areas, wear shoes; consider drug treatment and iron supplementation in women of childbearing age.
Analyze and interpret data	**Place:** Analyse the treatment coverage in targeted areas **Time:** Map the distribution of soil-transmitted helminthiasis to identify areas requiring intervention. **Person:** Assess the prevalence and intensity of infection in school children periodically
Reference	• WHO. 2006. Preventive chemotherapy in human helminthiasis. • WHO, Geneva, April 2006 *Weekly Epidemiological Record*, 2006, 81:145–164 • WHO. 2002. Prevention and Control of Schistosomiasis and STH Report of a WHO Expert Committee. WHO Technical Report Series 912.

Trachoma

Background

- Trachoma is the leading cause of preventable blindness worldwide. It is caused by infection with *Chlamydia trachomatis* bacteria, and is both treatable and preventable.

- Infections often begin during infancy or childhood and can become chronic. If left untreated, the infection eventually causes the eyelid to turn inwards, which in turn causes the eyelashes to rub on the eyeball, resulting in intense pain and scarring of the front of the eye. This ultimately leads to irreversible blindness, typically between 30 and 40 years of age.

- Trachoma is easily spread through direct personal contact, shared towels and cloths, and flies that have come in contact with the eyes or nose of an infected person.

- WHO estimates that approximately 6 million cases of blindness due to trachoma and 11 million cases of trichiasis occur worldwide each year. Prevalence of active disease in children varies from 10-40% in some African countries.

- The infection primarily affects young children, with blindness occurring later in life. Females are three times more likely than males to suffer from trichiasis, the in-turning of the eyelashes that can lead to blindness. People are most at risk for trachoma infection in areas where there is poor sanitation, lack of latrines, poor sources of clean water, and the presence of flies.

- Primary interventions advocated for preventing trachoma infection include improved sanitation, reduction of fly breeding sites and increased facial cleanliness (with clean water) among children at risk of disease. The scaring and visual change for trachoma can be reversed by a simple surgical procedure performed at village level which reverses the in-turned eyelashes.

Surveillance goal

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

Standard case definition

Suspected case:
Any patient with red sticky eyes who complains of pain and itchiness of the eyes.

*Confirmed case***:**
Any patient with red sticky eyes who complains of pain and itchiness of the eyes where examination of the eyes confirms one of the stages of Trachoma infection according to the **WHO Simplified Trachoma Grading System**. (see reference below).

Trachoma

Recommended public health action

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

Effective Trachoma control has four main components:

- Eye lid surgery for those at immediate risk of blindness
- Antibiotics to treat individual cases and to reduce infection in a community
- The promotion of facial cleanliness and hygiene to reduce transmission
- Environmental improvements such as provision of water and household sanitation

Analyze and interpret data

Time: Monitor epidemiologic trends over time.

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

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

Lab confirmation

Routine laboratory confirmation for surveillance is not required.

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

Trachoma

Reference

- WHO Trachoma Page
  http://www.who.int/topics/trachoma/en/

- World Health Organization. Trachoma control: A guide for program managers.
  Geneva: World Health Organization, 2006.
  http://www.who.int/blindness/publications/tcm%20who_pbd_get_06_1.pdf

- World Health Organization. Achieving Community Support for Trachoma Control.
  Geneva: World Health Organization, 1993.
  http://www.who.int/blindness/achieving_en.pdf

- World Health Organization. Primary Health Care Level Management of trachoma.
  Geneva: World Health Organization, 1993.
  http://www.who.int/blindness/publications/trachoma_english.pdf

- World Health Organization. Trachoma epidemiologic survey protocol.
  Geneva: World Health Organization, 1993.
  http://www.who.int/blindness/prevalence_protocol_trachoma_english.pdf

- CDC Trachoma
  http://www.cdc.gov/healthywater/hygiene/disease/trachoma.html

- The Carter Center
  http://www.cartercenter.org/health/trachoma/index.html

Human African Trypanosomiasis (HAT)

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

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.
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 lab.
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

Tuberculosis

Background

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

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

- The global HIV pandemic has been a major cause of increasing TB cases, especially in African countries.

- Incubation period is approximately 1 to 3 months.

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

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

Surveillance goal

- Early detection of persons with infectious lung disease to improve chances of clinical improvement and reduce transmission of TB.

- Improve percentage of TB cases confirmed by microscopy

Standard case definition

Suspected case:

Any person with a cough of 3 weeks or more.

Confirmed case:

Smear-positive pulmonary TB: a) a suspected patient with at least 2 sputum specimens positive for acid-fast bacilli (AFB), or b) one sputum specimen positive for AFB by microscopy and radiographic abnormalities consistent with active PTB as determined by the treating medical officer, or c) one positive sputum smear by microscopy and one sputum specimen positive on culture for AFB.

Smear negative PTB: a patient who fulfils all the following criteria: a) two sets taken at least 2 weeks apart of at least two sputum specimens negative for AFB on microscopy, radiographic abnormalities consistent with PTB and a lack of clinical response despite one week of a broad spectrum antibiotic, a decision by a physician to treat with a full course of anti-TB chemotherapy, or b) a patient who fulfils all the following criteria: severely ill, at least two sputum specimens negative for AFB by microscopy, radiographic abnormalities consistent with extensive pulmonary TB (interstitial and miliary), a decision by a physician to treat with a full course of anti-TB chemotherapy, or c) a patient whose initial sputum smears were negative, who had sputum sent for culture initially, and whose subsequent sputum culture result is positive.

Respond to alert threshold

If you observe that the number of cases or deaths is increasing over a period of time:
- Report problem to the next level, or according to national guidelines.
- Treat individual cases with direct observation (DOTS) including a treatment supporter.
- Where feasible, isolate persons using respiratory infection control practices, especially if multi-drug resistant TB is suspected.
- Investigate cause of increase, including performance of DOTS program in your area.

Respond to action threshold

If the number of cases or deaths increases to two times the number usually seen in a similar period in the past:
- Assess health worker performance with detection and treatment of smear-positive PTB and improve practices as needed.
- Assess DOTS program and take action to make identified improvements.
- Conduct drug susceptibility tests to establish patterns of resistance.

Analyze and interpret data

Time: Graph cases and deaths monthly.

Place: Plot distribution of case households and workplaces.

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

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

Reference

- *Treatment of Tuberculosis: Guidelines for National Programs.* WHO/TB/97.230
- *Policy Statement of Prevention Therapy Against TB in People Living with HIV,* WHO/TB/98.255

- Laboratory Services in Tuberculosis Control, Parts I, II and III. WHO publications WHO/TB/98.258

- Guidelines to surveillance of drug resistance in tuberculosis 4th ed. WHO/HTM/TB/2009.422

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

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

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 administrated

How to prepare, store, and transport	5-10 ml of blood distributed in a blood culture bottle. Stool in stool container Store specimens at 4-8 C or ambient temperature away from heat and direct sunlight.
Results	Blood culture 4 days to 2 weeks Stool 3-4 days.

Reference

- *The Diagnosis, Treatment and Prevention of Typhoid Fever*; WHO/V&B/03.07

- Weekly Epidemiological Record; N° 1, 2005, 80, 1-8; http//www.who.int/wer

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

West Nile Fever

Background

- West Nile Fever is a febrile illness resulting from a mosquito-borne arbovirus in the *Flavivirudae* family. It is a zoonotic disease transmitted from birds to humans and other animals. Serological evidence suggests that the infection is present throughout practically the entire African continent. West Nile Fever most likely emerged in Africa and is now found world-wide. Outbreaks occur in humans, birds and horses.

- Most cases are mild and may not come to the attention of the health system. Patients seeking health care usually present with flu-like symptoms such as fever, headache and body aches. Occasionally patients present with a skin rash on the neck, trunk, arms or legs.

- People of all ages and conditions may be affected. However, those who are above age 50 years or who have had an organ transplant are at increased risk of severe illness.

- Very severe cases include signs of encephalitis, meningo-encephalitis or meningitis. Symptoms include high fever, headache, neck stiffness, stupor, tremors, convulsions, flaccid paralysis and coma.

- The case fatality rate in patients with neurological involvement ranges from 4% to 14% and as high as 29% in elderly patients.

- West Nile Fever can be prevented by avoiding mosquito bites especially at dusk when mosquitoes are most active. Insect repellents, wearing long sleeves and trousers, staying indoors and draining breeding sites like pools of standing water can reduce exposure to mosquitoes.

- Confirmation of West Nile Fever in patients with clinical symptoms requires laboratory confirmation of specific IgM antibodies in cerebrospinal fluid and serum specimens.

- Because there is no specific treatment for West Nile Fever, patients with severe disease are usually hospitalized for supportive treatment and nursing care.

Surveillance goal

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

Standard case definition

Suspected case:
A hospitalized case of encephalitis due to unknown cause

Confirmed case:
Confirmation of West Nile Fever is through laboratory diagnostics to identify WNV-specific IgM

Respond to alert threshold

If a single case is suspected:
- Report case-based information immediately to the appropriate levels.
- Treat and manage the patient with supportive care.
- Collect specimen safely to confirm the case.

Respond to action threshold

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

Analyze and interpret data

Time: Construct an epidemic curve during the outbreak.

Place: Plot location of case residence and worksite.

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

Laboratory confirmation

Diagnostic test	Presence of IgM antibodies against West Nile Fever
Specimen	*For ELISA*: Whole blood, serum or plasma *For PCR*: Whole blood or blood clot, serum/plasma or tissue *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

- Global Alert and Response; West Nile Fever epidemic updates
  http://www.who.int/csr/don/archive/disease/west_nile_fever/en/

- Pedro N. A and Boris Szyfres. *Zoonoses and Communicable Diseases Common to Man and Animals. Third edition, Volume II*. Chlamydioses, Rickettsioses and Viroses, Part II: Viroses Pages 372-376. Pan American Health Organization, WHO

- Epidemic/Epizootic West Nile Virus in the United States: Guidelines for Surveillance, Prevention and Control.   http://www.cdc.gov/ncidod/dvbid/westnile/resources/wnv-guidelines-aug-2003.pdf

- Infection Control for Viral Hemorrhagic Fevers in the African Health Care Setting WHO/EMC/ESR/98.2

- Evans, A.S. (ed). *Viral Infections of Humans; Epidemiology and Control*. 1989. Plenum Medical Book Company, New York

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

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

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, LGA 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

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 totals weekly.
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	1. ELISA for the presence of yellow fever Specific IgM and IgG antibodies. 2. Exclusion of Dengue, West Nile virus and other locally prevalent flavivirus will be necessary for the confirmation of yellow fever. 3. PCR, YF specific seroneutralization, virus isolation or histopathology
Specimen	Serum in the acute and convalescent phases of the illness; In the event of death, postmortem liver specimen
When to collect the specimen	Within 14 days of onset of first symptoms Collect specimen from at least the first to 10th suspected cases of yellow fever. Collect specimen from last cases (based on epidemic curves) to decide on the end of the epidemic.

How to prepare, store, and transport the specimen	- Collect 10 ml of venous blood from adults, 1-5 ml from children, in a capillary tube, microtainer, or if necessary in a standard glass test tube. - Separate blood cells from serum: - Let clot retract for 30 to 60 minutes at room temperature. Centrifuge at 2000 rpm for 10-20 minutes and pour off serum into a clean glass tube. - If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clot retracts. Pour off serum the next morning. - If no centrifuge and no refrigerator, let blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle. 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

- *LGA 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

Annexes to Section 9

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

ANNEX 9A AEFI - investigation form

ANNEX 9B Acute flaccid paralysis - case investigation form

ANNEX 9C Cholera - case-based investigation form

ANNEX 9D Guinea worm - case investigation form

ANNEX 9E Maternal death - reporting form

ANNEX 9F Measles - case investigation form

ANNEX 9G Neonatal tetanus - case investigation form

ANNEX 9H Tuberculosis - MDR and XDR TB - case-based reporting form

ANNEX 9I Viral hemorrhagic fever - case report form

ANNEX 9J VHF - case investigation form

ANNEX 9A   Adverse Events following Immunization – investigation form

AEFI Investigation
An adverse event following immunization (AEFIs) is a medical incident that takes place after an immunization, causes concern and is believed to be caused by the immunization. Programmes providing immunization services should include a system for AEFI detection and reporting, investigation and management, data analysis, corrective action, relevant communication and evaluation of the system. The ultimate goal of an investigation is to determine whether the vaccine or immunization process is responsible for the reported event(s) or to find another cause and correct it if possible, and reassure the public. **Further resources:** http://www.who.int/immunization_safety/aefi/en/ http://www.who.int/immunization_safety/aefi/managing_AEFIs/en/index6.html http://www.who.int/immunization/documents/792.pdf

1.	**Be prepared (Steps to take before an event occurs)** • Read the resource documents on reporting, management and investigation of AEFIs. • Develop standards: case definitions for reportable AEFIs, use of reporting forms and investigation procedures. • Designate and train staff to conduct an AEFI investigation using the investigation form. • Train staff on how to collect specimens. • Establish procedure, criteria and designated person for notifying WHO and UNICEF • (if UN- supplied vaccine) or other relevant party depending on procurement mechanism • Establish a National Technical Advisory Committee with representation from major medical organizations • Identify a spokesperson for public communications.
2.	**Receiving a report** • Ensure immediate reporting of most serious events and rapid attention to reports received • Verify the information in the report and classify and assess the AEFI using established case definitions. Decide whether it needs further investigating. • If investigation is warranted, travel to the location of the AEFI, or delegate responsibility to another trained person
3.	**Investigate and collect data** • Ask about the patient • Ask about the vaccine and other drugs potentially received • Ask about other vaccinees • Ask about immunization services • Observe the service in action

	• Ask about cases in unvaccinated persons • Establish a more specific case definition if needed • Formulate a hypothesis as to what caused the AEFI **Collect specimens if appropriate:** • from the patient • the vaccine (and diluent if applicable) • the syringes and needles
4.	**Dispatch specimens** to appropriate testing facility (laboratory, regulatory authority, etc.)
5.	**Analyze the data** • Review epidemiological, clinical, and laboratory findings • Summarize and report findings
6.	**Take action** • Communicate with health staff • Communicate findings and action to the parents and public • Correct problem (based on the cause) by improving training, supervision, and/or distribution of vaccines/injection equipment • Replace vaccines if indicated

ANNEX 9B   Acute flaccid paralysis – case investigation case form

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

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

Address:
_____
_____
_____

Name(s) of patient: _____   Mother/Father: _____
_____

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

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

HOSPITALIZATION
Admitted to hospital? ☐ 1= Y, 2= N   Date of admission _____/_____/_____
Medical record number: _____
Facility Address:

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

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

Site of paralysis

LA	RA
LL	RL

Onset of paralysis: ____/_____/_____

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

VACCINATION HISTORY   Birth _____/_____/_____   3rd _____/_____/_____

Total Doses of Polio: ☐ 99=Inconnu   1st _____/_____/_____   4th _____/_____/_____
                                          2nd _____/_____/_____   If >4, last dose _____/_____/_____

SPECIMEN COLLECTER DE SELLES   **Date Sent to**
Date 1st Stool: _____/_____/_____ Date 2nd Stool: _____/_____/_____   National lab:
____/_____/_____

STOOL SPECIMEN RESULTS: Condition of Stool: ☐ 1=Adequate, 2= Not Adequate
_____/_____/_____   _____/_____/_____   _____/_____/_____
Date received by national Lab   Date results sent by lab to LGA   Date results receive by LGA
_____/_____/_____   _____/_____/_____   _____/_____/_____
Date isolate sent by national Lab to regional lab Date differentiation result sent by regional lab   Date differentiation result received by LGA

Primary Isolation Results:	P1	P2	P3	NP-Ent	W1	W2	W3	V1	V2	V3	NP-Ent

FOLLOW UP EXAMINATION

Date of follow up examination: _____/_____/_____   Findings at Follow-up: ☐

1= Residual paralysis   3= Lost to follow-up

2= No residual paralysis   4= Death before follow-up

LA ☐☐ RA
LL ☐☐ RL
    Residual Paralysis?

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

INVESTIGATOR

Name: _____   Title:

_____

Unit: _____ Address: _____ Phone:

_____

ANNEX 9C   Cholera - case-based investigation form

	Cholera Case Investigation Form	
	Area : Patient and clinical laboratory related information	
	Variables/Questions	**Answers**
1	Detection day (dd/mm/yyyy)	
2	Detection place (Health facility or Community)	
3	Patient identification number (yyyy-week-CCC-PPP-DDD-Reporting site-nnn)	
4	Patient surname or last name	
5	Patient first name(s)	
6	Age (years)	
7	Sex (F/M)	
8	Number of people in same household	
9	Patient's residential Address	
10	Village/Town	
11	Neighborhood	
12	LGA	
13	State	
14	Country	
15	Date of onset (first symptoms) (dd/mm/yyyy)	
16	Clinical signs and Symptoms	
17	Was patient exposed to any known risk factor for this disease? (Yes/No)	
18	If yes, specify risk factor(s): Water used by the patient for drinking : (list by type, e.g. tap water, Borehole, unprotected well, protected well, River, dum, lake, pond)	
19	Number of doses of cholera Vaccine	
20	Date last dose was administered	
21	**Laboratory related information: at least first and last cases**	
22	*Vibrio cholerae* identified in stools?	
23	Drugs to which the vibrio strain is sensitive	

24	Drugs to which the vibrio strain is resistant	
25	Outcome (Died, Survived, Unknown)	
26	Final Classification (Not a case, Suspect, Probable, Confirmed by Lab, Confirmed by epidemiological link, Pending)	
27	Other Notes and Observations	
28	Date latest update of this record (dd/mm/yyyy)	

Area: Risk factor search (Information to be obtained from the water and sanitation group of the investigation team)

	Variables/Questions	Answers
	Mapping Potential Hazards	
1	**Potential vibrio vehicles: drinking water**	
2	Drinking water source 1	
3	Drinking water source 2	
4	Drinking water source 3	
5	Drinking water source 4	
6	**Potential vibrio vehicles: non drinking water**	
7	Non drinking water source 1	
8	Non drinking water source 2	
9	Non drinking water source 3	
10	Non drinking water source 4	
11	**Potential vibrio vehicles: Food items**	
12	Food items 1	
13	Food items 2	
14	Food items 3	
15	Food items 4	
	Food items 5	
17	Food items 6	
18	Food items 7	
19	Food items 8	
20	**Bacteriology lab findings**	
21	Drinking water found infected by vibrio	
22	Non drinking water found infected by vibrio	
23	Food items found infected by vibrio	

24	**Looking out for Exposure to the identified hazards**	
25	Water used by the patient for drinking : (list by type, e.g. tap water, Borehole, unprotected well, protected well, River, dum, lake, pond):	
26	Within 3 days prior to the onset of the disease did the patient drink from	
27	Water source 2 (Yes/No)	
28	Water source 3 (Yes/No)	
29	Water source 4 (Yes/No)	
30	Water source 5 (Yes/No)	
31	Within 3 days prior to the onset of the disease did the patient eat	
32	Food item 1 (Yes/No)	
33	Food item 2 (Yes/No)	
34	Food item 3 (Yes/No)	
35	Food item 4 (Yes/No)	
36	Food item 5 (Yes/No)	
37	Within 3 days prior to the onset of the disease did the patient attend any	
38	funerals (Yes/No)	
39	other social event (Yes/No)	

ANNEX 9D   Guinea worm - case investigation form

[Country Name]

GUINEA WORM ERADICATION PROGRAMME
CASE INVESTIGATION FORM FOR GUINEA WORM DISEASE

Epid No:_ _ _-_ _ _-_ _ _-_ _-_ _ _ _
    C O U-R E G-D I S-Y R-C A S E   *To be completed in triplicate*

I. Reporting/Investigation Information

Reporting Village:_____Zone:_____LGA:_____ Region:_____

Date Case Reported: (dd/mm/yyyy)___/___/_____   Reported by:_____Position:_____

Date Case Investigated: ____/___/_____   Investigated by:_____Position:_____

II. Patient Information and Place of Residence

Name:_____ Father's Name/Landlord's Name:_____
Age:_____Sex:_____Occupation:_____Ethnicity_____
Resident Address: Village:_____ Zone:_____
Area/Sub LGA:_____ LGA:_____Region:_____
Setting: Urban/Rural_____ Land Marks:_____

Place of residence is same as the reporting village: YES/NO   Residence since when(in months):_____
(Please fill BOX "III. Place stayed in the last 10-14 months …." if the number of months stayed in this box was less than 10.)

III. Place stayed in the last 10-14 months if not the same as above.

Village:_____ Zone:_____ Area/Sub LGA:_____
LGA:_____Region:_____ Country:_____

IV. Travel History of patient in the last 10-14 months

Date From:	Date To:	Village:	Sub LGA	LGA:	Region:
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Possible water sources that the patient might have contaminated with location details and GPS:

Name	Lattitude	Longitude	Type	Source	Check box if Treated with Abate and Date
_____	_____	_____	_____	_____	☐ _____
_____	_____	_____	_____	_____	☐ _____
_____	_____	_____	_____	_____	☐ _____
_____	_____	_____	_____	_____	☐ _____

V. Sign and symptom

GUINEA WORM ERADICATION PROGRAMME
CASE INVESTIGATION FORM FOR GUINEA WORM DISEASE

Epid No:_ _ _-_ _ _-_ _ _-_ _-_ _ _ _
       C O U-R E G-D I S-Y R-C A S E   *To be completed in triplicate*

What was the first sign/symptom before the emergence of worm? Blister/Itching/Swelling/Others,Specify_____
Emergence of guinea worm: YES/NO No of Worms:_____   Is this the first guinea worm emerged this year? YES/NO
Date of the First guinea worm emerged:___/___/_____ Was the case detected before worm emerged? YES/NO

VII. Case Containment Measures and Guinea-worm registry

Received any health education: YES/NO   Patient entered any water source: YES/NO
Place Managed: CCC/Home/Health Centers/Hospital
Name of Health Facility/Health Center/Other Centers if patient was hospitalized:_____

Admission Date: ___/____/_____   `   Discharged Date: ___/____/_____

SN.NO. Location of worm Extracted	Date worm detected emergence	Date of guinea-worm by supervisor:	Date confirmed	Date of guinea-worm completely expelled	Regular bandaging
___ _____ ☐	__/__/_____	__/__/_____	__/__/_____	__/__/_____	☐
___ _____ ☐	__/__/_____	__/__/_____	__/__/_____	__/__/_____	☐
___ _____ ☐	__/__/_____	__/__/_____	__/__/_____	__/__/_____	☐
___ _____ ☐	__/__/_____	__/__/_____	__/__/_____	__/__/_____	☐
___ _____ ☐	__/__/_____	__/__/_____	__/__/_____	__/__/_____	☐
___ _____ ☐	__/__/_____	__/__/_____	__/__/_____	__/__/_____	☐
___ _____ ☐	__/__/_____	__/__/_____	__/__/_____	__/__/_____	☐

VIII. Specimen Handling

Was a specimen (worm) saved and preserved in alcohol?YES/NO If NO WHY?

Date sent to Region:_____Received By:_____Date Received by:_____

Date sent to National: _____Received By:_____Date Received by:_____

For National Secretariat Only:
Did you send it for confirmation?Yes/No Date sent: _____Sent
To:_____
Date Result Received_____

Result:

GUINEA WORM ERADICATION PROGRAMME
CASE INVESTIGATION FORM FOR GUINEA WORM DISEASE

Epid No:_ _ _-_ _ _-_ _ _-_ _-_ _ _ _
      C O U-R E G-D I S-Y R-C A S E   *To be completed in triplicate*

IX. Other Information

Use of cloth filter: YES/NO   Frequency of changing filters 1-rarely; 2-sometimes; 3-always; 4-never
Remarks:_____

Person who completed this form:

_____   _____   _____
_____
NAME   POSITION   CELL PHONE NO
SIGNATURE

Disease Control or Surveillance Officer:

ANNEX 9E   Maternal death - reporting form

Maternal Death Reporting Form	
The form must be completed for all deaths, including abortions and ectopic gestation related deaths, in pregnant women or within 42 days after termination of pregnancy irrespective of duration or site of pregnancy	
Questions / Variables	**Answers**
1	Country	
2	LGALGALGA	
3	Reporting Site	
4	How many of such maternal deaths occured cumulatively this year at this site?	
5	Date this maternal death occured (day/month/year)	
6	Maternal death locality (Village or Town)	
7	Record's unique identifier (year-Country code-LGALGALGA-site-maternal death rank)	
8	Maternal death place (Community, health facility, LGALGALGA hospital, referral hospital or private hospital, on the way to health facility or hospital)	
9	Age (in years) of the deceased	
10	Gravida: how many times was the deceases pregnant?	
11	Parity: how many times did the late deliver a baby of 22 weeks/500g or more?	
12	Time of death (specify "During pregnancy, At delivery, during delivery, during the immediate post partum period, or long after delivery")	
13	If abortion: was it spontaneous or induced?	
Maternal death history and risk factors	
14	Was the deceased receiving any antenatal care? (Yes/No)	
	Did she have Malaria? (Yes or No)	
15	Did she have Hypertension ? (Yes or No)	
16	Did she have Anaemia? (Yes or No)	
17	Did she have Abnormal Lie? (Yes or No)	
18	Did she undergo any Previous Caesarean Section? (Yes or No)	
19	What was her HIV Status? (choose "HIV+; HIV-; or Unknown HIV status")	
	Delivery, puerperium and neonatal information	
20	How long (hours) was the duration of labor	
21	What type of delivery was it? (choose one from "1=Vaginal non assisted delivery, 2= vaginal-assisted delivery (Vacuum/forceps), or 3=Caesarean section"	
22	What was the the baby status at birth? (Alive or Stillborn)	

Maternal Death Reporting Form

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

	Questions / Variables	Answers
23	In case the baby was born alive, is he/she still alive or died within 28 days after his/her birth ? (choose 1=Still alive, 2=neonatal death, 3=died beyond 28 days of age)	
24	Was the deceased referred to any health facility or hospital? (Yes/No/Don't know)	
25	If yes, how long did it take to get there? (hours)	
26	Did the deceased receive any medical care or obstetrical/surgical interventions for what led to her death? (Yes/No/Don't know)	
27	If yes, specify where and the treatment received*	
28	Primary cause of the Maternal Death	
29	Secondary cause of the Maternal Death	
30	Analysis and Interpretation of the information collected so far (investigator's opinion on this death)	
31	Remarks	
32	Maternal death notification date (day/month/year)	
33	Investigator (Title, name and function)	
	* Treatment received	
	I.V. Fluids; Plasma; Blood Transfusion; Antibiotics; Ocytocin; Anti-seizure drugs; Oxygen; Anti-malarial; Other medical treatment; Surgery; Manual removal of placenta; Manual intra uterin aspiration; Curettage, laporotomy, hysterctomy, intsrumental delivery (Forceps;Vacuum), Caesarian section, anetshesia (general, spinal, epidural , local)	
	Definitions	
	Gravida: The number of times the woman was pregnant- Parity: Number of times the woman delivered a baby of 22 weeks/500g or more, whether alive or dead	

ANNEX 9F   Measles - case investigation form

MEASLES CASE INVESTIGATION FORM	
Variable/Description	**Value/Answer**
Country	
ID number	
Reporting LGALGALGA	
Province of report	
Reporting health facility	
Disease/Condition	Measles
Date received form at national level (day/month/year)	
Name(s) of patient	
Date of birth (day/month/year)	
Age in years	
Age in months	
Patient's residence: village/neighbourhood	
Town/City	
Urban/Rural	
LGALGALGA of Residence	
Province	
Sex (M/F)	
Date seen at health facility (day/month/year)	
Date health facility notified LGALGALGA (day/month/year)	
Date of onset (day/month/year)	
Number of vaccine doses	
Date of last vaccination (day/month/year)	
Blank variable #1	
Blank variable #2	
In-patient or Out-patient?	
Outcome (1=Alive; 2=Dead; 3=Unknown)	
Final classification (1=Lab Confirmed; 2=Confirmed by Epidemiological linkage; 3=Compatible; 4=Discarded (IgM negative); 5= Pending (Suspected with specimen lab results pending)	
Date sent form to LGALGALGA (day/month/year)	
Date received form at LGALGALGA (day/month/year)	
Date specimen collection (day/month/year)	
Date specimen sent to Lab (day/month/year)	
Specimen source	

MEASLES CASE INVESTIGATION FORM	
Variable/Description	**Value/Answer**
Specify	
Date lab received specimen (day/month/year)	
Specimen condition [1=adequate (good); 2=not adequate (not good)]	
Measles IgM (1=positive; 2=negative; 3=indeterminate; 4=pending)	
Rubella IgM (1=positive; 2=negative; 3=indeterminate; 4=pending)	
Other lab results	
Date lab sent results to LGALGALGA (day/month/year)	
Date LGALGALGA received lab results (day/month/year)	
Name, title and function of reporting officer	

ANNEX 9G   Neonatal tetanus - case investigation form

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

IDENTIFICATION

LGALGALGA: _____   Province:

_____

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

Address: _____

Name(s) of patient: _____   Mother: _____

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

NOTIFICATION/INVESTIGATION

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

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

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

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

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

3rd _____/_____/_____ If >5, last dose_____/_____/_____

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

BIRTH OF INFANT

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

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

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

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

Was baby normal at birth?		Spasms or Convulsions?	
Normal cry and suck during first 2 days?		Complications?	
Stopped sucking after 2 days?		Did the baby die?	
Arched back?		Age at death:	Days
Stiffness?		Age of onset in days:	Days (99=Unknown)

Onset of symptoms: ____/_____/_____

TREATMENT

Date of admission _____/_____/_____

Medical record number: _____

Facility Address:

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

COMMENTS:

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

Questions

Mother given protective dose of TT within 3 months of report?

Supplemental immunization within same locality as the case?

Answer

Date of response: _____/_____/_____

Details of response: _____

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

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INVESTIGATOR

Name: _____   Title:_____

Unit: _____ Address: _____

Phone:_____

Case based Multi-Drug Resistant and Extensively Drug Resistant Tuberculosis Report Form

Country:		Year:	
Quarter:		**Month:**	**Drug Susceptibility Test Results** (S=sensitive; R=Resistant; I=intermediate; U=unknown)

Case unique Identifier (Detection year-Country code-Number in Tb Register)	Sex (F/M)	Age (Years)	Date of Diagnosis (dd/mm/yyyy)	Type of Notification (MDR-TB* or XDR-TB**)	TB Site (Pulmonary or extra Pulmonary)	Type of TB Case (New /Relapse /After default /After failure of first treatment /After failure of re-treatment /Transfer in /Other)	Patient Treatment Status (On treatment /Not on treatment /Don't Know)	HIV Status (positive /negative /Unknown)	H	R	E	Z	S	Th	Am	Km	Cm	Cfx	Ofx	Lfx	Mfx	Gfx	Gfx	Pto	Eto	Cs	PAS	Other (Specify)

* Multi-drug Resistant TB = Resistance to at least Isoniazid and Rifampicin

**Extensively Drug Resistant TB = MDR-TB plus: Resistance to any fluoroquinolone such as Ciprofloxacin, Oxfloxacin, etc, and Resistance to at least one of the three second line injectable anti-TB drugs (Capreomycin, Kanamycin and Amikacin).

First-line drugs: H = Isoniazid   R = Rifampicin   E = Ethambutol   Z = Pyrazinamide   S = Streptomycin   Th = Thioacetazone

Second-line drugs: Am=Amikacin Km=Kanamycin Cm=Capreomycin Cfx=Ciprofloxacin Ofx=Ofloxacin Lfx=Levofloxacin Mfx=Moxifloxacin Gfx=Gatifloxacin Pto=Protionamide Eto=Ethionamide Cs=Cycloserine PAS=P-aminosalicylic acid

ANNEX 9I   Viral hemorrhagic fever - case reporting form

	IDSR Viral Hemorrhagic Fever Case Report Form	
	Variables / Questions	**Answers**
1	Detection day (ddmm/yyyy)	
2	Detection place (Health facility or Community)	
3	Patient identification number (yyyy-week-CCC-PPP-DDD-Reporting site-nnn)	
4	Patient surname or last name	
5	Patient first name(s)	
6	Age (years)	
7	Sex (F/M)	
8	Number of people in same household	
9	Number of other contacts	
10	Patient's residencial adress	
11	Village/Town	
12	Neighborhood	
13	LGA	
14	State	
15	Country	
16	Date of first symptoms onset (dd/mm/yyyy)	
17	Observed Symptoms and Clinical signs	
18	Was patient exposed to any known risk factor for this disease? (Yes/No)	
19	If yes, specify risk factor(s)	
20	Lab results	
21	Final Classification (Not a case, Suspect, Probable, Confirmed by Lab, Confirmed by epidemiological link, Pending)	
22	Outcome (Died, Survived, Unknown)	
23	End of latest contact followed-up (dd/mm/yyyy)	
24	Other Notes and Observations	
25	Date latest update of this record (dd/mm/yyyy)	

ANNEX 9J   Viral hemorrhagic fever – case investigation form

ID Case
Date of reception: ___/___/___
Country: _____

Date of detection of the case   ___/___/___
This Case was notified by *(tick off the right answer and specified)*

☐ Mobile team, # _____   ☐ Health Centre _____

☐ Hospital   _____   ☐ Others: _____

Form filled by (first name and surname)   _____

Information given by (first name and surname)   _____

Family link with the patient   _____

Identity of the patient

First name:_____   Surname_____   Nickname _____

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

Birth date: ___/___/___   Age (years)_____Sex ☐ M ☐ F

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

   Village/Suburb_____   Country_____ GPS lat _____ long _____

Nationality: _____   Ethnic group _____

Profession of the patient *(tick off the right answer)*

     ☐ Health staff, details:

     Name of health care facility_____ Service _____ qualification _____

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

     ☐ Pupil/ Student   ☐ Farmers   ☐ Others _____

Status of the patient

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

Place of death: ☐ Community, name village   _____   Country_____

            ☐ Hospital, name and service   _____ Country _____

Place of the funerals, name village: _____   Country _____

History of the disease

Date of onset of symptoms: __/___/___

Name of the village where the patient got ill _____   *Country_____*

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

If Yes, indicate the places and the country:

     Village _____   Health Centers _____   Country_____

       _____   Health Centers _____   Country_____

Did the patient have fever**?**   ☐ Yes   ☐ No   ☐ DNK. If yes, date of onset for the fever: ___/___/___

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

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

Exposition Risks

• Was the patient hospitalized or did he visit anyone in the **hospital** anytime in the three weeks before becoming ill?   ☐ ☐Yes   ☐ No   ☐ DNK; If Yes,   where _____between (dates)___/___/__ and__/___/__

• Did the patient have visit/consult a **traditional healer** during the three weeks before becoming ill or during illness? ☐ Yes ☐ No   ☐ DNK; If Yes, name of the traditional healer _____Village _____ Country _____; When and where did the contact take place? Place _____ date: __/___/___

• Did the patient receive traditional medicine? ☐ Yes   ☐ No   ☐ DNK; If Yes, explain which kind: _____

• Did the patient attend **funeral ceremonies** during anytime in the three weeks before becoming ill? ☐ Yes   ☐ No   ☐ DNK;

• Did the patient **travel** anytime in the three weeks before becoming ill?☐ Yes   ☐ No   ☐ DNK
If Yes, where _____ between (dates)   ___/___/___ and ___/___/___

• Did the patient have a contact with a **known suspect case** anytime in the three weeks before becoming ill?
   ☐ Yes   ☐ No   ☐ DNK; If Yes, Surname _____First name _____ ID Case

• During the contact, the suspect case was ☐ Alive ☐ Dead   date of death   ___/___/___
   Date of last contact with the suspect case   ___/___/___

• Did the patient have contact with a **wild animal** (non-human primate or others), that was found dead or sick in the bush, or animal behaving abnormally anytime in the three weeks before the illness?
   ☐ Yes☐ No   ☐ DNK; If Yes, kind of animal _____ Location_____ date ___/___/___

Has a sample been collected?   ☐ Yes   ☐ No   ☐ DNK; If yes, date   ___/___/___
☐ Blood sampling   ☐ Urine ☐ Saliva ☐ Skin Biopsy
Was the patient sent to a hospital?   ☐ Yes   ☐ No
Was the patient admitted in the isolation ward?   ☐ Yes   ☐ No
If Yes, name of Hospital_____ No. de hospital _____   Hospitalization date ___/___/__

Update on the Hospital information   ID Case: _____
Reception date: ___/___/___   Country:_____ Member of family helping the patient: _____
Name and Surname _____ Date of discharge___/___/___OR Date of death___/___/___
Laboratory
A specimen was collected   ☐ before the death   ☐ After the death
Date sample   ___/___/___   Date results ___/___/___ ID Lab _____
Sample ☐ blood ☐ blood with anti-coagulants ☐ skin biopsy   ☐ cardiac function ☐ other: _____
Results   PCR   ☐ pos   ☐ neg   ☐ NA   date   ___/___/___
Antigen detection   ☐ pos   ☐ neg   ☐ NA   date   ___/___/___
Antibodies IgM ☐ pos   ☐ neg   ☐ NA   date   ___/___/___
      Antibodies IgG   ☐ pos   ☐ neg   ☐ NA   date   ___/___/___
      ImmunoHistochemistry ☐ pos   ☐ neg   ☐ NA   date   ___/___/___

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

Case Classification
☐ Alert Case   ☐ Suspect   ☐ Probable   ☐ Confirmed   ☐ Not a case