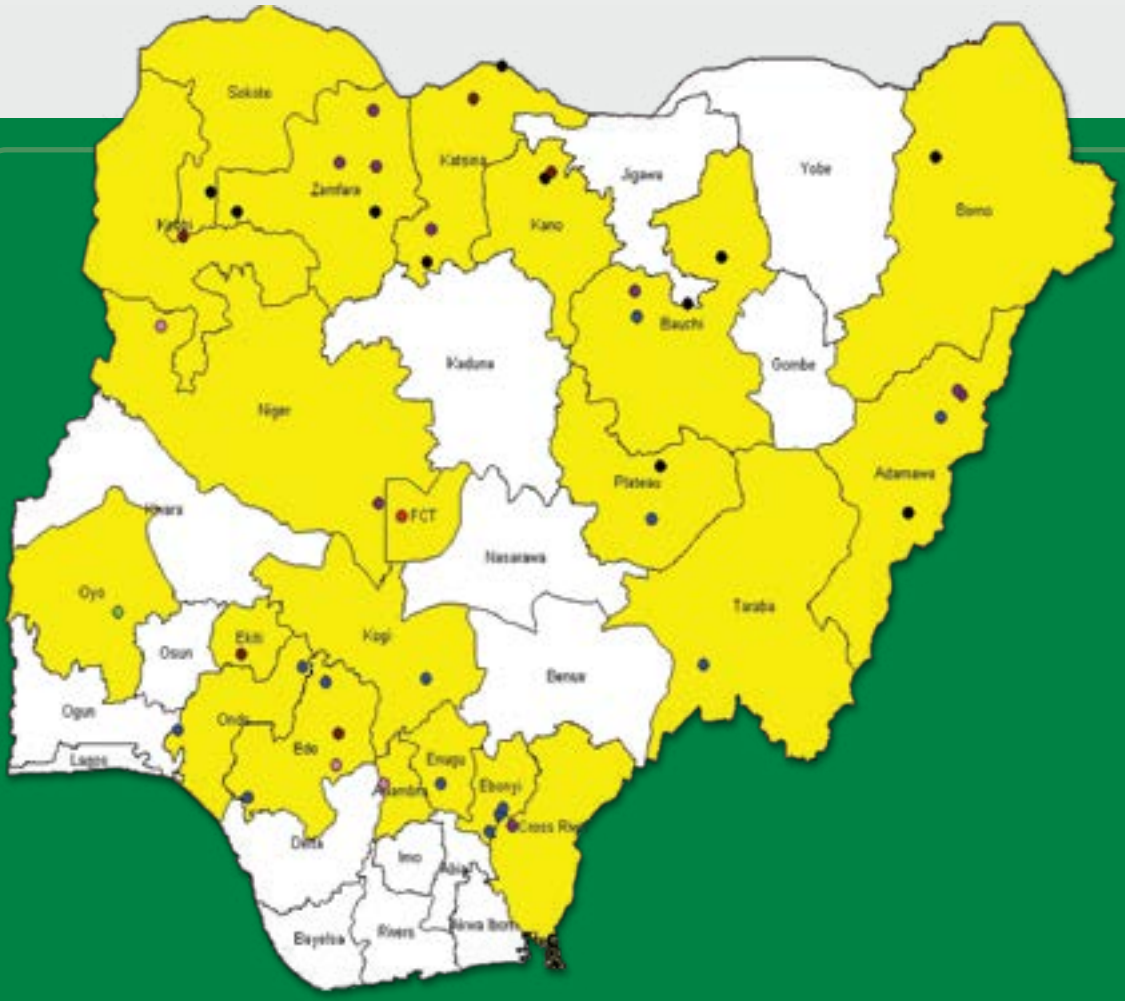
FEDERAL MINISTRY OF HEALTH



NATIONAL TECHNICAL GUIDELINES FOR

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE

NCDC

NIGERIA CENTRE FOR DISEASE CONTROL

World Health Organization

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Centre for Global Health

National Technical Guidelines for Integrated Disease Surveillance and Response

THIRD EDITION

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CONTENTS

ABBREVIATIONS

AAR	After Action Reviews
AFP	Acute Flaccid Paralysis
AFRO	WHO Regional Office for Africa
CDC	Centers for Disease Control and Prevention
CEBS	Community Event-based Surveillance
DPC	Disease Prevention and Control Department
DRM	Disaster Risk Management
DSNO	Disease Surveillance and Notification Officer
EBS	Event-Based Surveillance
EPI	Expanded Program on Immunisation
EPR	Emergency Preparedness and Response
EVD	Ebola virus disease
HCF	Healthcare Facility
HIV/AIDS	Human Immunodeficiency Virus And Acquired Immune Deficiency Syndrome
IDSR	Integrated Disease Surveillance And Response
IBS	Indicator Based Surveillance
IMS	Incident Management System
IPC	Infection Prevention and Control
IHR 2005	International Health Regulations (2005)
JEE	Joint External Evaluation
LGA	Local Government Authority
MDR	Multidrug Resistance
MoH	Ministry of Health
NGO	Non Governmental Organisation
PHEIC	Public Health Emergency Of International Concern
RRT	Rapid Response Team
SARS	Severe Acute Respiratory Syndrome
WHE	World Health Emergency
WHO	World Health Organisation
XDR	Extensively drug-resistant

GLOSSARY

DEFINITION OF TERMS

Acute	Any disease having a rapid (sudden) onset and following a short course
Alert	An indirect early warning sign of a potential public health event occurring in a community under surveillance. Alerts must be investigated further and verified as to whether they represent a true event or not
Chronic	Any health condition that develops slowly or is of long duration and tends to result in some functional limitation and need for ongoing medical care
Cluster	An aggregation of cases or health-related conditions in a given area, over a particular period, regardless of whether the number of cases is more than expected in relation to time or place or both
Disease	An illness or medical condition, irrespective of origin or source, which presents or could present significant harm to animals, humans and plants
Disaster	The serious disruption of the functioning of a community or a society, causing widespread human, material, economic or environmental losses exceeding the ability of the affected community or society to cope using its own resources
Elimination	Reduction to zero (or a very low defined target rate) of new cases in a defined geographical area
Endemic	An increase in the number of cases of a disease or an event above what is normally expected in that population in a given area over a particular period of time
Epidemic	Refers to an increase in the number of cases of a disease or an event above what is normally expected in that population in a given area over a particular period of time
Epidemiological link	When a patient has or had exposure to a probable or confirmed case
Epidemiology	The study of the distribution and determinants of health-related states and the application of this information to controlling public health problems
Eradication	The purposeful reduction of specific disease prevalence to the point of continued absence of transmission in the world
Aetiology	Refers to the cause, set of causes, or origin of a disease or condition

Event	Under the IHR (2005) (Article 1), an event is defined as 'a manifestation of disease, or an occurrence that creates a potential for disease' (with particular reference to public health events of international concern (PHEIC)). An emergency incident or occurrence. An event may be insignificant or could be a significant occurrence, planned or unplanned (e.g. extreme weather event or mass gathering), that may impact the safety and security of communities. NB: 'Event' and 'incident' are often used interchangeably
EWARS	This is a simple robust system designed to improve disease outbreak detection in emergency settings such as countries in conflict or following a natural disaster.it detects and responds rapidly to signals which may indicate outbreaks or clusters of epidemic prone diseases to prevent excess mortality and morbidity among the target population.
Health management information system	A monthly reporting system for diseases, conditions, and risks that is reported to the MOH from every healthcare facility electronically or on paper
Human-animal and environment	A continuum of contacts and interactions among people, animals, their products, facilitating transmission of zoonotic interface pathogens or shared health threats
Incident	An occurrence or event, natural or human-caused, that requires an emergency response to protect life, property, or the environment. An incident may be geographically confined (for example, within a clearly delineated site or sites) or dispersed (for instance, a widespread power outage or an epidemic). Incidents may start suddenly (for example, a chemical plant explosion) or gradually (a drought). They may be of very short duration (for example, a call for emergency medical assistance), or continue for months or even years. War-related disasters, public health and medical emergencies, and other emergencies
Incident Management System (IMS)	This is a standardised approach to emergency management, encompassing personnel, facilities, equipment, procedures, and communications operating within a common organisational structure.

International Health Regulations (2005)	International legal instrument that is binding in 196 countries. The regulations aim to help the international community prevent and respond to acute public health risks that have the potential to cross borders and threaten people worldwide
Multisectoral	Participation of more than one sector working together on a joint programme or response to an event (for example, a joint investigation by public health and law enforcement)
One Health	An approach to address a shared health threat at the human-animal-environment interface, based on collaboration, communication, and coordination across all relevant sectors and disciplines, with the ultimate goal of achieving optimal health outcomes for both people and animals. A One Health approach applies to the local, regional, national and global levels
Outbreak	The occurrence of more cases of diseases, conditions or events than expected in a defined geographical area and time
Pandemic	An epidemic occurring worldwide, or over a very wide area, crossing international borders and usually affecting a large number of people
Point of entry	Any passage, via land, air or sea, for international entry or exit of travellers, baggage, cargo, containers, conveyances, goods and postal parcels as well as agencies and areas providing services to them on entry or exit
Reporting site	A site which reports about surveillance and outbreak data to the LGA level. A reporting site includes all health facilities (public, private and quasi-governmental, faith based), standalone laboratories and points of entry. A reporting site also contains event reports from community surveillance and response
Zoonotic disease or zoonosis	An infectious disease that can be spread between animals and people

FOREWORD

Communicable diseases are the most common causes of illness, disability and death in most developing countries. These include malaria, measles, cerebrospinal meningitis, cholera, yellow fever, Lassa fever, Tuberculosis, HIV/AIDS, pneumonia etc.

The Federal Ministry of Health (FMOH) has developed programmes for the elimination, eradication, prevention and control of these diseases. Importantly, the Nigeria Centre for Disease Control (NCDC) was established by Act in November 2018 as an agency of FMOH, to lead the prevention, preparedness, detection and response to communicable diseases.

While communicable diseases remain a challenge in Nigeria, the country has also recorded an increase in the burden of non-communicable diseases. This further highlights the need to utilise surveillance data for effective control.

Disease surveillance is critical in helping countries monitor and evaluate emerging patterns and trends of disease. The resultant effect of poor surveillance systems in countries, is poor control measures which results in high mortality, morbidity and disability.

characterisedThe World Health Regional Committees for Africa advocated for the adoption of IDSR in 1998 at its 48th session. The aim of this strategy is to integrate multiple surveillance systems so that human and other resources can be used more efficiently and effectively.

Due to gaps identified in the IDSR strategy, in 2008, the WHO advocated for a review of the strategy and came up with the first generic version of the revised national technical guidelines on IDSR which was adapted by all countries in the African region including Nigeria. The 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 the IDSR Technical Guidelines (2002) was adopted and adapted by Nigeria. Following this, tremendous progress has been made in establishing a well-coordinated and integrated surveillance system in the country. Capacities have also been built across all the levels to detect, confirm and respond to public health threats.

The second version of the IDSR Technical Guidelines was developed in response to several factors relevant to the last decade. In the last ten years, many changes have occurred in Africa's health, social, economic, environmental and technical environment. Between 2000 and 2019 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 Departments and Agencies within the Federal Ministry of Health, Tertiary and Specialist Hospitals, States Ministry of Health, LGAs, academia 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 an all-encompassing document for disease surveillance and response.

I recognise the efforts of NCDC in coordinating the review of Nigeria's surveillance and response strategy. I am confident that this review will lead to the improvement of our health security in Nigeria.

DR. OSAGIE EHANIRE

HONOURABLE MINISTER OF HEALTH

ACKNOWLEDGEMENTS

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

The purpose of revising these IDSR technical guidelines was to:

(a) Align with the current situation and needs of the Member States.

(b) Align with the objectives, targets and elements of the WHO Africa Region's strategy for health security and emergencies 2016–2020.

(c) Update the guidelines with contemporary information, taking into consideration new developments such as: emerging and re-emerging priority diseases, conditions and events.

(d) Incorporate recent recommendations from expert panels on strengthening the IHR, 2005 that are underpinned on the One Health approach.

(e) Holistically address disaster risk management (DRM) strategies.

(f) Take into account lessons learnt from the unprecedented EVD outbreak in West Africa, polio eradication and other humanitarian crises.

(g) Take advantage of technology advancement and utilize the opportunities offered by the internet and mobile phones to scale up the implementation of real time community event-based surveillance (CEBS), with robust geographical information system (GIS) platforms.

(h) Scale up other electronic surveillance systems and incorporate new ways for capacity building using the IDSR eLearning tools

The final draft was peer reviewed by the ad hoc task force as well as during a final partner consultative meeting held in March 2018.

In Nigeria, the adaptation of this technical guidelines involved input from ******

OVERVIEW OF THE THIRD EDITION

The previous edition of the guidelines has been revised in order to incorporate lessons learnt from previous epidemics, new frameworks or strategies, such as the strategy for health security and emergencies, the revised IHR monitoring and evaluation framework, the initiatives for enhancing prevention, detection and response to public health events (GHSA, One Health, DRM), key regional strategies and rising non-communicable disease threats and road traffic injuries in the context of development of resilient health systems. The revised guidelines also aim to address implementation of the IHR (2005) requirements and capacities for surveillance and response. These guidelines are adapted to reflect national priorities, policies and public health structures, and used in conjunction with other similar guidelines/strategies or initiatives. Overall, the revised guidelines have incorporated the following:

(a) Strengthening indicator-based surveillance with better analysis, reporting and use of routine data for decision making

(b) Strengthening event-based surveillance

(c) Improving community-based surveillance

(d) Improving cross-border surveillance and response

(e) Scaling up e-IDSR implementation

(f) Improving reporting and information sharing platforms

(g) Sharing improved data between sectors

(h) Tailoring IDSR to emergency or fragile health system contexts

(i) Establishing Public Health Emergency Operation Centre (PHEOC)

(j) Revised list of priority diseases

The guidelines are intended for use as:

(a) A general reference for surveillance activities across all levels

(b) A set of definitions for thresholds that trigger some action for responding to specific diseases or conditions

(c) A stand-alone reference for level-specific guidelines

(d) A resource for developing training, supervision and evaluation of surveillance activities

(e) A guide for improving early detection and preparedness for outbreak response

These guidelines are to be used by health care workers at all health care levels (public and private), where illness is presented for the first time. Additionally, this document should be used by:

(a) Disease surveillance managers and officers at all levels
(b) IHR national focal points
(c) Health authority at point of entry
(d) Hospital managers, clinicians and infection control officers
(e) National laboratory directorates
(f) Veterinary and wildlife health officers
(g) Environmental health officers and sanitarians
(h) Local Government Areas (LGA) health management teams
(i) Physician assistants/clinical officers
(j) Public health staff
(k) Medical doctors
(l) Nurses
(m) Pharmacists
(n) Health facility managers
(o) Medical and nursing educators
(p) Other health educators
(q) Communication officers
(r) Logisticians
(s) Laboratory personnel
(t) Community leaders, ward leaders, councilors and LGA/state political officers
(u) Other public health experts and practitioners in specialised institutions
(v) Public health training institutions
(w) Other health partners including NGOs
(x) Statisticians and data managers
(y) Other Ministries Departments and Agencies (MDAs)

Introduction

Introduction

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 Organisation 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 (VPDs) 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 proportions 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 1.5% (2018). In 2006, the country experienced outbreak of highly pathogenic Avian Influenza (H5N1) in poultry and in 2007, a human case was recorded.[2]

In September 1998, the 48th World Health Organisation 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 were targeted for eradication, elimination, epidemic prone and some communicable diseases of public health importance.

With the epidemiologic transition, non-communicable diseases now contribute a significant burden of morbidity and mortality in Africa. Nigeria, like other developing countries, is facing a double burden of both communicable diseases and Non-Communicable Diseases (NCDs). This guideline was revised to include emerging and re-emerging diseases and conditions such as monkeypox, Congenital Rubella Syndrome (CRS) and dog bite (Rabies).

On 23rd of May 2005, the 58th 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]

This IDSR guideline is developed to guide the collection, collation, analysis and communication of data for diseases of public health importance in Nigeria. This is to ensure that data is collected and used for public health action.

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 recognised as an important component of public health surveillance

Several types of surveillance are used in national programmes. 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, it is important that data is used for public health action.

What is Integrated Disease Surveillance and Response?

The concept of Integrated Disease Surveillance and Response (IDSR), which incorporates indicator-based and event-based surveillance as integral parts of an Early Warning, Alert and Response System (EWARS). This section also provides guidance on how IDSR works, its objectives, and how it can help to build and sustain the International Health Regulation (IHR) core capacities, thereby facilitating its implementation.

The section introduces other aspects such as: the One Health approach; the linkage between Disaster Risk Management and IDSR; the core surveillance functions; how the subnational level - for example Local Government Areas (LGAs) can use these guidelines to strengthen surveillance and response; the roles and responsibilities of the various actors at different levels; and the priority diseases, conditions and events recommended in IDSR.

The IDSR is a strategy and a tool to promote rational use of resources by integrating and streamlining common surveillance activities. Many intervention programmes still rely on their own disease surveillance systems. Each programme 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 Organisation (WHO) Regional Office for Africa (AFRO) recommends 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 Health** perspective which is a strategy that addresses events at the intersection of human, domestic animal, wildlife, and the environment.

It is important to emphasise from the outset that these guidelines are to help build and strengthen surveillance systems for priority diseases, conditions and all other public health events, whether they are known or unknown, whether they are disease, events or other IHR hazards. These guidelines are NOT limited to only known diseases.

Efforts to Strengthen IDSR in Nigeria

By virtue of its Act, NCDC is providing leadership for the surveillance of infectious diseases in Nigeria through the development of guidelines, protocols, surveillance systems, training of personnel at various levels, sharing of public health information and other aactivities.

Public Health Surveillance

Public Health Surveillance is the ongoing systematic identification, collection, collation, analysis and interpretation of disease occurrence and public health event data, for the purposes of taking timely and robust action, such as disseminating the resulting information to the relevant people, for effective and appropriate action. Surveillance is also essential for planning, implementation, monitoring and evaluation of public health practice. Nigeria has decided to achieve its public health surveillance objectives through the implementation of the adapted WHO AFRO IDSR strategy.

Definition of the Different Types/Approaches of Public Health Surveillance

Types of Surveillance Systems

(a) **Active surveillance:** It involves an ongoing search for cases in the community or health facilities. This may involve regular contacts with key reporting sources1, by making telephone calls to health care workers at a facility or laboratory or physically moving to the source and carrying out record review of data. Examples include visiting homes to identify cases of measles or yellow fever during an outbreak. Active case search is critical as part of outbreak response

(b) **Passive surveillance:** A system whereby a health institution receives routine reports submitted from health facilities, such as hospitals, clinics and public health units, the community or other sources. This is the most common form of surveillance, which includes the surveillance of diseases and other public health events using routine surveillance; routine health management and information system or any other public health information system. .

Surveillance Approaches

Integrated Disease Surveillance and Response: : It is an approach that aims at collecting health data for multiple diseases, using standardised tools. To ensure robust early warning and prompt response, the IDSR data collection and analysis system relies on two main channels of information or signal generation: indicator-based surveillance (IBS) and event-based surveillance (EBS).

Indicator-based Surveillance

Indicator-based surveillance is the systematic (regular) identification, collection, monitoring, analysis and interpretation of structured data, such as indicators produced by well-identified, mostly health-based formal sources.

Common methods of indicator based surveillance are case-based which is usually used for epidemic prone diseases, sentinel surveillance which is usually used for specific conditions in a specific cohort, syndromic surveillance which is done using standard case definitions, disease based surveillance, community based surveillance etc.

Event-based Surveillance

Event-based surveillance is the organised and rapid capture of information about events that are of potential risk to public health. Information is initially captured as an alert, considered by the early warning and response system as representing a potential acute risk (such as an outbreak) to human health. All alerts may not necessarily become real events, and as such, need to be triaged and verified before a response is initiated. Alerts which may signify potential risks include:

Event-based surveillance also involves media monitoring, which entails regular scanning of newspapers, internet sites and media alert systems, such as ProMed, blogs, social media, radio, and television etc.

The event-based surveillance system is very sensitive, and information received through it should be synchronised with IBS and rapidly assessed for the risk the event poses to public health and responded to appropriately (illustrated in Figure 1).

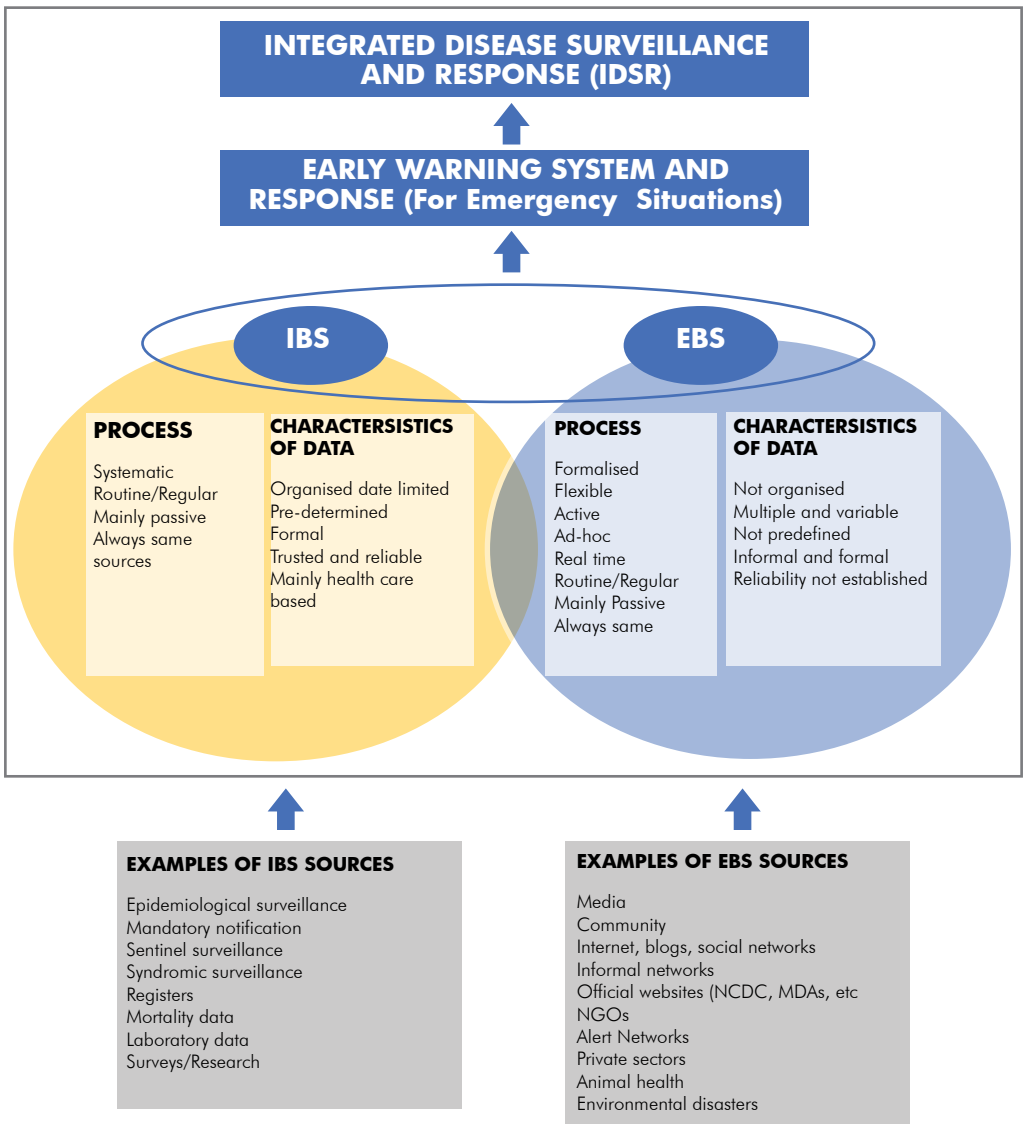

Figure 1: Indicator-based and event-based surveillance for IDSR Strategy

Intersection of IBS and EBS: All events detected in the EBS system that are investigated and meet the standard case definition should be captured in the IBS system and reported to the next level of the health care system.

Early Warning, Alert and Response System

This is a simple robust system designed to improve disease outbreak detection in emergency settings such as during conflict or following a natural disaster. This can enable rapid detection and response to outbreak signals.

Unlike indicator-based surveillance, event-based surveillance is not based on the routine monitoring of indicators and automated thresholds for action, but rather on the screening of all available information to detect any event happening in the community (unusual disease or deaths in humans or animals, and unusual or clustering of cases, events/conditions in the community, including environmental conditions).

Event-based Surveillance And Indicator-Based Surveillance as Backbone to the IDSR Strategy

Event-based surveillance and indicator-based surveillance are components of the early warning and response and epidemic intelligence, incorporated into the IDSR strategy. EBS and IBS complement each other, albeit with separate roles and purposes. EBS is most likely to pick up alerts to detect small outbreaks early, while IBS is better at monitoring disease trends overtime, and useful for signaling the start of regular seasonal outbreaks of endemic diseases, using alert and epidemic thresholds. IBS may not be useful for smaller events because they are either averaged out in large data sets or lost in smaller data sets. EBS is also better at picking up alerts indicating outbreaks in areas where access to healthcare is limited. In the context of IDSR strategy, the flow of EBS information follows the same reporting lines as IBS, that is from community to ward/LGA, to state and to national level. EBS and IBS are applied at all levels of the health system - community, health facility, LGA, state and national (illustrated in figure 2).

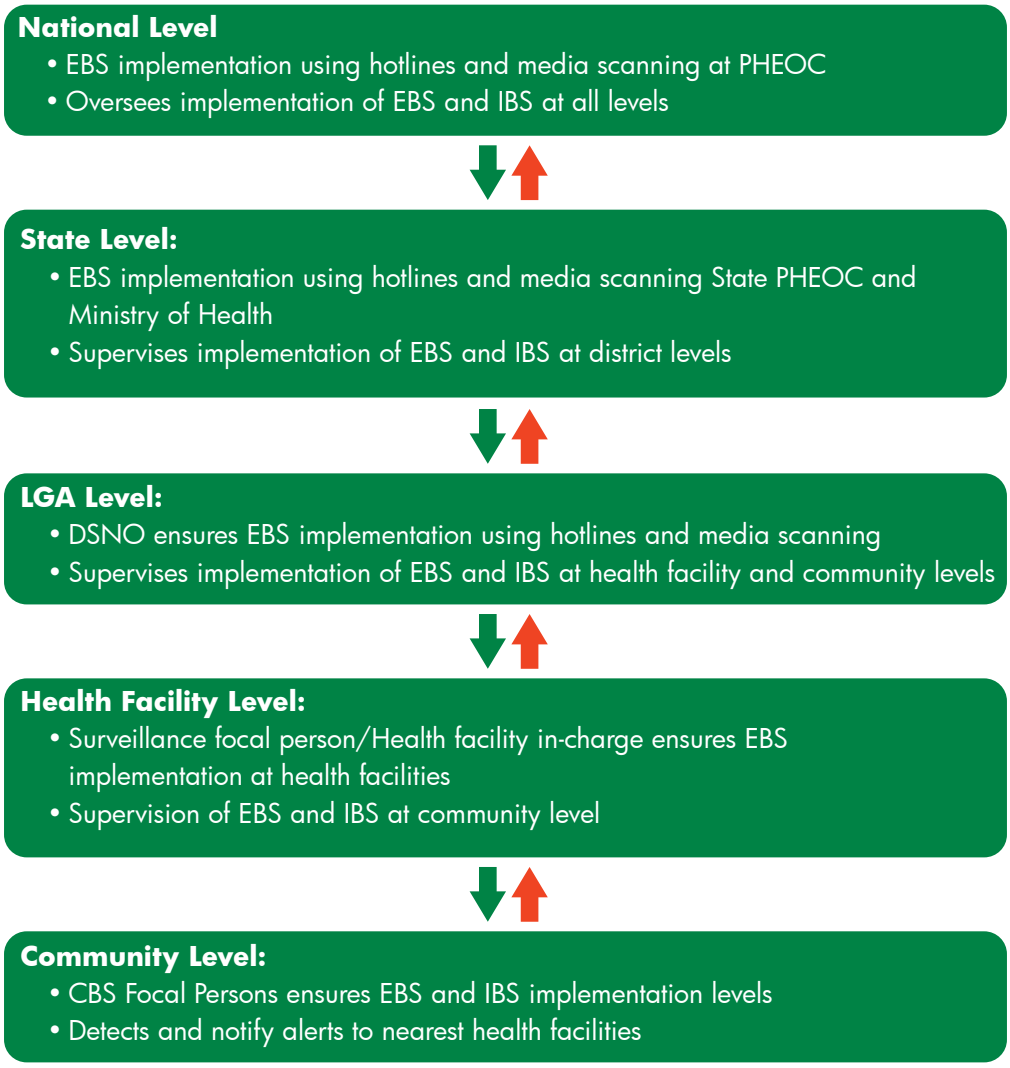

Figure 2: Levels of application and reporting of EBS and IBS in the context of IDSR

IBS and EBS are complementary sources of information, and both contribute to the early warning function, critical for a prompt and proportioned response. The two are not necessarily separate surveillance systems; both are processed through a single activity and some of the surveillance functions might be common to both types.

Integrated Disease Surveillance and Response Strategy

The Integrated Disease Surveillance and Response (IDSR) strategy was adopted by WHO/AFRO Member States in September 1998 as the approach for improving public health surveillance and response for priority diseases, conditions and events at community, health facility, LGA and national levels. IDSR promotes rational and efficient use of resources by integrating and streamlining common surveillance activities and functions.

Surveillance activities for different diseases involve similar functions (detection, sample collection, reporting, analysis and interpretation, feedback, and action), and often use the same structures, processes and personnel. As such, the principles of surveillance are the same whether applied to a single disease, condition or event or multiple diseases. What may differ is whether the target is elimination or eradication, which may require time-limited intensive efforts aimed at proving the absence of disease.

Integration refers to the efficient use of human resources, and harmonising different methods, software, data collection forms, standards and case definitions in order to prevent inconsistent information and maximise efforts among all disease prevention and control programmes and stakeholders. IDSR involves full-time coordination of surveillance activities and joint action (planning, implementation, monitoring and evaluation), whenever possible and useful.

To facilitate coordination and collaboration, a national, state and LGA multisectoral, multidisciplinary coordination body, the Epidemic Preparedness and Response committee (EPRC) is formed to coordinate surveillance activities in close collaboration or synergy with the committee set up for epidemic response (See chapter 5 of these guidelines). In Nigeria, NCDC has the mandate to coordinate the surveillance of communicable diseases (NCDC Act, 2018).

What Takes Place in an Integrated System?

a All surveillance activities are coordinated and streamlined. Rather than using scarce resources to maintain multiple surveillance systems with separate vertical activities, resources are combined to collect, manage and analyse information at a single focal point at each level.

b. 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) often address surveillance for neonatal tetanus, measles and other vaccine preventable diseases (VPDs) or any unusual events. Thus, health workers who routinely visit health facilities to search for AFP cases also review LGA and health facility records for information about other priority diseases in the area.

c The LGA level is the hub and focus for integrating surveillance functions. It is the first level in the local health system. It has dedicated staff for all aspects of public health, such as planning, supporting implementation of the National Health Strategic Plan (NHSP), monitoring health events in the health facility and the community, mobilising community action, seeking assistance at the national level, and accessing regional resources for protecting at the LGA level. Similar functions also occur at the various administrative levels.

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

e. The focus is on the creation of an overall public health surveillance system with sufficient capacity for detecting, confirming and responding to diseases, conditions and events. IDSR ensures that the information flow is bi-directional (horizontal and vertical), so that each level is informed promptly of potential outbreaks and response interventions. Information flow should also reach adjoining communities and LGAs.

Objectives of Integrated Disease Surveillance and Response

General Objective

To improve the country's ability to detect, report,confirm and effectively respond to high-priority communicable and non communicable diseases including other health conditions and events.

Specific Objectives

a. To strengthen the capacity to conduct effective surveillance activities at all levels; train personnel, develop and carry out plans of action, advocate and mobilise resources

b. To increase involvement of clinicians and other cadres of health staff in surveillance activities

c. To integrate multiple surveillance systems so that tools, personnel and resources are used more efficiently

d. To improve the triangulation and use of information to detect changes in trend in order to conduct a rapid response to suspected and confirmed outbreaks; monitor the impact of interventions (for example, declining incidence, spread, and case fatality); and facilitate evidence-based response to public health events, health policy design, planning and management.

e. To improve the flow of surveillance information between and within levels of the health system, using electronic tools

f. To build strong laboratory systems and networks at national, states and LGA levels, to confirm pathogens and other hazards, monitor drug sensitivity and increase efficacy of point-of-care tests

g. To trigger epidemiological investigations of reported public health problems and implementation of effective public health interventions

h. To mount an effective response to public health emergencies

i. To emphasise community participation in the detection, reporting and response to public health problems, including indicator-based and event-based surveillance and response and risk communication in line with International Health Regulations (IHR).

Core Functions of IDSR

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

Step 1: Identify and record cases, conditions and events.

Step 2: Report suspected cases, conditions or events to the next level for action.

Step 3: Analyse (person, place and time) and interprete findings.

Step 4: Investigate and confirm suspected cases, outbreaks or events.
Step 5: Prepare.

Step 6: Respond.

Step 7: Risk communication.

Step 8: Monitor, evaluate, supervise and provide feedback to improve the surveillance system.

Different Levels Where Surveillance Activities are Performed

The levels are defined as follows:

Community – Basic community-level surveillance services provided by trained birth attendants, community or village health agents, Community Health Influencers and Promoters (CHIPs) or similar care providers, village or community leaders (religious, traditional or political) or school teachers, health extension workers, locally identified community-based surveillance volunteers, veterinarians, Patent Medicine Vendors and traditional healers.

Health facility – For surveillance purposes, all tertiary, secondary, primary institutions (public, private), NGOs or Faith-Based Organizations (FBOs) with outpatient and/or inpatient facilities are defined as health facilities.

LGA – For surveillance purposes at the LGA level, the LGA DSNOs, health educator, medical officers of health/ PHC coordinator, counsellors for health carry out vital roles in surveillance

State – The State Epidemiologist, State DSNO, Director of Public Health at the State Ministry of Health and other personnel play vital roles in surveillance

National Level – NCDC coordinates surveillance activities for communicable diseases in collaboration with FMOH, NPHCDA, and other relevant stakeholders and partners.

In an integrated system, some laboratory services are available at each level described above.

How to Strengthen Surveillance and Response Using the IDSR Matrix

All levels of surveillance system should use a matrix of IDSR functions and skills to describe their role. Such a matrix 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 an IDSR system under development, the matrix provides a systematic framework for improving and strengthening the system.

Practical uses of the IDSR matrix include:

(a) Ensuring that all necessary functions and capacities have been identified

(b) Establishing accountability to provide a basis for assigning functions to appropriate levels and determining what capacities should be present

(c) Organising activities and training for human resource development

(d) Managing, monitoring and evaluating programmes

(e) Strengthening laboratory capacity, including laboratory information system

(f) Planning for resources (human, material/supplies and financial).

The IDSR matrix also illustrates several key assumptions that need to occur for the core functions of the surveillance system. If one or more of the elements at each level is not present or is being performed poorly, the risk of failure increases for the achievement of surveillance and control objectives. An effective system should be supported at all levels from the levels above and below. A complete surveillance system minimises delay in taking public health actions.

The functions of detection, reporting, analysis, investigation, response, risk communication, monitoring and evaluation and providing feedback are interdependent and should always be linked. The IDSR matrix in Annex A, defines the surveillance functions and how they are achieved at each level of the health system including the role of WHO in relation to IDSR core functions

Modes of Data Collection

Both paper-based and electronic IDSR (e-IDSR) are being used for data collection. Electronic IDSR is the application of electronic tools to the principles of IDSR, to facilitate prevention, prediction, detection, reporting and response.

Electronic IDSR (eIDSR) as a Platform for Enhancing Real Time Surveillance

The application of e-tools in the health sector has the potential to provide real-time validated data for public health surveillance, investigation and prompt outbreak response. Electronic IDSR provides new opportunities for accelerating the achievement of the IHR (2005) core capacities.

While paper-based tools can provide timely information, Nigeria is transitioning into full electronic reporting platforms (the Surveillance Outbreak Response Management Analysis Systems (SORMAS) and mobile strengthening epidemic response systems (mSERS) for real- time reporting. As at the time of development of this guideline, these platforms were being rolled out across all states. The electronic reporting platforms will facilitate timely data transmission and response to public health threats

IDSR and IHR (2005)

The International Health Regulations (2005) is a binding and legal instrument, which urges all States parties to develop minimum core public health capacities.

IHR (2005) Purpose and Goal

The purpose of the IHR (2005) is to prevent, protect against, control and provide public health response to the international spread of disease in ways that are relevant and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade.

IDSR provides the following resources for the implementation of IHR (2005):

a. An infrastructure for surveillance, investigation, confirmation, reporting and response

b. Skilled human resources

c. Defined implementation processes (sensitisation, assessment, plan of action, implementation, monitoring and evaluation)

d. Generic guides for assessment, plan of action development, technical guidelines training materials, tools and Standard Operating Procedures (SOP) that incorporate IHR (2005) components.

IDSR and IHR (2005) share common functions, as described in figure 3 below (detection, notification, reporting, verification and confirmation, and timely response).

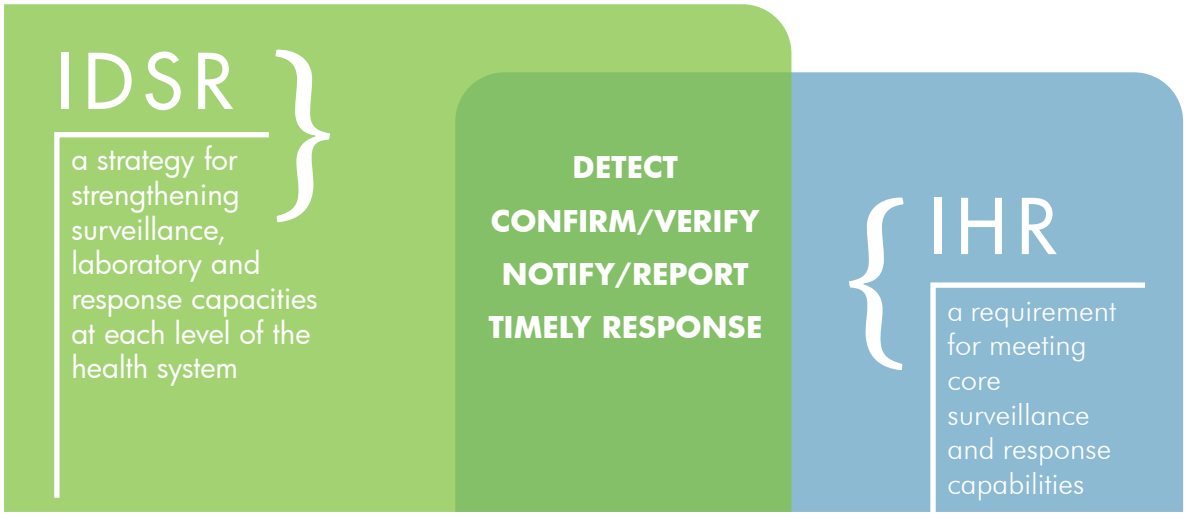

Figure 3: Implementing IHR through IDSR[1]

The IHR (2005) guidelines have practical implications for IDSR. In the IHR (2005) guidelines, all PHEICs should be detected, assessed and responded to promptly, using an adapted response rather than pre-set measures. The IHR (2005) guidelines include the measures at Points of Entry (PoE) - airports, ports and ground crossings and containment at source of public health events. The IHR (2005) guidelines also include capturing signals of "unexplained illness or clusters" as an event category for reporting from lower levels. Because of the major role IHR (2005) plays for timely detection and verification of suspected public health emergencies and events, event-based surveillance is now part of IDSR and the IHR.

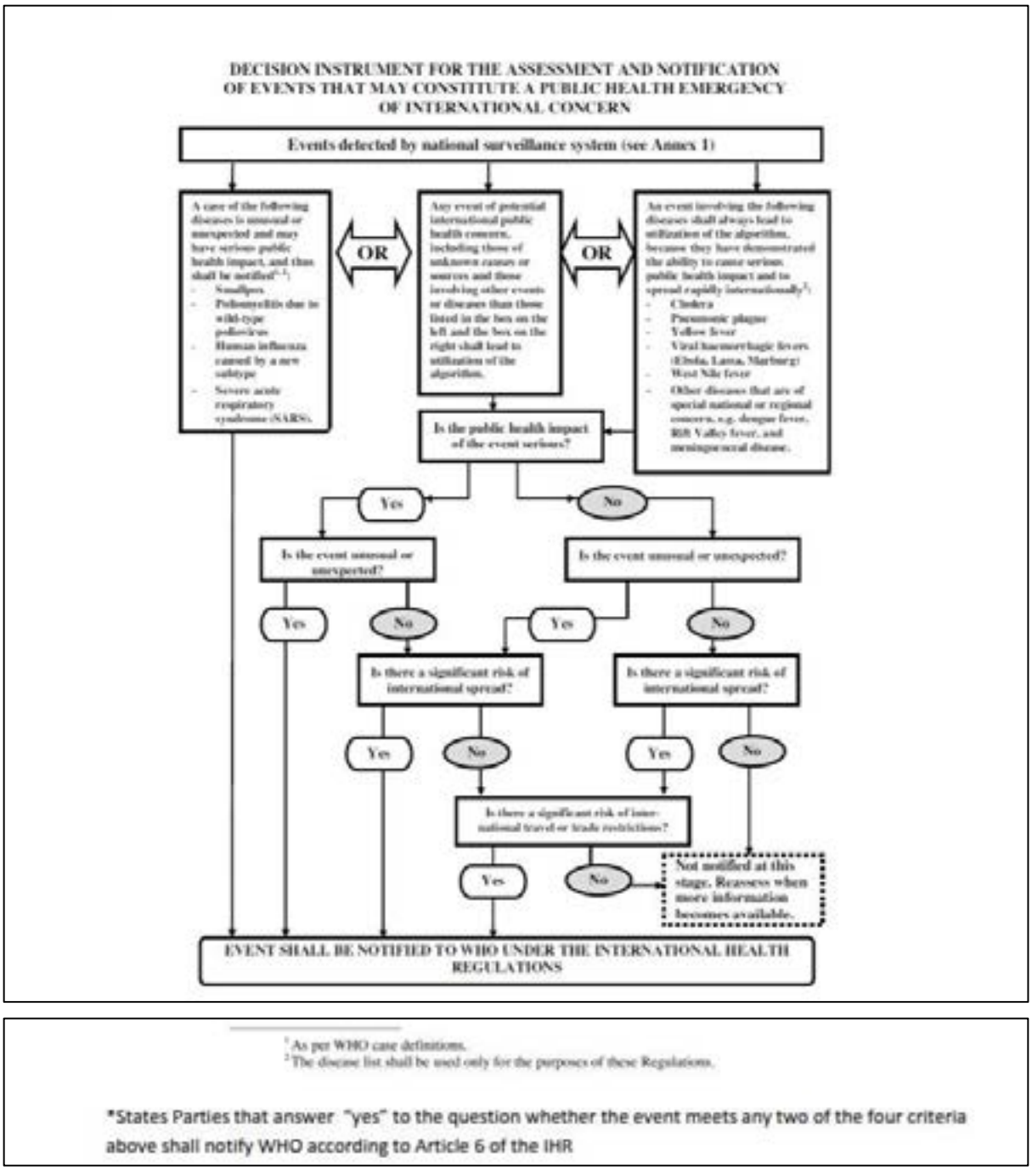

Figure 5: IHR (2005) decision instrument

Events of Potential International Health Concern Requiring Reporting to WHO Under IHR (2005)

1. Infectious Disease Hazards

Known, new and unknown infectious disease threats

2. Zoonotic Disease Events

Detecting diseases that affect animals is important, as they may pose a risk to human health and could save lives.

3. Food Safety Events

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

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.*

One Health and IDSR

One Health is an approach to address a shared health threat at the human-animal-environment interface, based on collaboration, communication and coordination across all relevant sectors and disciplines, with the ultimate goal of achieving optimal health outcomes for humans and animals alike. The One Health approach applies to the local, regional, national, and global levels. Humans and animals (domestic and wildlife) share the same eco-system and opportunities for spillover of diseases are increasing with modern trends in globalisation, growing population pressures, climate change, economic development, mass urbanisation and increasing demand for animal-sourced foods2 (https://www.cdc.gov/onehealth/basics/history/index.html)

The One Health approach is intrinsic to and strongly reinforced by WHO's IHR (2005) and the IDSR strategy, as well as other global health frameworks. It is meant to improve indicator and event based surveillance, which is the cornerstone of the early warning function of the IDSR. Animal and human health workers as well as other relevant partners should be engaged at various levels, as information sources for IDSR, to further facilitate information sharing and joint rapid response activities.

A strong functional IDSR/IHR thus requires improved communication, strong One Health workforce, prioritisation of zoonotic diseases of public health importance, development of One Health strategic plan, coordination and collaboration from all sectors, for the implementation of an effective One Health framework.

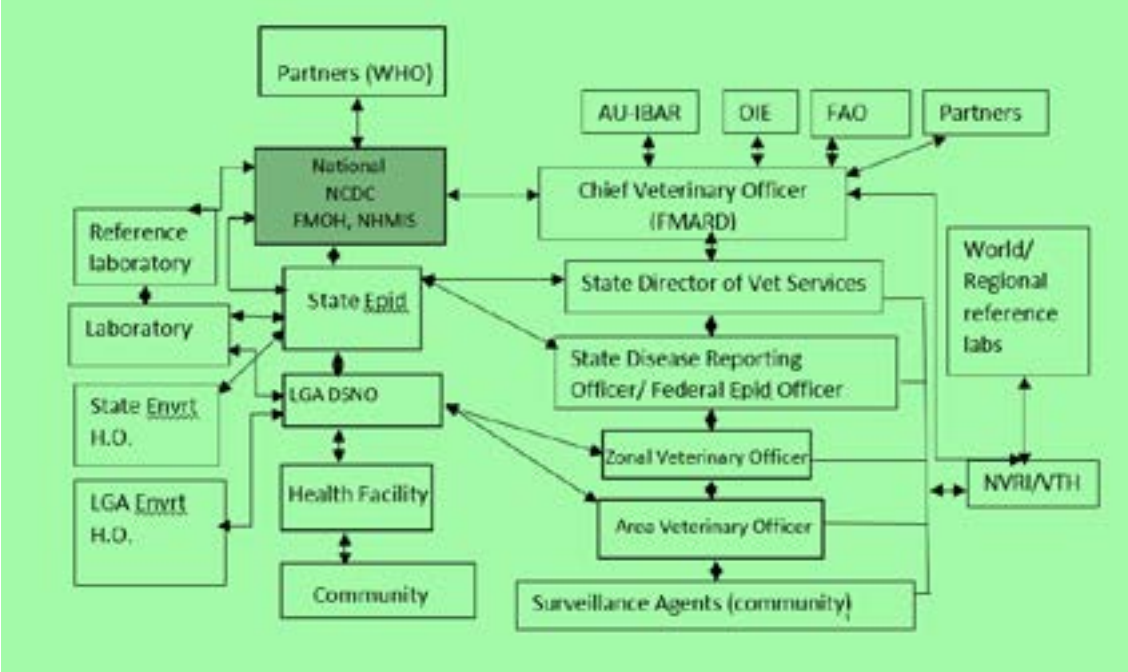

Figure 6: Reporting and Information System sharing for Human, Animal and Environment Sectors [1]

[1]*Envrt H.O. – Environment health officers, State Epid- State epidemiologists, NVRI- National Veterinary Research Institute, VTH- Veterinary Teaching Hospital*

Implementing Cross-Border Activities in the Context of IDSR

Given the ecological distribution of communicable diseases and the porosuity of international borders, it is imperative that countries in the region work together to control and contain the spread of these diseases. The free movement of people and goods across the Nigeria's borders provides opportunities for cross-border spread of diseases. In addition, for urban areas located at border points, a disaster on one side of the border can easily affect the health of a large number of people on both sides of the border. It is therefore logical that Nigeria and her neighbouring countries (Republic of Benin, Chad, Cameroon, Niger and Equatorial Guinea) should coordinate and synchronise interventions, in an effort to control the spread of communicable diseases. Developing a cross-border framework has provided an opportunity for Nigeria to initiate and boost priority cross-border activities for disease control, including, but not limited to, disease surveillance, epidemic preparedness and outbreak control, as well as building core capacities to ensure compliance with IHR (2005).

In implementing cross-border activities in the context of IDSR it is important to:

(a) Collaborate with WHO in the established cross-border surveillance and response framework with neighbouring countries using the existing IDSR systems in the respective countries.

(b) Maintain the established procedures for data sharing within the framework of IDSR

(c) Notify neighbouring cross-border areas and LGAs when outbreaks are detected through the IDSR system, using the IDSR reporting tools. If they are reporting a similar outbreak, coordinate response efforts with the IDSR response structures as described in Sections 4, 5 and 6.

(d) Ensure cross-border (LGA to LGA/District) coordination and collaboration on surveillance issues and provide notification of any outbreaks in the neighbouring LGA. International or cross-border notification should also be given if needed.

(e) Develop and organise simulation exercises with cross-border LGA/District teams.

(f) Organise regular cross-border meetings.

(g) Ensure political leaders assist LGAs to facilitate cross-border LGA surveillance and response initiatives.

IDSR and Disaster Risk Management

Disaster is defined as the serious disruption of the functioning of a community or society, causing widespread human, material, economic or environmental losses, exceeding the ability of the affected community or society to cope, using its own resources. At its sixty-second session held in November 2012 in Luanda, the Regional Committee for Africa adopted a paper entitled "Disaster risk management: a strategy for the health sector in the African Region", in an effort to adopt a comprehensive approach to tackling disaster risk management.

Disaster risk management (DRM) is defined as the systematic process of using administrative and organizational directives, operational skills and capacities to implement strategies, policies and improved coping capacities, thereby lessening the adverse impact of hazards and possibility of disaster. In DRM, a hazard analysis is conducted, followed by an assessment of the level of vulnerability and available coping capacity. The ultimate objective of DRM is to lower risk by reducing vulnerability or improving the capacity to mitigate the impact of a hazard. IDSR is an important tool in the DRM, as it provides early warning information, which is crucial for risk assessment and ultimately, risk reduction. IDSR assists in identification of hazards, assessment, communication and monitoring of risks, thereby enhancing the early warning component.

Priority Diseases, Conditions and Events Include in the IDSR

Nigeria has adopted the following communicable and non-communicable diseases and conditions or events as priorities for integrated disease surveillance (see Table 1 for the priority diseases, conditions and events). The diseases or conditions are recommended because they are:

a. Required internationally under IHR for example, smallpox, poliomyelitis due to wild-type poliovirus, human influenza caused by a new subtype, Severe Acute Respiratory Syndrome (SARS)

b. Diseases with highly epidemic potential to cause serious public health impact due to their ability to spread rapidly internationally (for example, cholera, plague, yellow fever, viral haemorrhagic fever)

c. Principal causes of morbidity and mortality due to communicable diseases and conditions in the country (for example, malaria, pneumonia, diarrhoeal diseases, tuberculosis, HIV/AIDS, maternal deaths and injuries)
d. Priority non-communicable diseases or conditions in the country (hypertension, diabetes mellitus, cancer, mental health and malnutrition).

Effective control and prevention interventions are available for addressing the public health problems they pose e.g onchocerciasis, Human African Trypanosomiasis (HAT). Intervention programmes supported by WHO for prevention and control, eradication or elimination of these diseases exist. These include the Expanded Programme on ImmunisationImmunisation (EPI), the Integrated Management of Childhood Illness (IMCI) etc.

These IDSR priority diseases, conditions and events call for special reporting requirements, which are different from other routine reporting mechanisms for other diseases. Section 2, on reporting priority diseases, conditions and events, sheds more light on how to report priority diseases and conditions.

DISEASE CLASSIFICATION				
S/N	**Epidemic Prone Disease**	**Diseases targeted for eradication & elimination**	**Other Diseases of Public health concern**	**Unusual events for immediate reporting**
1	Lassa fever	Buruli ulcer	Anthrax	Ebola
2	Yellow Fever	Dracunculiasis (Guinea Worm Disease)	Malaria	Anthrax
3	Bacteria Meningitis	Leprosy	Thyphoid fever	Chikungunya
4	COVID19	Lymphatic filariasis	Acute viral hepatitis	MERS
5	Cholera	Neonatal tetanus	Non-neonatal tetanus	Plague
6	Measles	Noma	Tuberculosis	Zika Virus
7	Monkeypox	Poliomyelitis	MDR/XDR Tuberculosis	Influenza due to new subtype
8	Dengue	Onchocerciasis	Any public health event of international or national concern (infectious, zoonotic, foodborne, chemical, radio nuclear, or due to unkown condition).	MDR/XDR Tuberculosis
9	Poliomelitis	Dog bites (Rabies)	Adverse events following immunisation (AEFI)	Unexplained cluster of illness/death from human or animal/bird
10	Diphteria	Trachoma	Diabetes mellitus (new cases)	Any disease or event of international concern
11	Pertusis	Yaws and endemic syphilis or bejel	Diarrhoea with dehydration less than 5 years of age	
12	Other viral Hemorrahgic Fever (e.g Ebola , Chinkunguya)		Epilepsy	
13	Rubela		Hypertension (new cases)	
14	Diarrhoea with Blood (Shigella)		Sickle cell disease(New Cases)	
15			Injuries (road traffic accidents)	
16			Malnutrition in children under 5 years of age	
17			Maternal deaths	
18			Perinatal deaths	
19			Severe pneumonia less than 5 years of age	
20			STIs	
21			Snake bite	

Annexes for Introduction

Annex A IDSR MATRIX: Core Functions and Activities by Health System

LEVELS	IDENTIFY	REPORT	ANALYSE AND INTERPRET	INVESTIGATE AND CONFIRM	PREPARE	RESPOND	COMMUNICATE RISK	MONITOR, EVALUATE, SUPERVISE AND PROVIDE FEEDBACK FOR IMPROVEMENT
COMMUNITY	Use alert triggers to identify priority diseases, events, conditions or other hazards in the community. Support community in case finding and promote use of alert triggers.	Report essential information on alert triggers to health care facility (HCF) and appropriate authorities	Involve local leaders in observing, describing and interpreting disease patterns, events, and trends in community Map community catchment area.	Support investigation activities. Follow up on rumours or unusual events reported by community leaders or members. Act as liaisons for feedback to community on follow-up actions.	Participate in community health and emergency preparedness committees. Participate in identifying potential diseases, conditions and events. Participate in training and simulation exercises.	Implement response activities. Encourage community participation Ensure that community seeks care immediately in case of emergency and signs of disease Participate in prevention and response-based activities Follow and model best practices in basic infection prevention and control measures and social distancing Carry out social research and conduct community health education for behavioural and communication change	Identify people who can ensure ownership of communication process Build relationship with nearby health facility for communication and coordination Liaise with healthcare facility Incorporate cross-sectoral communication with animal and environmental sectors to establish a One Health approach at the community level.	Verify community response to the public health action Give feedback to community members about reported cases, events, and prevention activities Verify if public health interventions took place as planned Participate in after-action reviews

Annex A IDSR MATRIX: Core Functions and Activities by Health System

	IDENTIFY	REPORT	ANALYSE AND INTERPRET	INVESTIGATE AND CONFIRM	PREPARE	RESPOND	COMMUNICATE RISK	MONITOR, EVALUATE, SUPERVISE AND PROVIDE FEEDBACK FOR IMPROVEMENT
HEALTH FACILITIES	Use standard case definitions to detect, laboratory confirm and record priority diseases or conditions Collect and transport specimens for laboratory confirmation Verify alert triggers from community Ensure appropriate storage of surveillance materials	Report case-based information for immediately reportable diseases Report weekly summary data to next level	Prepare and periodically update graphs, tables, and charts to describe time, person and place for reported diseases, events and conditions From the analysis, report immediately, any disease, event or condition that: • exceeds an action • threshold occurs in locations where it was previously absent • presents unusual trends or patterns	Take part in investigation of reported outbreaks Collect, package, store and transport specimens for laboratory confirmation during investigation	Participate in emergency preparedness and response committees Participate in response training and simulation exercises Monitor and maintain emergency response supplies	Participate in response activities, including case management and contact tracing according to the standard guidelines Take relevant additional control measures Participate as part of rapid response team	Ensure the communication system has a link to the community leadership structure Communicate with community members about outcome of prevention and response activities and maintain close contact with community Conduct regular listening sessions and meetings with CBS workers/volunteers about surveillance and response activities integrated with other health programmes	Assess community participation Conduct self-assessment on surveillance and response activities Monitor and evaluate prevention activities and modify them as needed Provide weekly summary data to community level Provide outcome of laboratory test to community-based surveillance workers/volunteers

Annex A IDSR MATRIX: Core Functions and Activities by Health System

	IDENTIFY	REPORT	ANALYSE AND INTERPRET	INVESTIGATE AND CONFIRM	PREPARE	RESPOND	COMMUNICATE RISK	MONITOR, EVALUATE, SUPERVISE AND PROVIDE FEEDBACK FOR IMPROVEMENT
LOCAL GOVERNMENT AREAS	Support HCF to verify alerts from community Collect surveillance data from HCF and the community and review the quality Ensure that reliable supply of data collection and reporting tools are available at reporting sites Ensure that all HCFs have materials for laboratory collection and transport	Ensure that HCF and community-based surveillance workers/ volunteers know and use standard case definitions for reporting priority diseases, conditions and events Maintain list of reporting sites Provide instructions and supervision for surveillance and reporting of priority diseases, conditions and events for HCF and communities Report data on time to the state/LGA surveillance officer	Aggregate data from HCF Use and refine denominators for rates Analyse data by time, place and person Assist HCF to update graphs, tables, and charts to describe reported diseases, conditions and events weekly Integrate epidemiological and laboratory data for better analysis Compare data and make conclusions about trends and thresholds	Support HCF to verify alerts from the community Arrange and lead investigation of verified cases or outbreaks Maintain an updated line list of suspected cases Assist HCF in safe collection, packaging, storage and transport of laboratory specimens for confirmatory testing Receive laboratory results from province/region and pass on to HCFs Report finding of initial investigation to Province/ Region	Establish and ensure functionality of the emergency preparedness and response committees Participate in risk mapping and community assessment Organize, establish and ensure functionality of LGA rapid response teams Participate in and support response training for HCF and community	Together with Province/ Region, select and implement appropriate public health response Plan timely community information and education activities Document response activities In case of outbreaks send daily LGA Sitrep	Establish risk communication systems and structure Ensure engagement of risk communication partners and stakeholders at regional level Develop an up-to-date risk communication plan and test during an actual emergency or simulation exercise Develop and build on relevant LGA stakeholder and organizational networks to improve information flow Ensure risk communication is part of the emergency response systems Alert and inform communities about outbreaks or events	Conduct regular supervisory visits of healthcare facilities Provide feedback to the HCF and community on surveillance activities and priority events Provide regular, periodic feedback to health care facilities and communities on routine control and prevention activities and outbreaks Monitor and evaluate programme timeliness and completeness of reporting from health facilities to the LGA Monitor and evaluate timeliness of response to outbreaks Gather information from affected communities on needs and impact of response Conduct LGA-level surveillance review meetings to include key community members and partners.

Annex A IDSR MATRIX: Core Functions and Activities by Health System

	IDENTIFY	REPORT	ANALYSE AND INTERPRET	INVESTIGATE AND CONFIRM	PREPARE	RESPOND	COMMUNICATE RISK	MONITOR, EVALUATE, SUPERVISE AND PROVIDE FEEDBACK FOR IMPROVEMENT
STATE	Ensure coordination with respective community units/departments to oversee and support community services and CBS with LGA Ensure that reliable supply of case definition posters, data collection and reporting tools are available at reporting sites Ensure that laboratory specimen collection and	Ensure that LGAs know and use standard case definitions for reporting and verifying priority diseases conditions and events Provide instructions and supervision for surveillance and reporting priority diseases, conditions and events for health care facilities and communities. Receive regular surveillance data from the LGA Surveillance Officer (DSO) and review the quality	Ensure accuracy of denominators for province/ region Aggregate data from DSO reports Analyse data by time, place and person Prepare weekly update graphs, tables, and charts to describe reported diseases, conditions and events Calculate rates and thresholds and compare current data with previous periods, to make conclusions	Arrange and support investigation of reported diseases conditions and events Receive and interpret laboratory results Compile LGA-level line lists of suspected cases Report the confirmed outbreak to national level Ensure that specimen collection kits for investigation activities are available	Convene emergency preparedness and management committee meetings Develop and manage contingency plans Conduct training and simulation exercises for staff Periodically conduct risk assessment for risk factors and potential diseases, conditions and events Organize and support Rapid Response Team	Select and implement appropriate public health response Activate epidemic preparedness and response committee and plan response Conduct training for emergency activities Plan timely community information and education activities Disseminate health education and behaviour change messages During epidemics send daily situation reports Activate Public Health Emergency Operation Centres during epidemics	Establish risk communication systems and structure Ensure engagement of risk communication partners and stakeholders by doing mapping Develop an up-to-date regional risk communication plan, and test during an actual emergency or simulation exercise Develop standard operation procedures (SOPs) covering clearance and release of a public health emergency information Ensure that regular update sources are accessible to the media and the public for information dissemination Ensure that accessible and relevant information, education and communication materials are tailored to the needs of the population	Monitor and evaluate programme targets and indicators for measuring quality of the surveillance system for LGAs and health care facilities Give feedback to LGAs on surveillance and data quality findings Give LGA regular, periodic feedback about routine control and prevention activities and outbreaks Produce monthly province/ region surveillance bulletin Provide regular assessment of staffing needs for IDSR implementation and inform the next level

Annex A IDSR MATRIX: Core Functions and Activities by Health System

	IDENTIFY	REPORT	ANALYSE AND INTERPRET	INVESTIGATE AND CONFIRM	PREPARE	RESPOND	COMMUNICATE RISK	MONITOR, EVALUATE, SUPERVISE AND PROVIDE FEEDBACK FOR IMPROVEMENT
STATES	transport material is available Track specimens for laboratory confirmation	Report data on time to the Nigeria Centre for Disease Control					Release information quickly in a transparent manner Ensure the use of evaluation to inform risk communication planning Ensure engagement of the public to facilitate peer-to-peer communication, create situational awareness, monitor and respond to rumours and public reactions to facilitate local level responses. Ensure that risk communication is part of the emergency response systems Ensure that trained personnel for risk communication are available across all levels Alert nearby areas and regions and LGAs about the outbreak, including cross-border areas	Conduct regular supervisory visits Monitor and evaluate timeliness of response to outbreaks and events Assess acceptability of response to community and refine as needed Ensure involvement of partners in monitoring surveillance and response activities Conduct province/ region-level surveillance review meetings to include key community members and partners

Annex A IDSR MATRIX: Core Functions and Activities by Health System

	IDENTIFY	REPORT	ANALYSE AND INTERPRET	INVESTIGATE AND CONFIRM	**PREPARE**	RESPOND	COMMUNICATE RISK	MONITOR, EVALUATE, SUPERVISE AND PROVIDE FEEDBACK FOR IMPROVEMENT
NATIONAL	Define and update national policy and guidelines and ensure compliance Set policies and procedures for the reference laboratory networks, including quality assurance systems Use reference laboratories for confirming, and specialized testing if necessary Collect and transport specimens for additional analysis at WHO collaborating centre (CC) as necessary	Train, inform and support lower levels on surveillance and response Aggregate province/ region reports of immediately reportable diseases and events Report other priority diseases, conditions and events on time, to relevant programmes and stakeholders Include all relevant laboratories in the reporting network Use IHR Decision Instrument to determine risks for priority diseases, conditions and events Inform WHO in line with IHR (2005)	Set policies and procedures for analysing and interpreting data Define denominators and ensure accuracy Analyse and interpret data from a national perspective for action Calculate national rates and compare current data with previous periods Describe risk factors for priority diseases, conditions and events Regularly convene a meeting of the technical coordinating committee to review the analysed and interpreted data before wider dissemination Carry out special analyses to forecast magnitude and trends of priority events	Ensure guidelines and standard operating procedures for outbreak investigations are available at all levels Deploy Rapid Response team for outbreak investigation and response Coordinate and collaborate with international authorities, as needed, during investigations Coordinate response with province/ region and LGA health teams, as needed, during investigations Alert and support laboratory participation Provide logistic support for the field investigation Share information with regional and international networks about confirmed outbreak Process specimens from investigation and send timely results	Set policies, procedures, and training for each level Undertake risk mapping Prepare and distribute emergency preparedness and response plans Develop national risk communication plan, including messages for community education Organize and support National Public Health Emergency Rapid Response Teams (RRTs) Develop and organize simulation exercises (including cross border) Develop and manage contingency plans Establish and ensure functionality of national public health emergency operations centre Monitor operational readiness using readiness checklist (Reference tool)	Set policies and procedures for responding to outbreaks of priority diseases, conditions and events Develop and support response activities that promote the psychology wellbeing of patients, health care workers, affected families and communities Coordinate response with province/ region and LGA health teams Support epidemic response and preparedness activities, including deployment of public health emergency RRTs Follow and adapt risk communication guidelines and social mobilization (Risk Communication Unit, NCDC) Activate Public Health Emergency Operations Centres	Establish risk communication systems and structure Ensure engagement of risk communication partners and stakeholders Develop an up-to-date risk communication plan and test during an actual emergency or simulation exercise Develop policies, SOPs and guidelines, covering clearance and release of information during a public health emergency Ensure that regular update information sources are made accessible to the media and the public for information dissemination Ensure that accessible and relevant information, education and communication materials are tailored to the needs of the population Release information quickly in a transparent manner Ensure use of evaluation to inform risk communication planning Develop and build on relevant stakeholder and organizational networks to improve information flow Ensure engagement of the public, to facilitate peer-to-peer communication, create situational awareness, monitor and respond to rumours and public reactions to facilitate local level responses. Ensure risk communication is part of the emergency response systems Ensure that trained personnel for risk communication are available across all levels	Monitor IDSR and laboratory core indicators regularly Give states/ LGAs regular feedback about routine and prevention control activities Share epidemiological data and reports, including outbreak response information with neighbouring countries Develop and periodically distribute national bulletin for epidemiology and public health Conduct IDSR regular review meetings Conduct regular supervisory visits Ensure involvement of partners in surveillance and response activities, AAR, including lessons learned from outbreak investigation and response Support annual monitoring of IHR core capacities Update and revise work plan and budget line for implementation of IDSR activities Document provision of appropriate and timely feedback

Annex A IDSR MATRIX: Core Functions and Activities by Health System

	IDENTIFY	REPORT	ANALYSE AND INTERPRET	INVESTIGATE AND CONFIRM	PREPARE	RESPOND	COMMUNICATE RISK	MONITOR, EVALUATE, SUPERVISE AND PROVIDE FEEDBACK FOR IMPROVEMENT
WHO country office, WHO AFRO REGIONAL OFFICE	Develop and disseminate generic guidelines for surveillance Encourage documentation and sharing of IDSR best practices Provide technical support to national level for detection and confirmation of priority diseases, conditions and events Coordinate international reference laboratory network support, including centres of excellence	Collect and compile reports of outbreaks and international notifiable diseases and events Produce annual regional profiles or situation reports by priority diseases, conditions and events	Provide guidance for better data analysis and development of bulletins/ information products Develop and disseminate best practices for analysis of data for each priority disease, condition and event Provide technical support to national level, to improve capacity for analysis	Disseminate updated guides and tools on specific diseases Provide support to countries to conduct assessments or investigations of priority diseases and events upon request Provide support for the coordination of laboratory participation during investigations Provide support for risk assessment using IHR decision instrument	Mobilize resources for training, logistics and supervision Set up network of experts for IDSR training and implementation Develop, update or revise guidelines for disaster or risk management Maintain and update a roster of experts for rapid response teams Develop, update/revise training for IDSR and IHR implementation Centre and support the Incident Management System.	Coordinate and support response activities (strategic health operations centre, technical experts, SOPs, guidelines, etc.) Mobilize resources and facilitate partnerships Support activation of the IMS team Activate the IMS team.	Disseminate risk communication guidelines, manuals, training modules and other forms of guidance related to risk communication Assist in coordination of partners and share information with partners and stakeholders	Provide feedback to aid collaboration with national and regional levels Post on the WHO website and disseminate relevant links to all individuals and partners Use reports from states to assess IDSR systems and advocate for improvements Develop, update or revise guidelines and tools for IDSR/ IHR monitoring and evaluation Develop and disseminate regional surveillance bulletin Promote, guide and support operational research Ensure functionality of the IDSR Task Force Regularly monitor the key performance indicators for IDSR and IHR and performance standard according to revised Emergency Response Framework

Annex A IDSR MATRIX: Core Functions and Activities by Health System

	IDENTIFY	REPORT	ANALYSE AND INTERPRET	INVESTIGATE AND CONFIRM	PREPARE	RESPOND	COMMUNICATE RISK	MONITOR, EVALUATE, SUPERVISE AND PROVIDE FEEDBACK FOR IMPROVEMENT
POINT OF ENTRY	Use case definitions or alert triggers to identify suspected passengers or events related to travel and transport Support community in case finding	Report immediately to the IHR NFP and at the same time, LGA/ national level Report monthly summaries to the national surveillance department/unit, and at the same time, share with the respective LGA and	Prepare and periodically update database of cases/ events detected	Participate in assessing potentially exposed/ infected travellers in a holding/treatment centre Support investigation of suspected passengers and contacts Follow up on rumours or unusual events reported by community leaders or members	Participate in emergency preparedness and response committees within PoE Participate in preparation of PoE contingency plan Participate in training and simulation exercises Participate in cross-border meeting	Assist in referring the ill passenger to the appropriate medical facility Liaise with the emergency and preparedness committee in response activities Assist in case and contact finding Follow and model best practices in basic infection prevention and control measures	Build relationships, communicate and coordinate for information sharing with various stakeholders (IHR FP, civil aviation/port authorities, ICAO Build communication with ship and ship industry operators, regarding authorization and the Maritime Health Declaration, Build relationship with surveillance officers across all levels and the IHR national focal point	Monitor and evaluate prevention activities and modify them as needed Conduct periodic simulation exercises

Annex B: Tool for Assessing Surveillance and Response at the LGA Level

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 has with health services. For example, list the following sources on a list of LGA reporting sites:
   (a) Health facilities and hospitals
   (b) Laboratories (including non-public ones: private for profit, military, NGOs, faith-based)
   (c) Point of entry
   (d) Community health workers (including community animal health workers)
   (e) Community volunteers or focal points (shopkeepers, market women, barbers, farmers, etc.)
   (f) Birth attendants
   (g) Traditional healers
   (h) Rural community leaders who have knowledge of health events in the community (for example, the village elders, school teachers and leaders of faithbased organization)
   (i) Public health officers
   (j) Private sector practitioners
   (k) Public safety officers from the fire, rescue or police departments
   (l) Animal health and veterinary services
   (m) Industry, food safety and environmental health laboratories
   (n) Mass media, web sites and health news search applications
   (o) Others, including NGOs.

It is important to also have and maintain a logbook to report alerts and feedback loop to confirm or debunk signals

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

Annex B: Tool for Assessing Surveillance and Response at the LGA Level

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 or events, such as unexplained cluster of illness or deaths, which require immediate reporting;
   (b) targeted for elimination and eradication;
   (c) of public health importance, including non-communicable diseases.
5. For each priority event, disease or condition, review the minimum data elements that health facilities and other sources should report. State when they should be reported, to whom and how. State the information that should be reported from inpatient 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, form or voice). If there is electronic reporting, do all facilities have access to computers and modems? Specify how electronic reporting should be done and if paper forms will be used to collect data, how transcription will occur from paper to electronic form.
   (c) Define how often the required data should be reported.
   (d) Define a feedback mechanism from LGA to higher levels (State and National levels).
6. Define the data management tools available in the LGA and how they should be used in an integrated system. Define how frequently the tools should be used for reporting diseases, conditions or events. The tools may include:
   (a) Case-based surveillance reporting forms (IDSR001A);
   (b) Diagnostic (if point of care is used) and lab-specimen-based surveillance reporting forms (IDSR001B);
   (c) Line lists (IDSR001C) for use in outbreaks while also ensuring comprehensive capture of variable from other non-human sectors;
   (d) Specimen tracking forms/logbooks (within the laboratory) and also forms/logbook for referral of specimens;
   (e) Contact tracing forms;
   (f) Tables for recording summary totals:

Annex B: Tool for Assessing Surveillance and Response at the LGA Level

(i) Routine weekly reporting forms
(ii) Routine monthly reporting forms
(iii) Graphs for time analysis of data
(iv) Maps for place analysis of data
(v) Charts for data analysis by person

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, State and national levels. If electronic reporting is not available, ensure that the focal points responsible for managing data have a reliable supply of data collection forms, paper, graph paper, and log books.
8. Define mechanism to ensure that data is collected as per given timelines and introduce mechanism for accountability if reports are not submitted on time.

Data Analysis

9. Define the data management requirement for each reporting site. For example, develop and disseminate the procedures, including deadlines, so that reporting sites know that they must report each reporting period (for example, monthly). The activities of data management includes to:
   (a) Tally, compile and report summary totals
   (b) Periodically check data quality and eventually clean them
   (c) Analyse 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, WhatsApp, e-mail, fax/case-based forms, and line list)
   (f) File and secure back-up copies of the data
   (g) Provide feedback and recommendations to the community focal points, all relevant reporting sites and community leaders, and track implementation of recommendations.
10. 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 priority diseases targeted for surveillance?
11. Gather and present relevant data about your LGA that can be used to advocate for additional resources for improving surveillance and response activities.

Annex B: Tool for Assessing Surveillance and Response at the LGA Level

Investigation and Confirmation of Suspected Cases, Outbreaks or Events:

12. Describe the laboratory and diagnostic referral network for confirming priority diseases and conditions in the LGA. For example, list the following:
    (a) Public, private or NGO LGA facilities which have point-of-care diagnostics or use Rapid Diagnostic Tests laboratory services.
    (b) Public, private or NGO LGA facilities with reliable laboratory services for confirming priority diseases.
    (c) Prevention, control or special surveillance activities in the LGA with laboratory access (for example, any HIV sentinel surveillance sites in the LGA).
13. Describe the methods or mechanism for active case search, and where appropriate, the procedures for searching for contacts.

Preparation for response to outbreaks and other public health events

14. Update the policies of the LGA rapid response team so that assessing preparedness becomes a routine agenda item for the team. Refer to Section 4 for composition of the public health emergency RRT.
15. Identify a coordination mechanism which will oversee the meetings for preparedness and response. Refer to Section 5 on how to formulate a coordination mechanism and the composition of the team, which will lead the response and planning process for meetings. Specify and disseminate schedules for:
    (a) Meetings to routinely assess preparedness for public response and discuss current problems or activities. Put mechanisms such as reminders in place to ensure that meetings take place as planned;
    (b) Meetings to discuss outbreak response, including reviewing key recommendations and actions, and status of implementation.
16. For each priority event, disease or condition selected, state the available public response activity and develop a contingency plan for the particular priority event, disease or condition. Identify possible activities and interventions for which the LGA would require help from outside. Refer to Sections 4, 5, 6 and 9 for key standard elements needed in the preparedness and response activities.
17. For each disease or condition that the LGA can respond to, specify the target and alert threshold, or analyze results that would trigger an action.

Annex B: Tool for Assessing Surveillance and Response at the LGA Level

Communication and feedback

18. Define methods for informing and supporting health workers in the implementation of integrated disease surveillance by:
    (a) Listing the current opportunities for training health workers in surveillance, response or data management in the LGA.
    (b) Coordinating training opportunities between disease programmes that take advantage of overlapping skills such as supervision, report writing, budgeting, data analysis, and using data to set priorities.
    (c) Defining the training needs for each category of health workers, based on supervision, or during response to a particular event. Decide whether this will be an initial training in surveillance and response skills or a Refresher training on how to integrate surveillance activities.
    (d) establishing indicators of quality (management) performance of health workers and regularly assess the performance of health workers.
19. Describe how communication about surveillance and response takes place between the LGA and the surveillance focal points and other focal points from animal and other key relevant sectors. Clarify who is responsible for periodic reporting at each level. Include methods such as monthly meetings, newsletters and telephone calls.
20. 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 summarising data reported by health facilities to the LGA.
    (b) Periodic meetings to discuss public health problems and recent activities.
    (c) Supervisory visits.
21. Outline the communication mechanism available, including protocols and guidelines for risk communication. Identify a spokesperson and ensure training has been done on required protocols. Develop a mechanism of linkage between the community and health facilities with the epidemic preparedness and response committee that can be activated during an outbreak and for routine activities. Refer to Sections 6 and 7 of the guidelines, on the key elements for risk communication before, during and after the outbreak.

Evaluation and improvement of the surveillance system

22. Decide if additional indicators will be required to evaluate the system and plan on how to monitor and evaluate timeliness and completeness of reporting.
23. State three or more objectives you would like to achieve for improving surveillance in your LGA over the next year, based on evidence.

Annex C: Required Surveillance and Response Core Capacities as Described in the 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 party is expected to assess the ability of existing national structures and resources to meet the minimum requirements. Based on the results of the assessment, each Member State should develop and implement an action plan to ensure that these core capacities are present and functioning throughout the country

Annex 1 Part A of the IHR (2005) defines the core capacity requirements for surveillance and response. The regulations recognise the following three levels of the health care system:

(a) LGA/Community or primary public health response level
(b) Intermediate public health response level
(c) National level

Local Community or Primary Public Health Level Response

At the local community level and/or primary public health response level, the capacities are to:

(a) Detect events involving disease or death above expected levels for the particular time and place in all areas within the country
(b) report all available essential information immediately to the appropriate level of healthcare response (within 24 hours). At the community level, CBS focal persons shall report to the appropriate health facility in their respective catchment areas. At the primary public health response level, reporting shall be to the intermediate or national response level, depending on organisational structures.

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

(a) Clinical descriptions of cases
(b) Laboratory results
(c) Sources and types of risk
(d) Numbers of human cases and deaths
(e) Conditions affecting the spread of the disease, which may include environmental issues such as water and sanitation, personal travel history and that of neighbours, behaviour issues, such as burial practices, distance to health facility/care, efforts to seek care before detection; weather and accessibility, floods, insecurity, and migrant/internally displaced persons/ refugee population. Public health measures employed, including any bylaws instituted; and implementation of hygiene measures.

Annex C: Required Surveillance and Response Core Capacities as Described in the IHR

Intermediate (State/LGA) Public Health Response Levels

The core capacity requirements at the LGA level are:

(a) Confirming the status of reported events and supporting or implementing additional control measures

(b) Assessing reported events immediately and, if urgent, reporting all essential information to the national level within 24-48 hours. For the purposes of this Annex, the criteria for urgent events include serious public health impact and/or unusual or unexpected nature with high potential for spread.

National Level: Assessment and Notification

The response at national level consists of two functions - assessment and notification:

Coordinate with World Organisation for Animal Health focal person and the International Food Safety Authorities Network focal person and other sectors to ensure coordination in assessment and notification of events. Assess all reports of urgent events within 48 hours.

Notify WHO immediately through the National IHR focal point when the assessment indicates that the event is notifiable under paragraph 1 of Article 6 of the IHR, and the decision instrument assessing and notifying events that may constitute a PHEIC in Annex 2 of the IHR, and inform WHO as required, pursuant to Article 7 and paragraph 2 of Article 9 of these Regulations.

At the national level, the public health response requires the capacity to:

a. Coordinate by establishing a coordination mechanism which may include setting up a public health emergency operation centre or a similar coordination structure, and activating the Incident Management System (See Sections 5 and 6 for more details).
b. Determine rapidly the control measures required to prevent domestic and international spread
c. Provide support through specialized staff, laboratory analysis of samples (domestically or through collaborating centres) and logistical assistance (equipment, supplies and transport).
d. Provide on-site assistance, as required, to supplement local investigations.
e. Provide a direct operational link with senior health and other officials for rapid approval.
f. Implement containment and control measures.

Annex C: Required Surveillance and Response Core Capacities as Described in the IHR

g. Provide direct liaison with other relevant government ministries.
h. Provide, by the most efficient means of communication available, links with hospitals, clinics, airports, ports, ground crossings, laboratories and other key operational areas for the dissemination of information and recommendations received from WHO regarding events in Nigeria and her neighbouring countries
i. Establish, operate and maintain a national public health emergency response plan, including the creation of a One Health team to respond to events that may constitute a public health emergency of international concern
J. Provide the foregoing on a 24-hour basis.

During several consultations at the global level, the core capacities were summarised into eight components: legislation, policy and coordination, surveillance, preparedness, response, risk communications, laboratory and human resources. These eight components are all important for IDSR as well.

Annex D: Roles and Responsibilities of Various Actors in IDSR

Roles and Responsibilities of a Community-based Surveillance Focal Person (Community Health Worker)

Using simplified case definitions to identify priority diseases, events, conditions or other hazards in the community (see Annex 1B), the focal person:

(a) Conducts household visits on a regular basis
(b) Meets with key informants on a regular basis
(c) attends local ceremonies and events and follows up on any unusual occurrence, such as someone expected to show up but did not
(d) Records priority diseases, conditions, or unusual health events in the reporting forms and tools (tally sheets) and reports to the supervisor at the HF immediately (within 24 hours)
(e) Participates in verbal autopsies by administering interview questions prepared by the supervisor at the health facility
(f) Sends rapid notification, to the nearest health facility and other relevant sectors, of the occurrence of unexpected or unusual cases of disease or death in humans and animals for immediate verification and investigation according to the International Health Regulations and in line with the IDSR strategy (within 24 hours)
(g) Involves local leaders in describing disease events and trends in the community
(h) Raises the community's awareness about reporting and seeking care for priority diseases, conditions and unusual events
(i) Supports health workers during case or outbreak investigation and contact tracing
(j) Mobilises local authorities and community members to support response activities
(k) Participates in risk mapping of potential hazards and in training, including simulation exercises
(l) Participates in containment and response activities in coordination with the LGA level
(m) Participates in response activities, which could include, home-based care, social or behavioural change of traditional practices, logistics for distribution of drugs, vaccines or other supplies; providing trusted health education in a crisis is a useful contribution
(n) Gives feedback to community members about reported cases, events and prevention activities

Annex D: Roles and Responsibilities of Various Actors in IDSR

(o) Verifies if public health interventions took place as planned, with the involvement of the community
(p) Participates in meetings organized by ward, LGA and higher-level authorities

Roles and Responsibilities of Health Facility Staff at Point of Entry

The health facility staff:

(a) Identify cases of priority diseases using the standard case definitions
(b) Record case-based information and immediately report notifiable diseases, conditions and events to the next level
(c) Liaise with the LGA on how to conduct immediate laboratory investigation of suspected cases
(d) Deal with case management /referral
(e) Prepare for and participate in outbreak investigation, response and case management
(f) Report case based and summary (weekly report) data on time to the next level
(g) Conduct simple data analysis (graphs, table, charts) at point of collection
(h) Communicate diagnosis for outbreak-prone diseases to LGA/community
(i) Identify resources (human, financial, commodities, communication material) and timeline for deployment.
(j) Communicate with LGA DSNO immediately.

Roles and responsibilities of surveillance officer at LGA level (LGA DSNO)

The role of the LGA surveillance officer is to:

(a) Investigate and verify possible outbreaks, collect diagnostic samples, advise on treatment/prevention protocols
(b) Prepare and analyse weekly surveillance reports and submits promptly to higher authorities
(c) Ensure that surveillance sites maintain surveillance reports, logbooks properly
(d) Maintain a list of all reporting facilities/sites
(e) Establish and maintain database of all trained and registered health care workers, who can serve as surveillance focal persons at the reporting facilities as well as other CBS FPs
(f) Ensure adequate supply of data collection and reporting tools at the surveillance reporting facilities
(g) Ensure that the IDSR standard case definitions for all the priority diseases are understood and used by healthcare workers at the facility; provide on-the-spot training if needed
(h) Monitor the performance indicators (such as timeliness and completeness) of the IDSR, as stipulated in the IDSR guideline

Annex D: Roles and Responsibilities of Various Actors in IDSR

i. Maintain an updated line list of suspected cases
j. Assist health care facility in safe collection, packaging, storage and transport of laboratory specimens for confirmatory testing
k. Receive laboratory results from LGA/State and give to HCF
l. Conduct/coordinate on-the-job trainings for surveillance sites with new staff
m. Review the quality of surveillance data from time to time by conducting data quality audits and come up with appropriate measures to improve data quality in the LGA
n. Maintain a rumour logbook to record events for the surveillance site
o. Ensure cross-border (LGA-LGA) coordination and collaboration on surveillance issues and provide notification of any outbreaks in the neighbouring LGA. International or crossborder notification should also be done if needed
p. Document the value added by IDSR and advocate to health management team to support IDSR activities
q. Participate in outbreak investigations and ensure that there is an updated register/line list.

Responsibilities of the LGA Health Management Team

The role of the LGA Health Management Team is to:

a. Liaise, through the Medical Officer of Health/ Primary Health Care Coordinator, with the LGA Chairman/ Supervisory Councilor for Health on overall surveillance activities and plans
b. Support the LGA DSNO to implement planned activities
c. Ensure that surveillance activities are included in the LGA Health Planning of overall activities
d. Liaise with the LGA officials to mobilize funds (at LGA level) for surveillance activities
e. Ensure timely release of funds for surveillance activities
f. Monitor IDSR performance and outputs of data analysis and monitoring tool
g. Participate in risk mapping of the LGA and also in development of plan of action, based on the findings
h. During outbreaks, assist the Public Health Emergency Management committee in organizing the rapid response teams and ensure functionality (see Section 5 for details)
i. Report finding of initial investigation to state
j. Participate in community risk mapping and assessment
k. Participate in establishment and ensure functionality of the emergency preparedness and response committees

Annex D: Roles and Responsibilities of Various Actors in IDSR

l. Design, train, and set up implementation of community health education programmes
m. Participate in and support response training for health care facility and community
n. Together with the state, select and implement appropriate public health response
o. Plan timely community information and education activities
p. Document response activities
q. In case of outbreaks, send daily LGA situation report.

Roles and Responsibilities for Political Leaders and Traditional Leaders at LGA Level

Political leaders and traditional leaders such as village, ward or LGA officers are very important people, who assist in fostering behavioural change on disease surveillance They can play the following roles:

a. Support any declarations of a public health emergency
b. Develop an inventory and identify local human/financial/logistics support. A quick response will often prevent spread
c. Ensure that principles of hygiene and sanitation are followed (environmental cleanliness, availability of latrines and their utilization, advocacy for drinking of clean and safe water, personal hygiene and sanitation measures, including hand washing)
d. Report clusters of illness/death to a nearby health facility
e. Implement the bylaws to enhance principles of hygiene and sanitation
f. Take an active role in sensitising community members on how to promote, maintain and sustain good health
g. Facilitate community-based planning, implementation and evaluation of health programmes within the ward (IDSR is among the programmes)
h. Follow up on outbreaks, in collaboration with health care providers and other extension workers at ward level
i. Provide administrative back up to health care providers at ward and village level
j. Support enforcement of relevant legislations so as to prevent/control outbreak of infectious diseases
k. Supervise subordinates in ensuring that principles of hygiene and sanitation are followed
l. Ensure regular convening of public health care committee meetings (or set up one) when an outbreak occurs

Annex D: Roles and Responsibilities of Various Actors in IDSR

m. Discuss disease patterns and their implications for action, as part of regular meetings with LGA Medical Officer
n. Ensure that various committees are established and resourced to perform activities
o. Solicit resources from various sources to respond to disasters, including epidemics
p. Conduct advocacy on health matters in different campaigns carried out in the LGA.

Roles and Responsibilities of the State Public Health Management Team

Through the State Director, Public Health (at the MoH) or its equivalent, liaise with State commissioner as well as the Director General NCDC, on overall surveillance activities and plans for the State and LGAs

a. Support the State Epidemiologist, State DSNO and LGA DSNO to implement planned activities in their respective LGAs
b. Ensure that surveillance activities are included in the state health planning of overall activities, as well as in respective LGAs in their plans
c. Liaise with relevant state officers to mobilise funds for surveillance activities and ensure timely release of funds for surveillance and response activities for the entire state
d. Monitor LGA IDSR performance and outputs of data analysis and monitoring tool
e. Participate in risk mapping of the LGAs and assist LGAs in developing plan of action, based on the findings
f. During outbreaks, assist the Public Health Emergency Management Committee in organising the public health emergency state rapid response teams and ensure functionality for both state and LGAs levels (see Section 5 for details)
g. Report findings of initial investigation to national level
h. Participate in establishment and ensure functionality of the state and respective LGAs emergency preparedness and response committees
i. Assist LGAs in risk mapping and community assessment
j. Assist LGAs in design and implementation of community health education programmes
k. Participate in and support response training for LGAs
l. Assist LGAs in implementing appropriate public health response and also facilitate cross-border LGA surveillance and response initiatives

Annex D: Roles and Responsibilities of Various Actors in IDSR

Role of Nigeria Centre for Disease Control

a. Set up a public health emergency operation centre or similar coordination mechanism for coordination of preparedness and response activities of a public health event, including an incident management system, plans and procedures. Guide states to set-up similar structures at state level. Refer to Section 5 for details
b. Identify spokesperson and outline risk communication plan, including engagement of media, for sharing information before, during and after a public health emergency; as outlined in the section ---- on Risk Communication)
c. Set standards, policies and guidelines for IDSR and update the Emergency Preparedness and Response (EPR) plans based on simulations and After Action Reviews
d. Assess available capacity at national level and rectify accordingly, while ensuring inclusion of surge capacity in the Public Emergency Health Preparedness and Response (PHEPR) plan
e. Identify domestic resources and mobilise and coordinate external support for implementation of IDSR
f. Conduct overall supervision, monitoring and evaluation of IDSR activities
g. Produce and disseminate epidemiological bulletins
h. Monitor implementation of inter country, regional and international agreements/protocols
i. Support investigation of suspected epidemics detected through surveillance
j. Provide national level data management and analytic support.

Role of WHO and Other Partners

a. Contribute to setting standards and developing guidelines
b. Provide technical assistance, expertise, and other material support to strengthen Nigeria's disease surveillance, and laboratory and health information systems
c. Support Ministry of Health in mobilizing resources for surveillance and response activities
d. Support supervision, monitoring and evaluation of IDSR
e. Provide management support (for instance writing funding proposals, Support capacity-building, training, equipment etc.
f. During public health emergencies, support by sending technical experts, surge staff (if needed during response) and provide portable laboratories and other equipment and vaccines

Annex E: Alert Reporting Form

S/No	Rumour Log **[Send this form immediately to your supervisor or nearby health facility]**		
1	Name of Community Informants/Agents focal person reporting:_____ _____		
2	Telephone number: _____	Community: _____	LGA_____
3	Reporting date(day, month, year): _____/_____/_____		
4	Type of illness/Condition/Event/Alert (please describe): _____ _____		
5	Source of information: Observed/Print & Media/Social Media(Facebook/Twitter/Whatsapp), others Specify		
6	When did this happen (Date: Day/Month/Year); Time		
7	Date/time this was detected (Format: Day/ Month/Year):	Time:	
8	Where did this happen? (Location: community, ward/LGA, LGA)		
9	How many people have been affected?		
10	Has anyone died? If yes, how many		
11	Are there sick or dead animals involved?		
12	Is the event ongoing as at the time of this report?		
13	If yes, is it increasing or decreasing or static		
14	What action has been taken?		
15	Has this been verified by health facility / LGA DSNO		

Annex F: Guide for Establishing Surveillance and Response Systems at POE

A. Purpose

The purpose of the International Health Regulations (IHR 2005) is to prevent, protect against, control and provide public health response to the international spread of diseases in ways that are relevant and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade. It calls for strengthening national capacity for surveillance and control, including sites such as points of entry, namely seaports, airports and ground crossings; prevention, alert and response to international public health emergencies; global partnerships and international collaboration. In addition to the IHR, it is essential for border health activities to be sustainable and align with other surveillance activities under IDSR.

A system to detect, report, and respond to ill travellers is appropriate. The long-term strategy is to work towards full compliance with IHR at official PoEs, while ensuring that the PoEs also have contingency plans. All designated PoEs must have routine capacities for surveillance and response.

B. Key Stakeholders

Ministry of Health, local government authorities, airline and maritime authorities, (Federal Airports Authority of Nigeria, Nigerian Ports Authority, Nigerian Civil Aviation Authority, Nigeria Airspace Management Agency, Nigerian Maritime Administration and Safety Agency, et.c) Nigeria Immigration Service, Nigeria Customs Service, Ministries of Transport, Environment, Nigeria Quarantine Service, Security agencies, Conveyance operators (Bus operators, airlines, shipping lines etc.), WHO, International Organization for Migration, and other key partners.

C. Key Areas for Surveillance and Eesponse at Points of Entry

1. Routine measures should be in place at points of entry for the detection of ill travellers; reporting to health authorities; rapid public health assessment; and access to healthcare for severely ill travellers or those whose symptoms suggest a risk to public health, including safe transportation from the point of entry to a healthcare facility.

Designated POEs are POEs with capacity to respond to public events of international concern as recommended in the IHR annex 1b. The following are the designated POEs in Nigeria (2019): Murtala Mohammed Airport, Nnamdi Azikiwe International Airport, Mallam Aminu Kano International Airport, Apapa Seaport

2. Detection of ill travellers should include, at least, the following:
   i. Reporting of ill travellers or deaths on board international aircraft, ships or ground crossing points, who arrive at PoE stipulated by various guidelines.

Annex F: Guide for establishing surveillance and response systems at PoE

ii. Port health officers and/or immigration officers who are present at designated points of entry should be trained to recognize ill travellers they encounter during their routine assessments as well as to conduct an initial assessment of whether or not the illness poses a potential public health risk.

3. Arrangements for the initial response to an ill traveller, if detected at a point of entry, should include, at least, the following:
   i. The ability to rapidly isolate the ill traveller from others, to avoid potential spread of disease
   ii. Standby health teams should be available, either in person or remotely by telephone, to conduct a rapid assessment of ill travellers detected at points of entry to determine if a communicable disease of public health concern is suspected
   iii. A healthcare facility located close to the point of entry should be designated to provide medical care as needed to severely ill travellers or those with a suspected communicable disease of public health concern.
   iv. The designated facility should have adequate infection, prevention and control capacity to prevent spread of disease to staff or other patients, and diagnostic capacity, including access to laboratory diagnostics
   v. Ambulance service or other safe transportation should be available to facilitate transport of ill travellers from the point of entry to the designated healthcare facility
4. As needed, during a declared public health emergency affecting international travellers or with the potential for international spread of disease, there should also be capacity to implement at short notice, traveller screening or other border health measures, as recommended by WHO.

During an Emergency or Outbreak Response, Cross-border Coordination Should Include:

a. Stakeholders' meeting as soon as the epidemic or event is recognised
b. Assessing the need for, and request support from, the state or national emergency preparedness and response committee or rapid response teams when necessary
c. Meeting regularly to assess the status of the outbreak or epidemic as indicated
d. Regularly sharing surveillance data, addressing case counts (including zero cases if applicable) and status of contact tracing (if indicated)
e. Sharing information on travel history of cases and identified contacts to facilitate coordinated response on both sides of the border
f. Regularly reviewing the epidemic response and taking action to improve epidemic control actions as indicated
g. Documenting and communicating epidemic response actions escalating notifications as needed
h. Coordinating vector surveillance and control activities if a vector is indicated for the outbreak

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1.0 Detect and Record Cases of Priority Diseases

The IDSR strategy incorporates both Indicator-Based Surveillance (IBS) and Event-Based Surveillance (EBS) approaches to early detection of priority diseases, conditions and events. This chapter describes how to detect priority diseases, conditions and events using standard case definitions. The chapter also gives guidance on establishing EBS and using this approach for alert detection, triaging and verification of public health events. In addition, the chapter gives a description of procedures which need to be followed when planning for surveillance and response activities in your catchment area and emphasizes the role of the laboratory in surveillance and response.

1.1 Detection of Priority Diseases, Conditions and Events

Health staff (human, animal, and environmental) should conduct surveillance activities at all levels of the health system (public and private) so they can detect public health problems of concern in their communities.

Community members play an important role in surveillance by facilitating early detection and response to priority diseases, conditions and events. Community members should be oriented in surveillance so that they can actively participate in detecting, reporting, responding to and monitoring health events related to humans or animals in their catchment area.

Various public health events and or risks may occur at Points of Entry (PoE). These health events can be recognised before, during or after travel, but often when travellers have already left the PoE. Staff at PoE must be vigilant in ensuring that these events are identified and reported appropriately on time to facilitate response.

Surveillance priorities may be communicable and non-communicable diseases, conditions or events that include international, national, state or local priorities associated with human and/or animal health which might have direct consequences to 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) A person falls ill and seeks treatment from a health facility

(b) High rate of hospital admission for the same disease(s) or symptom(s)

(c) Community members report unusual events or occurrences at local levels such as a cluster of deaths or unusual disease pattern to the health facility

(d) A school reports unusual absence due to similar signs and symptoms such as an influenza-like illness (ILI) to the LGA DSNO

(e) Health staff who conduct routine record reviews to find cases for a specific disease observe that cases of another priority disease have not been reported. For example, an officer who normally reviews the clinic register for cases of Acute Flaccid Paralysis (AFP) also sees that a case of cholera has recently been recorded in the clinic register.

(f) Health staff conduct routine record reviews of the laboratory register and observe recorded confirmed cases of priority diseases such as yellow fever or cholera

(g) Radio, television, newspapers, or social media (WhatsApp, Facebook, Twitter etc.) reports a rumour of rare or unexplained events in the area with potential exposure to humans

(h) Vital events records show an increase in maternal deaths

(i) Unusual reports of illness among health-care workers

(j) During analysis of the routine reports from all the health facilities in the area, the LGA DSNO notices that other health facilities in the catchment area have also reported adult deaths due to bloody diarrhoea which might signify an outbreak of dysentery caused by Bacillary dysenteria or Escherichia coli

(k) An unusual death or number of deaths among animals, such as livestock, birds or rodent species, or an unusually high number of sick animals presenting the same signs

(l) During assessment of water bodies, environmental officers observed contamination likely due to lead or other related chemicals resulting from mining activities, which might be an early trigger for public health interventions.

1.2 Indicator-Based Surveillance (IBS) and Event-Based Surveillance (EBS) Approaches Used to Detect Diseases, Conditions and Events

The IDSR strategy uses both Indicator-Based Surveillance (IBS) and Event-Based Surveillance (EBS) approaches to detect diseases, conditions, and events. As part of efforts to increase the sensitivity of the surveillance system, in Nigeria the EBS system alongside the IBS should be established at all levels of the health system; national, state, LGA, health facility and the community levels. The IBS involves the use of standard case definitions to identify diseases, conditions, and events, while EBS uses alerts detection, triaging and verification to detect events. In contrast with case definitions that are narrow and disease-specific, EBS requires the detection and immediate reporting of alerts, which are broad and indicate the possibility of a serious public health event. Alerts that are verified and proven to be true are classified as events.

IBS and EBS are an integral component of routine IDSR activities of the surveillance system. Both IBS and EBS should be integrated into existing infrastructure set aside for routine IDSR strategy with requisite resources.

1.3 Standard Case Definitions

A standard case definition is an agreed-upon set of criteria used to decide if a person has a particular suspected disease, condition or event. The definition specifies clinical criteria, laboratory diagnosis and specifications on time, place and person.

Why do We Need Case Definitions?

(a) To help decide if a person has a presumed disease, condition or event, or to exclude other potential disease diagnoses

(b) To ensure that every case is diagnosed in the same way, regardless of where or when it occurred, or who identified it

(c) To initiate action for reporting and investigating quickly if the clinical diagnosis takes longer to confirm

(d) To compare the number of cases of the diseases, conditions or events that occurred in one time or place with the number occurring in another time or place

Using standard case definitions is important in implementing the IHR 2005 in the context of IDSR. At all levels, including community, health workers (human, animal, environment) must be aware of case definitions of diseases, conditions or events that may affect not only the local community but also have the potential for spread across geographical boundaries.

In describing Standard Case Definitions, for health facility level, **a three-tiered classification system is normally used – Suspected, Probable, Confirmed:**

(a) **Suspected Case:** indicative of clinical picture, i.e. patient may have fewer or atypical clinical features without being a confirmed or a probable case

(b) **Probable Case:** clear clinical picture, (meets the clinical case definition) i.e. patient will have typical clinical features of the illness or is linked epidemiologically to a confirmed case, but a laboratory sample cannot be taken because the case is lost or dead or a sample has been taken but was not available for laboratory testing or was not viable for sufficient laboratory testing

(c) **Confirmed Case:** a suspected case verified by laboratory diagnosis

Case definition classification might vary according to the epidemiology of the individual diseases

In all outbreak scenarios, a more sensitive case definition to identify all suspected cases should be used. Identification of cases in these scenarios will use the syndromic surveillance approach where case detection will be based on clinical features without any laboratory diagnosis. If in the middle of an outbreak, the causative agent is established, cases may continue to be classified as either suspected or confirmed. An additional tier classification, that is, "Probable case definition", may be added if officials feel that conducting laboratory tests on every patient with a consistent clinical picture and a history of exposure (for example, measles) isnot required.

Case definitions at the community level are usually simplified and are used to facilitate rapid detection of priority diseases, events and conditions or other hazards in the community. Case definitions at this level use key signs and symptoms to help

the community to recognize when they should refer a person with these signs and symptoms for treatment and notify the health facility. Examples of how key signs and symptoms of community case definitions may be described are contained in Annex 1B.

All cases (suspected, probable and confirmed) should always be recorded in a recognised facility register or logbook, and the IDSR reporting forms.

1.3.1 One Health Approach in Identification of Events

One Health aims at applying a holistic approach in jointly detecting events and conducting risk assessments in responding to possible public health events occurring at the human-animal-environment interface. Detection of events under the One Health approach requires all levels from community, health facility (human and animal), LGA, state and national, to strengthen collaboration across sectors, and jointly share responsibilities of detecting events which might have an impact on the health of humans, and their shared environment.

Examples of the One Health approach include:

i. Detection of a rabid animal or reports of animal illness from the veterinary sector, which can facilitate investigations of human cases of rabies

ii. Reports of human diseases which can be traced through exposure to chemical hazards within the environment

1.3.2 Distribute Standard Case Definitions and Registers to Health Facilities

Make sure that health facility personnel at all levels including PoE(s) know and have available standard case definitions (including those for reporting unusual events, disease patterns, or unexplained deaths) specified by the national level.

The NCDC and all State Ministries of Health should print and disseminate case definitions for diseases under surveillance in the form of a poster,

small pocket-sized booklet etc. These tools reinforce the use of standard case definitions for detecting and reporting priority diseases, conditions and events.

Ensure that health facility and reporting sites personnel know the process for recording and reporting using the Outpatient Department (OPD) or Inpatient Department (IPD) registers. Also ensure that health facilities record rumours using rumour log.

Surveillance officers should always liaise with the health information focal person to extract the priority disease of IDSR from the registers.

Surveillance at Tertiary Health Facilities/Institutions

All tertiary health facilities should be actively involved in disease surveillance. A tertiary health facility should have designated surveillance focal person(s) who works with the LGA DSNO to regularly update surveillance data from the facility.

Surveillance at the **private health facilities**

Private health facilities (Hospitals, laboratories, pharmacies etc.) should be actively involved in surveillance. All private health facilities should designate a surveillance focal person who will liaise with the LGA DSNO on surveillance activities.

Proposed case definitions based on established disease-specific programmes are in Annex 1A and are available in Chapter 11 of these guidelines.

1.3.3 Distribute Community Level Case Definitions Using Key Signs and Symptoms

State Epidemiologists and LGA DSNOs should provide information to community health workers, traditional healers, birth attendants, community leaders and community volunteers on how to recognise and report priority diseases, conditions or events to the health facility. A list of examples of case definitions for use at the community level is in Annex 1B of this chapter.

At the same time, emphasise the need to refer people with the suspected disease or condition for treatment. Provide them with procedures for reporting, including when and where to report; and ensure provision of necessary tools. Design simple community alert forms for reporting events, and tools to enable them refer a suspected case (see Annex 2B).

Community health workers and volunteers should be trained on how to complete the forms and develop mechanisms of capturing information for those who are non-literate

For example, identifying a family member who can assist with actual writing. Provide information to the community on priority diseases, using posters, newsletters and announcements during meetings. Also provide feedback methods and how timely information will be made available to the community. This will encourage community members to participate in surveillance and response activities and also understand the people in their community and any changes in their health.

1.4 Establish Event-Based Surveillance (EBS) at all levels

The NCDC and State Ministries of Health should ensure that the event-based surveillance (EBS) system is established at all levels of the health system alongside the Indicator-Based Surveillance (IBS) system.

The establishment of EBS involves taking into consideration its functions as illustrated in figure 1.1

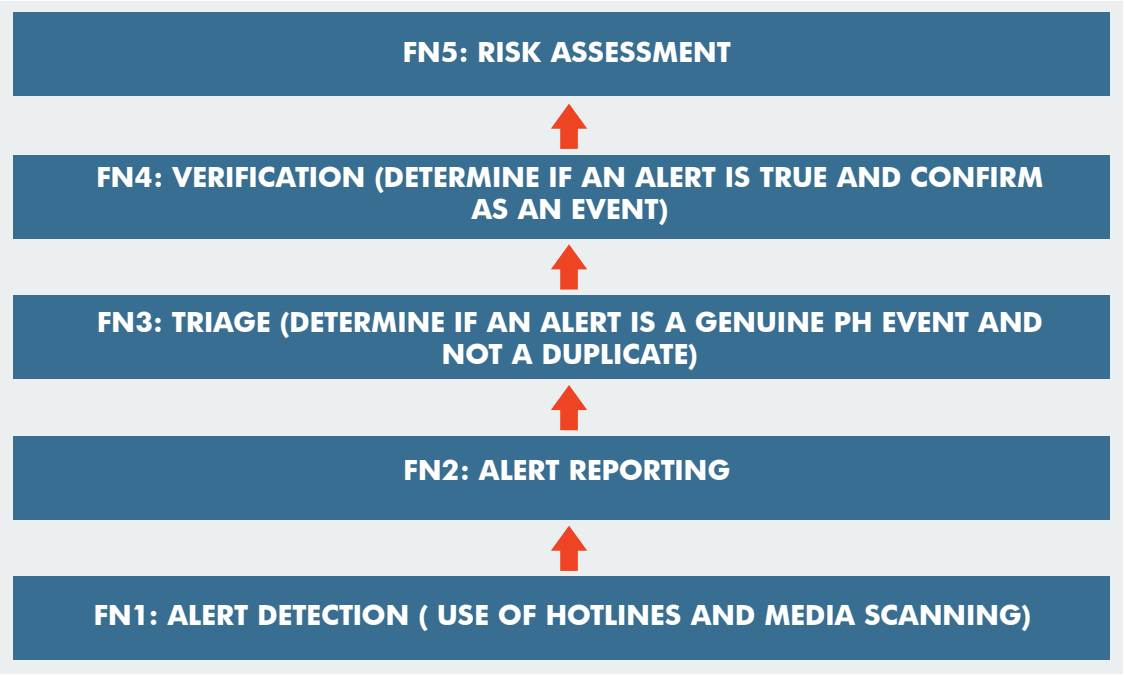


Figure 1.1: Functions of EBS at all levels of the health system

Steps for monitoring and verifying alerts in EBS:

Step 1: Establish EBS Hotlines and Media Scanning for Alert Detection
Step 2: Alerts Detection
Step 3: Registration of EBS Alerts
Step 4: Conduct triaging of EBS Alerts
Step 5: Conduct Verification of EBS alerts
Step 6: Conduct risk assessment and characterization

The steps for establishing EBS at the national, state, LGA and health facility levels are described in Annex 1C of this chapter.

1.5 Update LGA procedures for surveillance and response

Every year, NCDC should convene a meeting for national, state and LGA health officials to update and adjust procedures for surveillance and response accordingly.

1.5.1 Update the Description of the Catchment Area

At least annually, State Epidemiologists and LGA DSNOs should update information about the catchment area (health facilities, schools, internally displaced persons (IDPs) camps, PoE, laboratories etc.). This activity should be part of the health planning at the LGA, state, and national levels. Make sure there is a description on local population characteristics in the catchment area, what activities are happening, what risks should be accounted for, and what surveillance assets and gaps exist.

Risk mapping should extend to all public health hazards as specified by IHR (2005), including biological, chemical, zoonotic, radiological and nuclear hazards. It is important to include results from the risk mapping. WHO has developed an integrated risk profiling tool for assessment of public health threats, and this can be used within the broader framework of disaster risk management. (Strategic Tool for Assessing Risk Star, WHO, Draft Version, 3.3.1, July 2017).

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 (e.g chemical industries, oil refineries) or slums where there is a public health risk, especially during heavy rains or poor latrine coverage.

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

(a) The size of key target populations at all levels such as children less than five years of age, school-aged children, women of childbearing age, all children and adults from ages 1 to 30, people living in refugee settlements, internally displaced persons' settlements, out-of-school, youth and other vulnerable groups like working-age groups, people with disability and the elderly.

(b) Major public health activities in the area including public, private, and non-governmental organization (NGO) immunisation activities, clean water projects, family planning clinics, feeding centres for malnourished children, refugee camp health activities, information related to risk factors for non-communicable diseases and so on.

In updating the LGA profile, several methods should be used among which is the creation of a forum with key health stakeholders (involved in One Health approach) at all levels within the LGA, where there will be discussion on surveillance and response activities related to priority health events. This can facilitate getting updates from stakeholders on various key areas in surveillance and response in which they are involved and could be done through a monthly or quarterly meeting where feedback should be made to the institutions providing them.

1.5.2 Update the List of Reporting Sites and the Names of Focal Surveillance Officers in the LGA

IThe LGA DSNO should:

1. Identify all the health facilities, PoE, and any other location in the LGA including community focal points required to report surveillance data or events to the next level.
2. Create relationships with private facilities and CSOs, including the faith-based sites in the LGA, and involve them in surveillance activities. 3. Ensure laboratory facilities, if separate, are also recorded as reporting sites.
4. Record (update as needed) health facility and PoE locations and names of staff who are responsible for surveillance activities.
5. Update the records for community focal points which may include community health workers, traditional birth attendants, community leaders, community informants etc.
6. Ensure that contact information such as telephone, email, etc. is recorded.
7. Identify untrained focal persons and plan for their training or orientation.

1.5.3 Identify Potential Community Representatives That Can be Engaged in Community-based Surveillance

A community informant should be selected by the communities they live in so as to increase empowerment and ownership of CBS. Any person acceptable by the community can be an informant. Representation could be from basic community-level services such as traditional birth attendants, community health influencers and promoters, similar care providers, village leaders (religious, traditional or political), school teachers, agricultural extension workers, health extension workers, patent medicine vendors, barbers, local guards and traditional healers.

The LGA DSNO should have an updated inventory of the selected people with their contact information, including the corresponding health facility. Ensure they have a list of simplified community case definitions to facilitate case detection and reporting.

A sample worksheet for listing the reporting sites and contact focal person at each site is in Annex 1C of this section.

1.5.4 Distribute Updated Data Collection Forms, Reporting Tools, Line List, Registers and Technical Guidelines

As updates of the catchment area description are conducted, the LGA DSNO should ensure that all reporting sites have an adequate supply of surveillance reporting tools (forms, line list, registers or other means for reporting surveillance data to the LGA). This must also be done during regular supervisory visits. 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 should be included. Keep and update inventory of all information to assist in necessary follow-ups.

1.6 Role of the Laboratory in Surveillance and Response

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

Laboratories should be used as early warning alerts to detect pathogens and other hazards that have potential to spread, for example, emergence of resistant strains in the hospital or the community (multi-drug resistant tuberculosis). Laboratory confirmation of diagnoses of diseases, conditions and events under surveillance is essential in order to:

(a) Accurately confirm the diagnosis in an individual patient
(b) Verify the cause (or etiology) of a suspected outbreak or other events.

1.6.1 Specimen Collection, Storage and Transportation

The type of specimen collected, the transport medium and its packaging depends on the suspected disease. Specimens should be collected in adequate quantity into appropriate containers at the healthcare facility level or, if necessary, in the field during an outbreak investigation. All specimens must be triple packaged, labelled correctly and accompanied with the correct laboratory forms in order to arrive at the laboratory in good condition to obtain reliable results. Samples should be transported to the laboratory as soon as possible at appropriate temperature range to minimize delays and compromise between collection and processing in the laboratory.

Health facilities should have trained personnel, equipment as well as adequate reagents and consumables to enable sample collection. State should ensure that a trained personnel (LGA DSNO, Laboratory focal person) should transport samples from health facility, community or field to the state capital from where the national sample transport carrier takes over the transportation of the sample to the testing/reference laboratory using the national testing algorithm.

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

(a) A specimen is collected inappropriately, for example, a blood specimen has haemolysed

(b) Delay in transportation and/or processing may result in bacterial contamination in a collected specimen such as urine

(c) Use of wrong transport or storage media or container may cause reduced viability of the suspected organism

(d) Giving antibiotics before specimen for cultures are collected

(e) Wrong temperature is used for storage and transport of specimen

The disease-specific reference tables in Chapter 11 list recommended laboratory procedures for confirming priority diseases and conditions including:

(a) The diagnostic test for confirming the disease or condition

(b) The specimen to be collected

(c) When to collect the specimen

(d) How to collect the specimen

(e) How to prepare, store and transport the specimen

(f) When to expect the results

(g) Sources for additional information

It is necessary to initiate public health measures even before laboratory confirmation has been received. Note that the patient should be isolated based on signs and symptoms and case management should be initiated immediately even prior to laboratory results such as in the case of Viral Haemorrhagic Fevers.

1.6.2 Establish a Laboratory Network

The local surveillance and the laboratory focal persons 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 list of network of national laboratories for confirming priority diseases and conditions is in Annex 1G of this Chapter. 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.

1.6.3 Update of Laboratories Inventory of Supplies, Reagents and Equipment

State Epidemiologists should work with the laboratories regarding supplies, reagents and equipment to avoid duplication and maintain an updated list of supplies, reagents and equipment available in each laboratory. This should be done especially in public health facilities, but an attempt should be made also from private facilities to obtain a comprehensive inventory. The inventory should also consist of telephone numbers of the laboratory focal persons.

1.6.4 Standardise Laboratory Procedures for Confirming Priority Diseases and Conditions

The national level should make sure that laboratory protocols and guidelines are established and known at all levels. A laboratory focal person should be identified at all levels. Each laboratory focal person should make sure that laboratory protocols, guidelines and procedures are followed at their assigned level. Refer to Annex 1F for roles and responsibilities of laboratory focal persons at all levels.

1.6.5 Establish a Laboratory Quality Control and Assurance Programme

A quality assurance programme (internal and external quality control) is the backbone of good laboratory performance. Laboratory quality control and quality assurance are important for building confidence in the results obtained.

Establishing or strengthening the laboratory quality assurance programmes will allow improvement of the reliability and reproducibility of laboratory results. Coordinate with state or national laboratory authorities to establish activities for ensuring quality results from laboratories in the catchment area.

Standard operating procedures (SOPs) are among the most important documents in a diagnostic laboratory. Ensure that each laboratory has up-to-date written SOPs for all techniques performed in the laboratory. These procedures should be the same throughout a country's laboratory network so that each laboratory is performing tests in the same manner. These SOPs should also incorporate internal quality controls. In addition, laboratories should participate in quality assurance programmes, and corrective actions implemented, in order to maintain excellence in the laboratory. Laboratories should be encouraged to engage in the WHO Stepwise Laboratory Improvement Process Towards Accreditation (SLIPTA) if not yet accredited. Refer to WHO Stepwise Laboratory Quality Improvement Process towards Accreditation (SLIPTA) [Checklist Version 2:2015 for Clinical and Public Health Laboratories for how to do SLIPTA assessment and http://apps.who.int/iris/handle/10665/204423].

1.7 Annexes to Chapter 1

Annex 1A Community level case definitions using key signs and symptoms
Annex 1B Guide for establishing Event-Based Surveillance (EBS) at the national, State, LGA and health facility levels
Annex 1C List of LGA reporting sites
Annex 1D Laboratory functions by health system level
Annex 1E Responsibilities of Laboratory Focal Persons at All Levels
Annex 1F List of national health and veterinary laboratories for confirming priority diseases, conditions, and events

Please refer to http://ncdc.gov.ng/idsr_forms for samples of these forms

Annex 1A: Community Level Case Definitions Using Key Signs and Symptoms

Inform community leaders, community health workers, traditional healers, traditional 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 key signs and symptoms of case definitions which have simple language and easier to understand than the IDSR health facility case definitions. The following are examples of some of selected case definitions which can be used to help the community to recognize the diseases and refer a person with these signs for treatment and notify the health facility.

Examples of how key signs and symptoms of case definitions may be described at the community level	
Acute Flaccid Paralysis (AFP)	Any child under 15 years of age with a sudden onset of weakness and /or inability to use his/her hand(s) and or leg(s)
Acute watery diarrhoea	Any person with three or more loose stools within the last 24 hours
Acute haemorrhagic fever syndrome	Any person who has an unexplained illness with fever and bleeding or who died after an unexplained severe illness with fever and bleeding
Adverse event following immunization (AEFI)	Any unusual event that follows immunization
Cholera	Any person 2 years and above 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 (Dysentery)	Any person with diarrhoea, stomach pain and visible blood in the stool
Guinea Worm (Dracunculiasis)	Any person presenting a skin wound living in an endemic area or risk areas of Guinea worm, with a worm coming out
Hepatitis	Any person with fever and yellowing in the white part of the eyes
Animal bite (potential rabies)	Any person who is bitten by a dog, cat, bat or other animals
Influenza-like illness (ILI)	Any person with fever and cough or throat pain or runny nose
Leprosy	Any person with skin patch with loss of feeling
Malaria	Any person with fever or a history of fever in the previous 24 hours and or the presence of pallor (whiteness) of the palms in young children
Measles	Any person with fever and rash
Meningitis	Any person with fever and neck stiffness
Maternal death	The death of a woman while pregnant or within 42 days after delivery or loss of pregnancy

Neonatal death	Any death of a live newborn occurring before the first 28 complete days of life
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/fits.
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 (human)	Any person with change in behaviour (fear of water, hyperactivity, loss of orientation, barking, etc.) within 10- 14 days following a dog, cat, bat or any other animal bite
Sexually transmitted infections (STIs)	Any person with urethral/vaginal discharge or genital sores or pain
Tuberculosis	Any person with a cough of 2 weeks or more, for people living with HIV, current cough of any duration.
Typhoid fever	Any person with a prolonged fever during the previous 2 weeks or more
Viral haemorrhagic fever	Any person who has fever and two or more other symptoms (headache, vomiting, yellow eyes, running stomach, weakness of the body) or who died after serious sickness with fever or bleeding
Yellow fever	Any person with fever and two or more other symptoms (headache, yellowness of the eyes/other parts of the body, vomiting, running stomach, weakness of the body,) or who died after serious sickness with fever or bleeding
Unusual health events	• Two or more persons presenting similar severe illnesses in the same setting (for example, household, workplace, school, street) within one week • Two or more persons dying in the same community within one week with similar symptoms • Increase in number of animal sicknesses and/or deaths, including poultry, within one week • Any human illness or death after exposure to animals and animal products, including poultry (for example, eating, physical handling) • Any person who has been bitten, scratched, or whose wound has been licked by a dog, or other animal. • Two or more persons that pass watery stools and/or vomiting after eating/drinking at a given setting (for example, wedding, funeral, festival, canteen, food sellers, etc.) • Unexpected large numbers of children absent from school due to the same illness • Any event in the community that causes public anxiety

Annex 1B: Guide for Establishing Event-based Surveillance (EBS) at the National, State, LGA and Health Facility Levels

Event-based surveillance (EBS) is the organised and rapid capture of information about events that are of potential risk to public health. Information is initially captured as an alert which is considered by the Early Warning and Response system as an alert representing potential acute risk to human health, such as an outbreak. All alerts may not necessarily become real events, as such they all need to be triaged and verified before a response is initiated.

EBS provides the opportunity for early detection of events leading to timely response. It is therefore mandatory that EBS is established alongside IBS at all levels of the health system; namely national, state, LGA, ward/health facility and community levels.

The following are the description of the required steps for establishing EBS at the national, state, LGA and ward/health facility levels. (See Introduction Section for the description of EBS at community level).

I. Steps for Establishing EBS at the National, State and LGA Levels

Step 1: Establish EBS Hotlines and Media Scanning for Alert Detection

This step involves two major activities namely establishing EBS Hotlines and Media Scanning Centres as described below:

A. Establish EBS Hotlines

(a) A hotline is a phone line that the public can use to obtain information from an organization or to give the organization information. It is a short number to receive direct phone calls or information from social media platforms such as WhatsApp, Facebook, or Twitter.

(b) It should be toll free (The cost of reporting alerts to public health authorities should be zero).

(c) It is recommended to have a single number that can be used as a hotline to make reporting easy to remember. The same number can be used for hotline, Short Message Service (SMS) and social media platforms to avoid confusion. For example, if the hotline number is 499, messages sent by SMS or Facebook Messenger should also be sent to the same number.

(d) Community residents should be motivated to self-report events that may impact the public's health, including emerging public health events or outbreaks.

(e) Disseminate the hotline number by advocacy through health authorities, community health volunteers, non-governmental organizations, religious and other leaders, or schools and also advertise through messaging in local languages by TV, radio and newspapers.

(f) Develop partnership with communication companies that can spread the hotline number by text messages to their clients. The messages sent should include the purpose of the EBS, the importance of immediately reporting alerts and how alerts can be reported.

(g) Train a team of employees to operate the EBS hotline 24 hours to respond to calls or request information from the community.

The Call Methodology:

(a) The responder to the call should start by greeting and thanking the callers for their proactivity to report to the ministry of health or relevant ministry hosting the hotline, concerning potential public health events.

(b) Then the responder should follow a prepared set of questions that directly reflect the questions posed in the alert logbook.

(c) The call should be ended by thanking the caller for their time, patience and proactivity.

(d) The responder should directly register in the alert logbook the alerts that meet the pre-defined list of alerts.

(e) Calls should be returned as soon as possible in situations where a call is interrupted or disconnected or if calls are received while the responder is busy; this will ensure that all alerts are collected.

The Messaging Methodology:

(a) Once an SMS or a social media message is received, an instant automated message should greet the sender, thank the sender and state that an operator will contact them.

(b) Automated questions or responders can collect information from the sender.

(c) Data should be registered directly in the alert logbook according to the pre-defined list of alerts for the country.

(d) Information about the sender should be collected for further communication and details about the alerts reported. A direct call to the sender may be needed if more information is required.

Hotlines should be established at the National, State and LGA levels.

At the national level: The hotline with the call respondents can be established at the National Public Health Emergency Operation Centre (PHEOC) to capture and register alerts from the entire country.

At the State levels: The hotline can be established at the State Health Authorities premises or at the State PHEOC if available to capture and register alerts from the State.

At the LGA level: The hotline can be established at the LGA Health Authorities premises to capture and register alerts from the LGA including the health facilities and community focal persons.

B. Establish Media Scanning Centre

(a) Media are channels of general communication amongst a population and they act as gathering tools used to store and disseminate information or data, for example, newspapers, magazines, TV, radio, bulletins and other printed forms of communication, as well as electronic or online sources.

(b) Media scanning is an active process that should be performed using different media.

(c) Media scanning is recommended to be performed at the State and National levels.

(d) Train health personnel to conduct media scanning regularly, for example, daily.

(e) The sources of media scanning can be official and non-official.

(i) Official Media Sources:

Examples of official media sources:

- Websites of governmental sectors including, Ministries of Health, Agriculture, Environment, Foreign Affairs, etc.
- Websites for official organisations such as universities and internationally recognized centres of research.
- WHO Official websites for Early Warning, for example, WHO IHR Event Information Site for National Focal Points, which is a secured platform accessible only to national focal points.
- WHO Disease Outbreak News.
- Websites for WHO regional offices, for example, AFRO, EMRO, EURO, SEARO, WPRO, PAHO.
- Disease-specific websites, for example, Global Influenza Surveillance and Response.

Alerts detected from official sources are reliable and do not need further verification.

(ii) Unofficial Media Sources:

Examples of unofficial media sources:

- Newspapers and magazines
- Online content of TV and radio channels
- Social media, for example, Facebook, Twitter
- Unofficial websites, for example, ProMED, The Global Information Network (GPHIN), HealthMap, MEDISYS, etc.

Alerts detected through these sources are not reliable and need to be verified.

Methods of Online Media Scanning

Online information scanning can be done manually and automatically.

The Steps for Manual Scanning:

(a) Develop a checklist for scheduled (for example, daily) review of online sources.

(b) Develop a list of prioritized alerts regarding strategies, capacities and resources of the country.

(c) Develop a list for keywords related to the prioritized alerts including diseases, syndromes or events.

(d) Visit all predetermined websites in the checklist of online sources to scan for keywords.

Step 1: The Automated Scanning

(a) There are multiple automated technological tools that can be used for scanning of online information from pre-defined sources.

(b) These tools can save time and effort and support early detection of public health threats.

(c) Examples of automated scanning are:

  (i) Rich site summary (RSS feeds) are standardized software tools (e.g. Tatafo, EIOS) that monitor the predefined websites and inform the user with updates.

  (ii) Contributor-based sources are based on sharing information among health professionals, in which individuals collect information that can be accessed through shared feeds, for example, ProMed.

  (iii) Automated information feeds or services developed by governments or international organizations that collect health information from several sources and then can decrease time spent in scanning for individual sources. These are called data aggregators.

Step 2: Alerts Detection

(a) Alerts detection is the process of capturing information on the potential public health events reported to the hotline.

(b) Members of the general public may communicate with the hotline desk through phone calls, SMS, social media messaging or website chats.

(c) The hotline desk team should filter received notifications from callers to determine which alerts are valid.

(d) A list of alerts developed by national public health authorities should be provided to the hotline desk operators, or responders, so that they are able to continue with the registration of alerts.

(e) The call responder or operator should register valid alerts in an alert logbook.

(f) Alerts can also be detected by media scanning either manually or automated.

Examples of pre-determined alerts:

Code	Alerts to be reported
01	Two or more persons presenting a similar severe illness in the same setting (for example, household, workplace, school, street) within one week
02	Unexplained large number of deaths of poultry, livestock, other domestic animals or wildlife
03	Severe illness of a health-care worker after exposure to patients with similar symptoms
04	One or more hospitalized patients with unexplained severe illness, including failure to respond to standard treatment

Step 3: Registration of EBS Alerts

(a) Alerts that are captured from media and hotlines and correspond to the pre-defined list of alerts, should be registered in the alert book. See Sample Alert Logbook for Hotlines and/or Media Scanning below

(b) Each alert captured should include data about the alert's detection, triage and verification, until the response.

(c) Alert registration should include the minimum data set for tracking the alerts for example:

  (i) Source/informant: Name, contact phone and time and date of the call/detection.

  (ii) Alert: when it happened, who was affected (cases, deaths) and where it starts and spreads.

  (iii) Follow-up of the alert: Triage, verification, risk assessment and response.

Sample Alert Logbook for Hotlines and/or Media Scanning

ALERT LOGBOOK FOR HOTLINES AND/ OR MEDIA SCANNING [NB: This should be completed by The Call Responder/Designated Media Scanner]	
Variables	**Response**
1. Source of Information:	
(a) Source: CBS, EBS, Media Scanning, Hotline (This can be further categorized)	
(b) Reporter info: Employee at national team, community health volunteer, health-care worker, etc.	
(c) Date and Time: of detection/receiving alert (DD/MM/YYYY and HH:MM)	_ _/_ _/_ _ __ _ _:_ _
(d) Reference/Contact: Link, Contact name and Phone number	
2. Alert Information:	
(a) Alert Type: Human; Animal; Environmental	
(b) Alert: from the country's list of alerts	
(c) Location: details about the location that can follow the administrative levels	
(d) Date of start: when did this start	
(e) Cases: number of cases (f) Deaths: number of deaths	
(g) Description: narrative text for any further information, including any response activities (by community or health authority or someone else)	
3. Follow-up activities	
(a) Follow-up: Discard, Monitor, Verify Date-Time: DD/MM/YYYY/ HH:MM	_ _/_ _/_ _ __ _ _:_ _
(b) Sent for verification: Yes/No Date-Time: DD/MM/YYYY/HH:MM	_ _/_ _/_ _ __ _ _:_ _
(c) Verified: Yes/No Date-Time: DD/MM/YYYY/ HH:MM	_ _/_ _/_ _ __ _ _:_ _
(d) Risk Assessment: Very Low/Low/Moderate/High/Very-High	
(e) Sent to Response: Yes/No Date-Time: DD/MM/YYYY/ HH:MM	_ _/_ _/_ _ __ _ _:_ _
(f) Response Status: Not started; Ongoing; Completed Date-Time: DD/MM/YYYY/ HH:MM	_ _/_ _/_ _ __ _ _:_ _

Step 4: Conduct Triaging of EBS Alerts

Conduct assessment of alerts for verification

(a) If the alert matches with one of the priority alerts for the country, the alert should immediately undergo verification.

(b) If the alert is generically defined, for example, an unusual event that may pose a public health threat, a qualified public health specialist or team leader should assess the alert to decide whether to discard the alert, or to proceed for verification.

Step 5: Conduct Verification of EBS Alerts

(a) Verification is an essential step to confirm the validity of the captured alerts and should be conducted by subject matter experts, for example, public health specialist.

(b) Verification should be done at the local level nearest to the location of the alert.

(c) If the alert is detected at the national level, this is reported to the respective State focal point (State health Team) where the alert is located by phone call or SMS or email, etc.

(d) The State Health Team then notifies the respective LGA Health Team.

(e) Trained LGA Health Team with support from State/National experts should conduct verification of the alerts.

(f) All alerts should be verified within 24 hours.

(g) Once an alert is verified and requires action, it is determined to be an event.

(h) The LGA Health Team with support from State experts should promptly start investigations by collecting further information in the field (conducting physical examinations, collecting laboratory samples, etc.) using the existing respective IDSR case/event investigation forms.

(i) The confirmed events that meet the standard case definition should be captured by the respective LGA Health Team in the IBS system and reported to the next level of the health care system, through the existing IDSR data collection tools and follow the IDSR reporting procedures (refer to chapter 2)

Step 6: Conduct Aisk Assessment and Characterization

(a) Once an alert is verified as an event, risk assessment begins.

Risk assessment is a systematic and continuous process for gathering, assessing and documenting information to provide the basis for actions to manage and reduce the negative consequences of an acute public health event.

(b) The first risk assessment of an event should take place within 48 hours of the detection of one or more alerts.

(c) The National team should lead the risk assessment with the respective State health and LGA health team.

(d) Every assessment is a process by which the available information about a real event is analysed and judgement is made as to whether it poses an immediate risk to public health. In this case full risk assessment is done (refer to chapter 4)

For an alert that has been substantiated as a true event but does not pose an immediate threat to the public, the team should monitor the event and undertake risk assessments when new information becomes available

Steps for Establishing EBS at LGA Level

(a) The steps for establishing EBS at LGA level follow similarly as at the national level.

(b) However, the LGA level health authorities mostly receive EBS-related information in the form of alerts mainly from the health facilities and communities through phone calls/text messages/WhatsApp.

(c) Receive and document alert reports: Record verbal or written information from health facilities and communities about suspected outbreaks, rumours, unexplained events/alerts into the LGA log of suspected outbreaks (refer to chapter 4, Annex 4A).

(d) The district health team should carry out the following functions: triaging, verification and risk assessment.

(e) Triage alerts:

(i) When the LGA health team receive information about a reported alert, they should conduct triaging by asking the following questions:

- Is the reported information relevant to early warning (that is, could this alert be a genuine public health event?)
- Was this alert previously reported (that is, is this alert a duplicate?)

(ii) Triage can take place in person-field visit, by text messaging or over the phone.

(iii) After triage:

- If the report is not relevant or is a duplicate, then it can be discarded. There is no further action that is needed to be taken.
- If the information is to be discarded, communicate the following information to the EBS focal persons'/Surveillance focal persons who reported the alert:

  - They should continue to monitor the situation and notify the LGA if the situation changes and alert is met.

- It is proper that they have reported an alert that has been determined to be false alert, and they are encouraged to continue reporting alerts when they are detected.

- If the report is pertinent and is not a duplicate, then the information must be verified by the LGA health team that received the information about the alert.

(f) Verify alerts

(i) The LGA health team must verify all triaged alerts that are pertinent to EBS.

(ii) The LGA health team receiving alerts from health facilities and communities must also verify these alerts before they are determined to be events.

(iii) Verification is the determination that an alert is valid (that is, it is not a false alarm or a false rumour), reliable, and that it corresponds to at least one of the alerts pre-defined for EBS implementation.

(iv) Criteria for verification may include asking questions of those who have notified the alert to ensure that they have correctly understood the alert, whether or not the alert has been confirmed by at least two different sources, or the fact that the alert has been notified by a person with medical authority (for example, veterinarian, physician or laboratory assistant).

(v) To conduct verification, the LGA health team will ask questions of the person reporting the alert, and possibly other people as well. This can include the patient, the family and friends of the patient and/or other people within the community.

(vi) Verification can take place in person by field visit or over the phone.

(vii) Use the EBS verification tool; see sample of EBS Verification Tool on next page.

(viii) The result of verification is the confirmation that the alert is true or false. Once an alert is verified it becomes an event.

(ix) After verification:

- If the alert is considered to be a public health event, it is reported immediately to the State
- If the alert is not considered to be a public health event, the situation will be monitored to ensure that it does not become a public health event.
- Record confirmed events in existing IDSR data collection tools and platforms and report to next level (Refer to chapter 2)

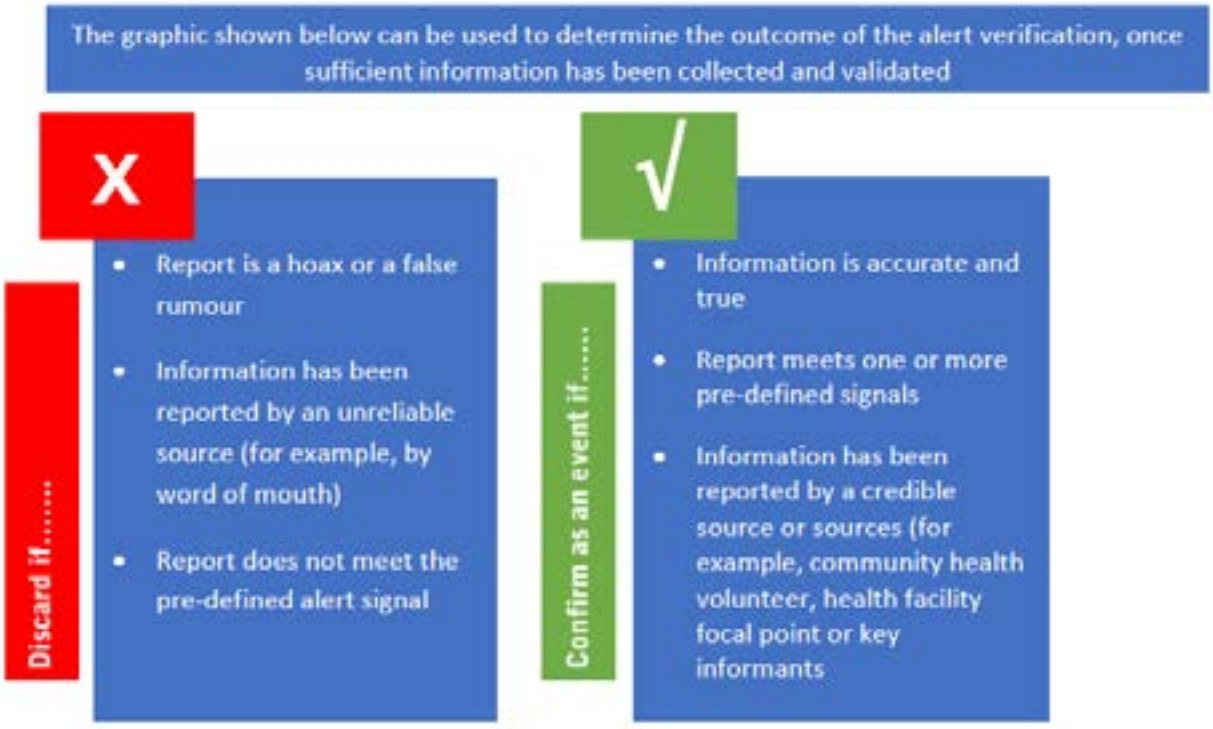
(g) Conduct Risk Assessment as directed in the national guidance.

Sample of Event-Based Surveillance: Verification Tool

When an alert is notified by a CBS Focal Person or health facility, the LGA Health Team will use this tool to verify whether the alert is TRUE or FALSE

The process of alert verification should answer three main questions:

(a) Is the report accurate (is it True)?
(b) Has the information been reported by a reliable source or sources?
(c) Does the report meet the criteria for one or more alerts?



Steps for Establishing EBS at Health Facility Level

(a) Indicator-Based Surveillance (IBS) in health facilities encompasses immediate, weekly or monthly reporting of a pre-determined list of diseases based on case definitions.
(b) Event-Based Surveillance (EBS) in health facilities (EBS) trains clinicians, nurses, and other relevant health-care professionals to report on a pattern of disease alerts, such as a cluster of illnesses and is not disease-specific.
(c) EBS may allow for detection of emerging or re-emerging public health threats because it is not disease-specific, requires immediate notification, and is highly sensitive and broad.
(d) Additionally, since reporting does not require laboratory results for reporting and relies on clinicians' experience, EBS is more practical and fairly simple to establish and sustain.
(e) Health facilities should participate in both IBS and EBS since the two complement each other leading to early detection of diseases, conditions and events.

Steps for Establishing EBS in Health Facilities

Step 1: Alert Detection

(a) Select and train EBS focal persons: Existing health facility surveillance focal persons can be trained to perform this role.

(b) EBS focal persons must inform other staff to immediately notify them when they see or hear about one of the alerts happening in their workplace.

(c) Health-care professionals including clinicians, nurses, and infection control officers should be sensitized to recognize alerts and report them immediately.

(d) Detecting an alert means identifying or suspecting the occurrence of the pre-determined alerts designated by national public health authorities.

(e) Examples of Health facility EBS alerts:

Code	Health Facility EBS Alerts to be reported
01	Any severe illness in health staff after taking care of a patient with similar illness
02	Large, sudden increase in admission for any severe illness of the same type
03	Any severe, unusual, unexplainable illness including a failure to respond to standard treatment
04	Increased use of a particular medicine

Step 2: Reporting Alerts

(a) Reporting alerts involves communicating with a EBS focal person/surveillance Focal Persons in the health facilities who intend report to the LGA team immediately.

(b) This can be done by telephone call, SMS, or in person, but it must happen immediately: on the same day and as soon as possible.

Step 3: Triaging and Verification

(a) The LGA health team upon receipt of report of alerts should triage and verify all alerts within 24 hours of alert detection using the verification tool.

(b) In case of true event, immediate investigations and response measures is implemented as per the existing IDSR structures.

(c) The LGA team should provide regular feedback to the reporting health facilities.

Annex 1C: List of LGA Reporting Sites

Record information for contacting the health workers or community health workers or PoE officers or anyone who provides information to the LGA related to surveillance and outbreak, events detection. Include, for example, community health workers, trained birth attendants, community leaders and public safety officials. This list is to be updated regularly to add new sites and delete non-functional 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 email (or other contact information)
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

Laboratory functions by health system level			
Level	**Collect**	**Confirm**	**Report**
Healthcare Facilities	Use standard case definitions to determine initiation of specimen collection process. Assist First Contact Laboratory in specimen collection within approved guidelines. Document specimens with clinical history. Transport specimens to First Contact Laboratory and Referral Laboratory as per approved guidelines, include the case-based laboratory reporting form	Use standardised case definitions to initiate or request appropriate testing for disease confirmation. Handle specimens within approved SOPs and guidelines.	Record details of specimen collection and transport. Receive test results and provide feedback.

State/LGA	Communicate collection policies and procedure to providers. Request additional specimen collection materials as needed. Store specimens per appropriate conditions pending transport or additional studies. Direct additional collection as needed based on outbreak investigation. Arrange for specimen transport to First Contact Laboratory and Referral Laboratory per approved guidelines, include the case-based laboratory investigation and reporting forms.	Perform laboratory studies for presumptive diagnosis as appropriate and available. Store representative samples for transportation in specified conditions as per guidelines. Carry out routine analysis of laboratory results. Routinely examine the laboratory analysis for changes in trends	Record, store and backup laboratory results and details of laboratory testing including all tests done and timeliness of analysis. Provide feedback of results to clinical staff and patients. Ensure regular receipt of Laboratory results from National level. Update line-lists with laboratory results and follow-up on any missing results with testing laboratory. Report results and timeliness details to next level. Report observed changes in trends during routine analysis of laboratory results to the national level. Use summary information for outbreak investigation
National Referral Labs (some labs may act as first contact labs and referral labs	Set specimen collection guidelines, policies and procedures with the national authorities. Distribute appropriate specimen collection and transportation kits for epidemic-prone diseases. Request for additional specimen to be collected by laboratory or providers as needed. Store specimens within approved conditions for further referral and analysis or additional research or investigation.	Set confirmation policies and procedures with the national authorities. Perform laboratory studies for confirmation as appropriate: • microscopy, culture, antimicrobial susceptibility testing, serotyping, serological investigation, molecular detections and identification, genomic sequencing. Store representative isolates from the outbreak as needed.	Record, store and backup laboratory results and details of laboratory testing including all tests done and timeliness of analysis. Report results to State/LGA Health Teams and all relevant stakeholders at the national, levels for onward dissemination to submitting health facility or laboratory. Report case-based and summary data according to the agreed protocol. Report laboratory results from screening sentinel populations at target sites. Carry out routine analysis of laboratory analysis, data and results and examine for changes in trends
Global Reference	Set specimen collection guidelines, policies and procedures, and share with the national authorities. Request for additional specimen to be collected, as needed.	Perform additional analysis on referred specimens or isolates as appropriate.	Record, store and back up laboratory results and details of laboratory testing including all tests done and timeliness of analysis. Report laboratory results to National Reference Laboratory or National Laboratory coordination team for onward dissemination.

Annex 1E: Responsibilities of Laboratory Focal Persons at All Levels

National Level Laboratory Focal Person

(a) Coordinate all laboratory related activities in support of disease preparedness, surveillance and response.

(b) Establish and support collaboration with epidemiologists/surveillance officers.

(c) Define laboratory testing capabilities in-country and those referred internationally and share this information with all stakeholders.

(d) Maintain an updated list of the laboratories performing required laboratory testing.

(e) Maintain and update list of inventory of supplies, reagents and equipment from all the laboratories.

(f) Establish agreements with international laboratories for provision of laboratory diagnosis or confirmation of priority diseases not yet available in the country and coordinate appropriately.

(g) Support the laboratory through advocacy with higher levels in accessing the necessary infrastructure, equipment and supplies to collect, handle, test, store, and ship specimens safely.

(h) Ensure that there is a sample transportation framework within the country and outside the country to facilitate sample transportation.

(i) Ensure that laboratory results are reported in a timely manner to all relevant stakeholders and used appropriately to inform public health action and patient clinical management.

(j) Ensure that there is a proper record for laboratory results.

(k) Ensure that the laboratories have a quality assurance programme to improve the reliability and reproducibility of laboratory results.

State Laboratory Focal Person

(a) Maintain an updated list of the laboratories that will perform required laboratory testing.

(b) Provide information to all health facilities for correct transport of specimens.

(c) Maintain and update list of inventory of supplies, reagents and equipment from all the laboratories in the State.

(d) Ensure that laboratory confirmation procedures established at the national level are known and followed in the State and LGAs.

(e) Ensure that specimen collection, transport materials and laboratory diagnostic tests are available to enable the timely detection of priority diseases.

(f) Coordinate with health facilities and laboratory in collecting, safely packaging and reliably transporting the appropriate specimen for confirming the suspected case.

(g) Receive results from the laboratory and promptly report them according to country procedures to all that require them for public health action and patient clinical care.
(h) Ensure that there is a proper record for laboratory results.
(i) Communicate with reference laboratory and National Laboratory coordinators as necessary.
(j) Ensure that the laboratories have a quality assurance programme to improve the reliability and reproducibility of laboratory results.

LGA laboratory focal person

(a) Establish or strengthen routine communication with identified laboratories that receive specimens and health facilities or LGA sending the specimens.
(b) Maintain and update list of inventory of supplies, reagents and equipment from all the health facilities and laboratories in the LGA.
(c) Ensure that procedures for sample collection, transportation, confirming the disease or condition and reporting the results are clear and can be reliably carried out in the designated places.
(d) Communicate with State laboratory focal person.
(e) Communicate with the national reference laboratory as required.
(f) Ensure that there is a proper record for laboratory results.
(g) Ensure that the laboratories have a quality assurance programme to improve the reliability and reproducibility of laboratory results.

Facility laboratory focal person

(a) Maintain and update list of inventory of supplies, reagents and equipment at the facility.
(b) Ensure that standard operating procedures (SOPs) for sample collection, transportation, confirming the disease or condition and reporting the results are available and being followed.
(c) Communicate with LGA laboratory focal person and State laboratory focal person as required.
(d) Ensure that there is a proper record for laboratory results.
(e) Ensure that the laboratory has a quality assurance programme (internal and external quality control) to improve the reliability and reproducibility of laboratory results.

Annex 1F: List of national laboratories for confirming priority diseases and conditions

Periodically update the list of laboratories in your State or those specified by the national level for confirming priority diseases and conditions. Include in the list whom to contact for assistance. The following list is an example.

Example:

Priority disease, conditions and events	Focal Person, Name of Lab, address, phone number, email
Polio	*John Audu; National Reference Laboratory. Gaduwa Durumi, Abuja*
Cholera	
HIV	
Tuberculosis	
Measles	
Plague	
Human influenza caused by a new subtype	
Rift Valley disease	
Dengue fever	
Public health events of national or international concern	
Anthrax	
Chikungunya	
Typhoid fever	

1.8 References

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2.0 Report Priority Diseases, Condition and Event

Integrated Disease Surveillance and Response (IDSR) is a system with the potential to ensure a reliable supply of epidemiological information to the national level in order to fulfil IHR (2005) requirements. Ensuring reliable reporting of surveillance data throughout the system is important. Reliable reporting provides information for surveillance officers, LGA, State or federal health authorities, epidemiologists, and competent authority at Point of Entry (PoE), programme managers, the national IHR focal point (NCDC), the WHO contact point and other health staff to:

(a) Identify emerging problems or conditions and plan appropriate responses, including informing relevant staff or levels

(b) Take action in a timely way

(c) Monitor disease trends in the area

(d) Evaluate the effectiveness of the response

This section describes how to report priority diseases, conditions and events within the required timelines. In IDSR, data collection and data reporting follow different timelines for different purposes:

(a) Immediate reporting of case-based information allows for early detection of unexpected or highly pathogenic/lethal public health events.

(b) Weekly aggregated reporting provides data for monitoring trends of diseases, conditions or events for early detection of outbreaks

(c) Only the aggregated reporting provides data for monitoring the health status of the population and impact of disease specific programmes, and for planning allocation of resources.

2.1 Immediate Reportable Diseases, Conditions and Events

Immediate reporting is indicated when an epidemic-prone disease or other potential Public Health Emergency of International Concern (PHEIC) is suspected or is otherwise required under the IHR (2005). Immediate reporting should also be done for diseases and events considered priorities which may not necessarily be PHEICs. The diseases, conditions and events requiring immediate notification to the next level are listed in Table 2.1

S/N	Immediate (Case based) Reporting	Weekly Aggregate Reporting	IDSR/ DHIS Aggregate monthly reporting	Immediate Reporting of unusal disease / event
1	Lassa fever	Malaria	Adverse events following immunisation (AEFI)	Ebola
2	Cerebospinal Meningitis	Thyphoid fever	Diabetes mellitus (new cases)	Dengue
3	Cholera	Acute viral hepatitis	Epilepsy	Anthrax
4	Measles	Non-neonatal tetanus	Hypertension (new cases)	Chikungunya
5	Yellow Fever	HIV/AIDS (new cases)	Sickle cell disease(New Cases)	MERS
6	Monkeypox	Schistosomiasis	Injuries (road traffic accidents)	Plague
7	Dengue	Soil transmitted helminths	Malnutrition in children under 5 years of age	Zika Virus
8	Acute flaccid paralysis/ poliomyelitis	Trypanosomiasis	Severe pneumonia in children less than 5 years of age	Influenza due to new subtype
9	Dracunculiasis (Guinea Worm Disease)	Diarrhoea with dehydration children less than 5 years of age	STIs	Unexplained cluster of illness/death from human or animal/bird
10	Leprosy	Diarrhoea with Blood (Shigella)		Any public health event of international concern
11	Lymphatic filariasis	Snake bite		All diseases or events of international concern
12	Tuberculosis			
13	Neonatal tetanus			**Diseases or event of international concern**
14	Noma			Human influenza due to new subtype
15	Buruli ulcer			SARS
16	Onchocerciasis			Smallpox
17	Pertusis			Zika virus disease
18	Diphteria			Yellow fever
19	Dog bites (Rabies)			Any public health event of international or national concern (infectious, zoonotic, foodborne, chemical, radio nuclear, or due to unkown condition).
20	Trachoma			
21	Yaws and endemic syphilis or bejel			
22	Rubella			
23	Maternal deaths			
24	Perinatal deaths			

Table 2.1: Diseases, conditions or events requiring immediate reporting

Immediate reporting allows timely action to be taken to prevent the re-emergence or rapid transmission of epidemic prone diseases or events or their propagation, especially those due to highly virulent infectious, chemical, biological or radio nuclear agents.

Information that is reported immediately, such as single cases or clusters of reportable events, will generate an alert and initiate a case-based reporting system. This means that, specific information about that suspected case, or, if it is a cluster, detailed information of each case identified and reported to the next level. At the same time, an initial investigation will be initiated. For events reported at PoE, information is reported to the next level (LGA DSNO in which the PoE is situated) as well as simultaneously to the State epidemiologist/DSNO and IHR NFP. Reporting units with no diagnostic capacity, will use the suspected case definition given to identify and report diseases, conditions and events. Additionally, samples from suspected cases will be collected by laboratory personnel and sent to designated laboratory and information of contacts will also be collected. (Chapter 4 describes how to conduct contact tracing and also how to report contacts.)

For conditions like maternal and perinatal deaths, the circumstances leading to the death need to be gathered and analysed for appropriate actions. Health providers should use the national Maternal Perinatal Death Surveillance and Response (MPDSR) guideline.

Examples of Clusters Can be:

- *any cluster of illness or deaths among people living in the same community within a specific time period (for example, one week)*
- *unexplained cluster of deaths of animals/birds within a specific time period (for example, one week)*
- *illness or death among people after exposure to animals*
- *health-care worker illness after exposure to patients with similar illnesses*
- *unexpected increases in admission to health care facilities of persons with similar severe symptoms*
- *sudden illness in persons who has travelled in the past 14 days*
- *any unusual illness or sudden death in the community within a specific time period (for example, one week)*
- *unexpected large numbers of children absent from school due to the same illness in the same seven-day period.*
- *unexpected large numbers of sales at pharmacies for the same kind of illness*

Ensure that adequate information is collected for events which are reported. Some of the events might have a link with the Agricultural or Livestock/ Wildlife sector or Food or Environment or other sectors ensure information is also sought from these sectors.

2.1.1 Report Immediate/ Case-based Information to The Next Level

If an immediately reportable disease, condition or other public health event is suspected, the health facility must report case-based information to the next level within 24 hours. Information that needs to be obtained through preliminary investigation of suspected case should include:

(a) Patient's geographical location

(b) health facility or facilities that managed or handled the patient or referred the patient

(c) Patient's identification and demographic information

(d) information about signs and symptoms, including date of onset, history of vaccination (where applicable) and information about any relevant risk factors including contacts

(e) Laboratory results (if available)

(f) Detailed history of travel within the last one month

(g) History of contacts (human or animal)

Any maternal or perinatal death, once it occurs, should also be reported immediately or within 48 hours of occurrence. (A sample reporting form for both is given in Annex 2K). Reference should be made to the national integrated Maternal Perinatal Death Surveillance and Response guidelines.

Process for reporting case based information

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

(b) Follow up the initial verbal report with a written report using a standardised case-based reporting form. (See annex 2F).

(c) Use the available electronic platforms of reporting for surveillance or case management to report to the next level. On electronic platforms, ensure protection of the patient's privacy by encrypting patient ID data so only few health staff can access the detailed information, or set up appropriate user rights such as creating a password when using a common office computer

(d) If a laboratory specimen is requested at this time, make sure that the patient's identifying information on the specimen, the laboratory investigation form, and the case-based reporting form all match. Ensure proper packaging for reliable results. Ensure also that a copy of the case-based form accompanies the laboratory form and the specimen. (See Annex 2G.)

(e) Disease-specific case-based reporting forms for particular diseases and conditions of concern (for example, AFP, cholera, VHF, maternal death, and MDR/XDR TB) are in the annex at the end of Chapter 11. These forms may be used to begin gathering initial information for the case investigation

(f) Some diseases and event for case based reporting like Maternal or Perinatal deaths have specific reporting requirements. Please refer to disease-specific conditions and requirements in chapter 11

(g) Ensure that adequate information is available for events which are reported, as some events might have a link with the Agricultural/ Livestock, Wildlife, Food, environment or other sectors including the community. Such information sharing is crucial and should start at the community level, health facility and subsequently at the LGA and State. At the National level, the IHR National Focal Point (NFP) should notify WHO of an event that is a potential public health emergency of international concern (PHEIC) using the decision instrument in the IHR 2005 (Annex 2A).

(h) For all events, establish a line listing of suspected cases, events or conditions reported as part of initial and ongoing investigation. Ensure it is always updated, while at the same time maintaining the link with appropriate sectors, depending on a particular disease or event. The line list should be kept where there is a suspected outbreak and where an isolation unit has been opened. However, if several isolation units have been opened, the LGA should maintain a combined line list. (See Annex 4E for a sample line list).

2.1.2 Notifying a Potential Public Health Emergency of International Concern Under IHR 2005

If a potential Public Health Emergency of International Concern (PHEIC) is suspected (as defined in Annex 2 of the IHR 2005), the LGA DSNO should report immediately using the fastest means of communication and to notify the State epidemiologist/State DSNO. If a potential PHEIC is detected at PoE, immediate reporting should be made to the National IHR Focal Point, while at the same time notifying the LGA and State (See Annex 2B for a framework of reporting).

2.1.3 Reporting Events from Community Sources

Any suspected event occurring in the community, including maternal and neonatal events, should be reported immediately. The trigger mechanisms of reporting must be clearly defined and the information must be immediately notified to community informants, if already identified, or to a nearby health facility or LGA DSNO. Minimum information to be collected should include:

(a) Date of event and date of report
(b) Suspected disease, condition and event
(c) What happened?
(d) When did this happen? (day, month, year)
(e) Where did this happen? (Exact location, Village, Ward/LGA/State)
(f) Who is affected? (age, gender, occupation, etc.)
(g) How many have been affected?
(h) Has anyone died? If yes, how many?
(i) Is the event ongoing?
(j) Are there any animal deaths/exposures?
(k) Recent history of travel
(l) Other information you may have
(m) Name and contact number of the person reporting
(n) Any action taken

See Annex 2C for a reporting format when an event is identified, Annex 2D for monthly summary and Annex 2E for reporting structure for community alert and verification of events from community sources.

2.2 Weekly Reporting

Weekly reporting provides data for monitoring trends of diseases or conditions to early detect outbreaks. Ensure that the weekly reporting form is adhered to across all health facilities and LGAs to facilitate comparison within and between the facilities and LGAs as well as for other weekly reported priority diseases, conditions and events, as listed in Table 2. 2See Annex 2H for the weekly summary form for aggregate reporting.

With SORMAS (see chapter 9), this will be updated automatically in the database, and cases reported using paper-based tool will be entered manually into an electronic database. This aggregation is important to understand the trend of the immediate reportable diseases and plan for effective intervention. For early detection of outbreaks via weekly aggregated reporting, keep the number of variables at a minimum, ideally reporting only the number of cases and deaths, to avoid unnecessary burden on the health care facilities and maximize reporting efficiency.

Based on epidemiological evidence, States should include additional diseases, conditions and events in diseases for weekly reporting, for example, malaria, diarrhoea with severe dehydration in children under five years of age, severe malnutrition, and neonatal deaths. Only diseases or conditions or events which could result in public health action should be considered for entry on the list of aggregated weekly reporting.

Table 2.2 Diseases and conditions Requiring Weekly Reporting

S/N	Weekly Aggregate Reporting
1	Malaria
2	Typhoid fever
3	Acute viral hepatitis
4	Non-neonatal tetanus
5	Schistosomiasis
6	Soil transmitted helminths
7	Trypanosomiasis
8	Diarrhoea with dehydration in children less than 5 years of age
9	Diarrhoea with Blood (Shigella)
10	Snake bite

2.3 Report Monthly and Quarterly Routine Summary Information for Other Diseases of Public Health Importance

At a minimum, report summary data about other endemic diseases to the next level each month. This information is valuable to disease-specific programmes and can be used when monitoring progress with prevention and control activities as well as for detecting any emergent, unexplained or unusual events or disease patterns.

The LGA DSNO and State Epidemiologist should routinely report the total number of cases and deaths seen in a given period (monthly) for other diseases of public health importance. All health facilities including referral or tertiary hospitals should report summary totals to the LGA under their catchment area. LGAs should aggregate reports from all reporting sites and provide summary totals to the State and from State to the national. Each level should observe any unusual increases or events seen during analysis of monthly summary reports. The summary results should be analysed and the results used to monitor progress towards disease control targets, measure achievements of disease-prevention activities in the LGA and State, and identify hidden outbreaks or problems so that a response action can be taken.

S/N	IDSR/ DHIS Aggregate monthly reporting
1	Adverse events following immunisation (AEFI) * clarify
2	Diabetes mellitus (new cases)
3	Epilepsy
4	Hypertension (new cases)
5	Sickle cell disease(New Cases)
6	Injuries due to road traffic accidents
7	Malnutrition in children under 5 years of age
8	Severe pneumonia in children less than 5 years of age
9	HIV/AIDS (New Cases)
10	STIs

Table 2.3: Diseases and conditions Requiring Monthly Reporting

Each month, the health facility should calculate the total number of cases (suspected and laboratory-confirmed) and deaths due to priority diseases, conditions and events seen in the health facility. Separate totals are calculated for outpatient cases and inpatient cases. The summary totals are recorded on a form (see Annex 2H) and sent to the LGA level. The LGA aggregates the totals from all the health facilities that reported and submit LGA summary totals to the state level

Special effort should be made to obtain from the health information system, the total number of outpatients and inpatients seen for any health condition (including those not in the IDSR list) during the reported period. On a regular basis (weekly or monthly), review the overall Health Management Information System (HMIS) to ensure that data has been well captured. At least once every month, data validation needs to occur, and periodic edits should be conducted before transmission to the next higher level.

Patient records should be analysed to generate the weekly or monthly reports as may be required. This information is important for producing national and sub-national situation reports. All datasets should be shared with the health authorities with a copy to the respective disease prevention and control programme this is important for coordination at the federal level, and for the building or strengthening of a national IDSR database system.

Depending on each level of laboratory services, laboratory data should be organised in a register so that it can generate monthly summaries. Laboratory data should be updated on SORMAS. During outbreaks, submission of the weekly summaries of the specimen processed, the types of specimen and the results should be done to assist in completion of the variables in the line list. Efforts should be made to also update the laboratory component of the IDSR data and linked to epidemiological/clinical data.

2.4 Zero Reporting

If no case of reportable disease(s) has been detected during the week, 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 be able to develop information from a blank space. Submitting a zero report for each immediately reportable disease when no case is detected during the week tells the staff at the next level that a complete report has been filled.

2.5. Summarise Immediate and Cased-based Reportable Diseases

After an initial case has been detected or an outbreak is suspected or confirmed, summary data are important for analysis and monitoring. For example, at the health facility or LGA, the surveillance focal point can draw an epidemic curve to see if and when the epidemic thresholds for specific diseases have been crossed. Additionally, these data from epidemic investigation can be used to check whether the case-fatality rate is below, at or above the expected target. The weekly data analysis of the suspected or confirmed epidemic should also help point out possible high-risk groups with regard to a case location or residence, age group, sex, and exposure during social events (for example, a funeral), occupational hazards (for example, butchering), consuming game meat, or exposure to a contaminated food or beverage.

At the LGA level, weekly data analysis includes verification of the quality of the data coming from the health facilities and the completeness and timeliness of these reports. For SORMAS, the LGA DSNO should be responsible to ensure that data verification is done and approved for further transmission. Additionally, an in-depth analysis of individual immediate case-based reporting forms received from the health facilities will also be performed, in addition to the weekly aggregated data. The incidence and case-fatality rates should be calculated and compared with the set alert and epidemic thresholds to determine if it is increasing or decreasing. Epidemic curves should be updated regularly to monitor the trends or evolution of epidemics occurring in the LGAs. LGA DSNOs should store the information electronically and forward the surveillance data sets to the next level in this format.

2.6 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/Electronic Medical Record (EMR). Later in the day, a nurse tallies the number of cases and deaths seen in an outpatient service. The ward nurse tallies the number of admitted cases. Where EMR is being used, cases and reports can be generated electronically.

Each week, month, or quarter, a record clerk or statistician calculates summaries for all the diseases and records them in a standard form. Events should be aggregated separately from diseases. In case the health facility is equipped with computers, individual patient records should be entered, from which the IDSR priority diseases or conditions subset will be extracted and analysed to get the required weekly or monthly compilations.

In outbreak scenarios, isolation units that are separate from health facilities can be opened, and use a different register to record diseases or events. It is important that this information be captured in the overall IDSR weekly or monthly summaries.

2.6.1 Flow of Information at the Reporting Site

During supervisory visits to reporting sites, ensure that:

(a) all reporting sites including secondary and tertiary hospitals in the catchment area of your LGA are visited

(b) clinicians record legibly information in the patient registers using the recommended case definitions so that health workers who tally the cases at the end of the day can reliably record the required diagnoses on the tally sheet.

(c) clinicians, ward nurses or other responsible staff should complete the case-based reporting form preferably while the patient is still present.

(d) clinicians record laboratory results in the patient registers

(e) in health facilities with laboratories, laboratories should record results of IDSR priority diseases in the laboratory registers with linkage to epidemiological data

integration of laboratory results into the IDSR reporting forms should be conducted at the health facility level

(f) record clerks or statisticians have summary forms that contain spaces for recording cases and deaths due to the priority diseases or conditions according to the standard case definitions

(g) health staff review the weekly and monthly IDSR data summary totals and provide comments on the forms about results seen during data analysis. (See chapter 3)

(h) health workers record the summary totals on a recommended weekly and monthly IDSR summary reporting forms (See Annex 2G)

2.6.2 Data Management

Keep a record of IDSR forms, notifications and reports received at each level. The record kept is an essential data source for calculating indicators for Nigeria's IHR report and for monitoring performance of the IDSR indicators. A sample IDSR Reports and Data Sharing Log Book form is in Annex 2I.

Periodically check with reporting sites supervised (community, health facility, ward/LGA) to ensure that the correct forms and procedures are available to staff so the required cases of priority diseases and conditions are recorded and reported:

(a) Take steps to ensure that all health workers know or have access to the standard case definitions recommended by national policy. Establish or modify existing procedures so that all health workers are able to apply the standard case definitions in detecting and reporting priority diseases, conditions, outbreaks or events

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

(c) Review with health workers 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. Ensure health workers have access to standardised forms for reporting case-based information

(d) Ensure that the surveillance unit has access to fast communication means (fast internet connection, telephone, text message, electronic mail, telegrams messages app, or other rapid communication means). For the LGA, specify how the LGA should notify the State or national levels and who should be contacted at these levels

2.6.3 Conduct Data Quality Assessment

While each provider may have some preferred methods for filling in forms, describing diseases, or abbreviating terms, it is important for every level of reporting (facility, LGA, State, or National) to use a standard approach for recording and reporting, as data that are not comparable, will lead to inappropriate decisions.

Some of the examples of factors which may affect data quality that needs to be periodically checked include:

(a) Poorly completed forms (missing values, etc.)

(b) Incomplete forms (for example, presence of blanks)

(c) Under-reporting or over-reporting of cases

(d) Duplicate reporting

(e) Unsystematic data collection and reporting

(f) Untruthful reporting, (for example, reporting zero, while there is an ongoing outbreak of epidemic prone diseases)

(g) Inconsistent reporting formats (forms)

(h) Late submission or reporting

(i) Inconsistent reporting periods

(j) Calculation errors on aggregate reports

(k) Lack of documentation and source data or files are lost

During supervision, reiterate the importance of data quality and surveillance, regular data quality audits at all levels should be conducted.

(See Annex 2J for checklist on key elements to assess in data quality audits).

2.6.4 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 LGA health department. In this system, community informants/agents and other community based agents identify and report events in the community that have public health significance. The community informants and agents report to the health facility, or in the case of a serious event, directly to the LGA authorities.

Community Representatives that Can be Members of CBS Team

Any community member acceptable by the community can be a community informant or agent. Once selected, the community informants/agents should receive training and carry out supportive supervision on how to recognise certain diseases or health conditions for the purpose of reporting suspected cases.

Example: Community informants or agents hear of several cases of acute watery diarrhoea with vomiting in the community. The informant suspects cholera and reports the alert to the local health facility and to the LGA level health officer by text messaging. Members of the public health emergency 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 system.

LGA staff may identify sources in the community with opportunity to know about the community's health status. Examples of community sources include:

(a) Chemical Sellers
(b) School teachers
(c) Staff at private clinics
(d) Village leaders
(e) Religious leaders
(f) Traditional healers

(g) Birth attendants.
(h) Community health workers
(i) Community animal health workers
(j) Community Based Organizations (CBOs)
(k) Other societal leaders
(l) Veterinary health workers
(m) Any individuals involved in neighbourhood watch or other active surveillance approaches
(n) Other community resource persons
(o) Patent medicine vendor

Depending on the event, resource availability and the context, state may choose their source of information. The LGA can organise community-based surveillance focal points by:

(a) working with community leaders to identify members of the community to receive relevant training
(b) train and provide job aids (for example, Community Registers, leaflets of case definitions, etc.) on priority diseases and public health events or hazards to community health informants. 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
(c) involve community informants/agents in risk mapping, emergency simulation exercises and risk communication during outbreaks
(d) ensure that the community informants gives regular and timely feedback of diseases/events reported from the community level. LGAs need to ensure that there is sustained commitment by community informants/agents and hence continuously engage them
(e) disseminate alert and epidemic thresholds

Refer to the list in Annex 1B of key signs and symptoms to use in case definitions for community surveillance.

2.6.5 Strengthen Linkages Between Laboratory and Surveillance Information

Public health laboratory system complements the syndromic disease surveillance.

(a) in case of a public health event, the laboratory where confirmation took place is to report the laboratory results as soon as the confirmation has been done to the respective health facility, and simultaneously to the LGA, State as well as National level

(b) to strengthen the linkages between epidemiological and laboratory data, the case reported and the laboratory samples should have the Epid ID

(c) submission of the weekly summaries of the samples processed, and the types of samples, as well as the results, should be done whenever there is an outbreak, to assist in completion of the variables in the line list

(d) during supervision at reporting sites, liaise with the Laboratory Focal Person to ensure that the laboratorians record data correctly for diseases under surveillance and an established laboratory register is maintained

(e) make sure that the test results are linked with IDSR data at national, state and LGA levels

(f) the laboratory component of the IDSR weekly or monthly Summary Reporting should be regularly updated immediately the respective disease laboratory results are ready

(g) liaise with the animal sector, so as to have a comprehensive report from the veterinary laboratory, especially if they have recorded any animal information which might have risks to public health.

2.6.6 Promote a Multisectoral One Health Approach With Effective Involvement From Human, Animal, and Environmental Health Sectors as Wells as Other Relevant Sectors to Strengthen Reporting

Ensure implementation of the One Health approach to improve reporting of public health risks across all levels, with emphasis also at the community level. Strengthening the technical and community capacities of staff for all relevant sectors (including physicians/nurses, veterinarians for livestock or wildlife and environmental inspectors) should be done.

2.7 Data protection and Security to Protect Patient's Confidentiality

The public health community recognises that there might be risks to both individuals and communities, if one uses name-based reporting of private health-related information.

To ensure protection of patient confidentiality and privacy, when reporting, use unique identifiers such as numbers instead of names and this will prevent identities from being inadvertently disclosed. The identifiable data should however be maintained where public health surveillance interventions occur and it is usually at the health facility level. LGAs need to have guidelines on privacy and security of health data, which should be guided by the national level guidelines.

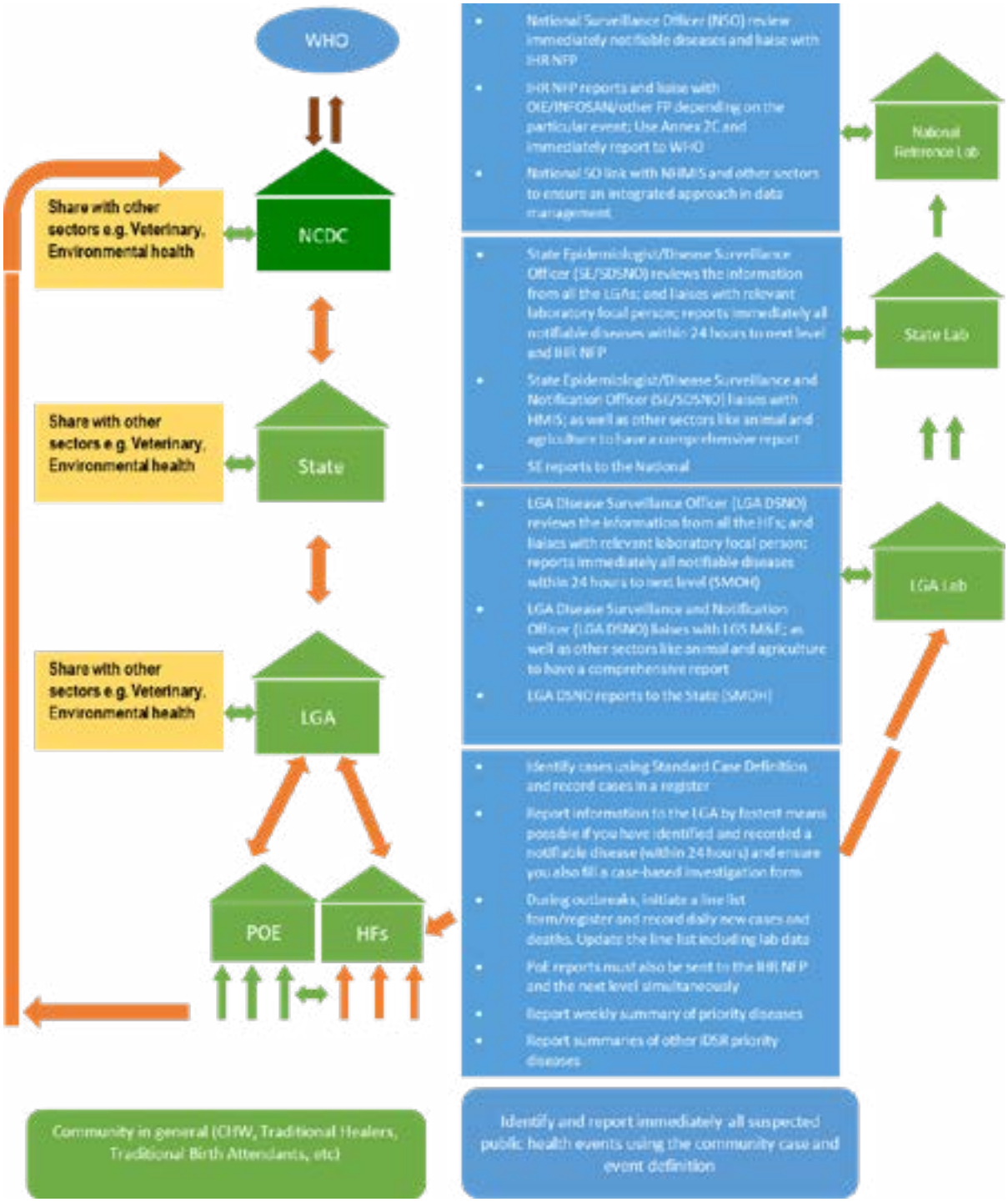
Use of names may be required during an outbreak of infectious diseases for the purpose of contact tracing. Refer to chapter 4 on contact tracing and recording.

2.8 Annex to Chapter 2

Annex 2A	Algorithm of reporting immediate notifiable events/diseases
Annex 2B	Community Alert Form for reporting of events from community sources
Annex 2C	Community-Based Surveillance Suspected Diseases and Public Health Events Monthly Log Sheet
Annex 2D	Reporting Structure for community alert and verification
Annex 2E	IDSR immediate case-based reporting form
Annex 2F	IDSR case-based laboratory reporting form
Annex 2Gi	IDSR Weekly Reporting Form: HF
Annex 2Gii	IDSR Weekly Reporting Form: LGA
Annex 2Giii	IDSR Monthly Reporting Form
Annex 2H	IDSR reports and data sharing log book
Annex 2I	LGA level IDSR Data quality checklist
Annex 2J	Maternal deaths, Perinatal deaths reporting form, and Still and neonatal deaths summary reporting form

Please refer to http://ncdc.gov.ng/idsr_forms for samples of these forms

Annex 2A: Algorithm of Reporting Immediate Notifiable Diseases/Conditions/Events



Annex 2B: Community Alert Reporting Form

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

Instructions: This form is completed by the COMMUNITY INFORMANTS/AGENTS focal person and submitted immediately to nearest health facility/sub-LGA surveillance focal person when he or she identifies disease (s) or public health event as per the community case definition. It is also completed for unusual health events/alerts that are not captured by the given case definition.

Community alert reporting form **[Send this form immediately to your supervisor or nearby health facility]**	
1. Name of COMMUNITY INFORMANTS/AGENTS focal person reporting:_____	
2. Telephone number:_____Community_____LGA_____	
3. Date reporting (day, month, year)__ __/__ __/__ __ __ __	
4. Type of illness/Condition/Event/Alert (please describe): _____	
5. When did this happen (Date: Day/Month/Year); Time	__ __/__ __/__ __ __ __
6. Date/time this was detected (Date: Day/Month/Year); Time:	__ __/__ __/__ __ __ __
7. Where did this happen? **(Location: community, ward/LGA, LGA)**	
8. How many people have been affected?	
9. Has anyone died? If yes, how many	
10. Are there sick or dead animals involved?	
11. Is the event ongoing as at the time of this report?	
12. What action has been taken?	

Annex 2C: Community-Based Surveillance (COMMUNITY INFORMANTS/AGENTS) Suspected Diseases and Public Health Events Monthly Log Sheet

Instructions: This form is a line listing of all the diseases/events/alerts identified during the month. It is completed by the COMMUNITY INFORMANTS/AGENTS focal person and submitted monthly to nearest health facility/sub-LGA surveillance focal person every month.

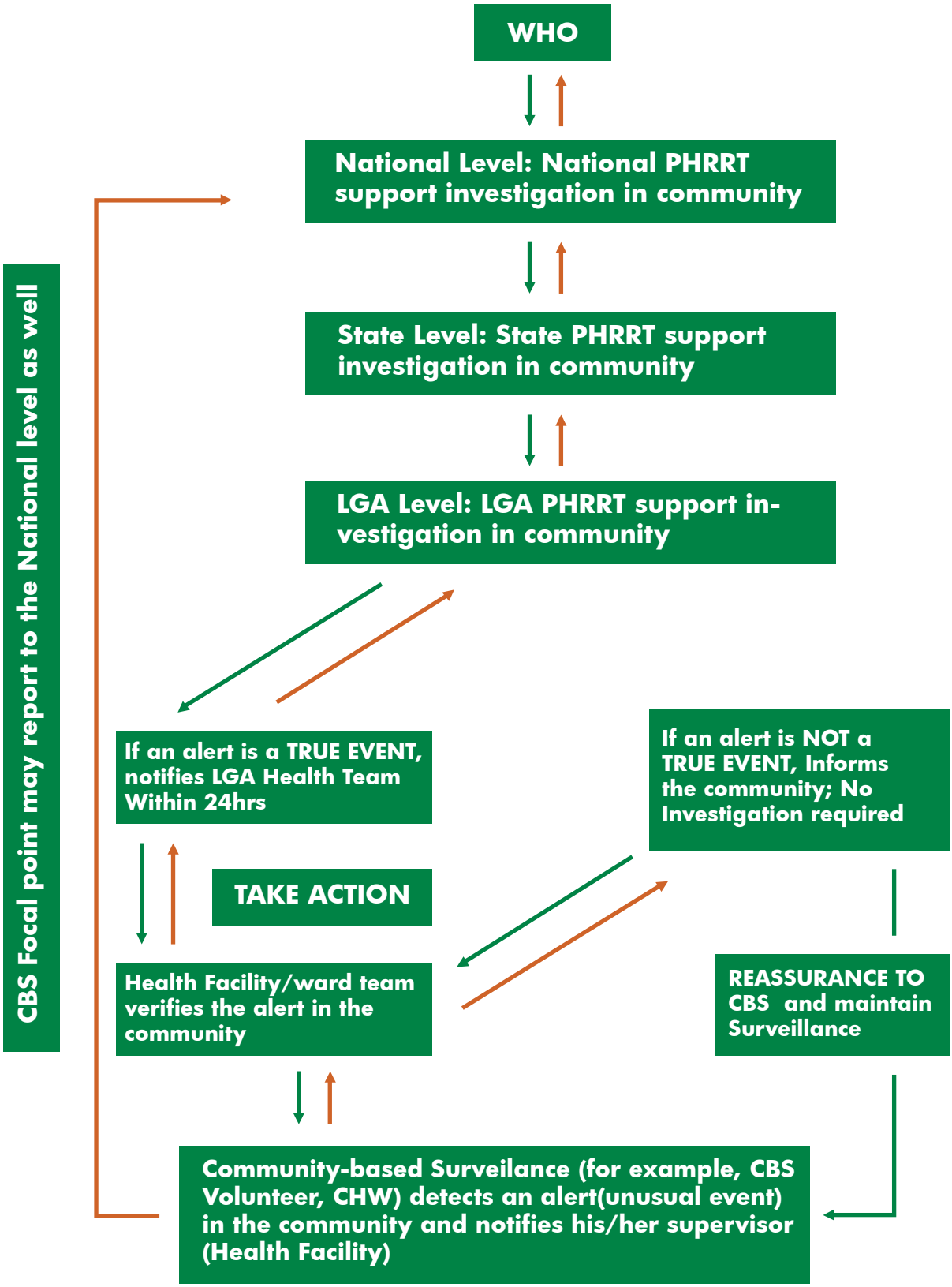
Community-Based Surveillance Suspected Diseases and Public Health Events Monthly Log Sheet

LGA_____Ward/SubLGA_____

Community:_____Month_____ Year_____

Serial Number	Type of illness/ Condition/ Event/Alert	When did this happen? (DD/MM/YYY)	Where did this happen? (Community, LGA)	How many have been affected?	How many died?	what action was taken?

Annex 2D: Reporting Structure for Community Alert and Verification



Annex 2E: IDSR Immediate Case-based Reporting Form

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

Acute Flaccid Paralysis/Poliomyelitis (AFP)	Buruli ulcer	Cholera	Diphteria	Dracunculiasis (Guinea Worm)	Dengue	Influenza due to new subtype e.g H5N1	Leprosy	Lymphatic Filariasis	Maternal deaths	Measles	Meningitis	Monkey pox	Neonatal Tetanus (NNT)	Noma	Onchocerciasis	Perinatal deaths	Pertusis	Rabies (Dog bite)	Rubella	Trachoma	Tuberculosis (TB)	Viral Hemorrhagic Fever e.g. Lassa fever	Yaw & endemic syphills or bejel	Yellow Fever	Others/specify* e.g.Ebola, MERS SARS, Small pox, Plague, Anthrax, Plague, Zika Virus, Chikungunya etc

Date form received at SMOH or the national level:		/ / (Day/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 (dd/mm/yyyy):	/ /		**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:	/ / (Day/Month/Year)	Date Form Received at LGA:	/ / (Day/Month/Year)	Signature:			

Annex 2F: IDSR Case-based Laboratory Reporting Form

Lab Specimen Collection/Reporting Form (for Immediate Case-based Surveillance) IDSR 001B					
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	Others (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. Falciparum				
	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)				
	Dengue (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: ____/_____/______					

Annex 2Gi: IDSR Weekly Reporting Form: HF

LGA LEVEL

ROUTINE WEEKLY NOTIFICATION FORM: IDSR 002

Reporting LGA		State		Total No. of Health Facilities (HFs)		LGA Reporting Status	(T / L/ N)
Reporting Week		Year		HFs Reporting Timely		HFs Reporting Late	HFs Not Reporting

		Suspected cases								Lab confirmed cases								Deaths							
SN	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	0-28 days	1-11 months	12-59 months	5-9 years	10-19 years	20-40 years	>40 years	Total
1	Acute Viral Hepatitis																								
2	Diarrhoea with dehydration (< 5yrs)																								
3	Diarrhoea with blood (Shigella)																								
4	HIV/ AIDS (New cases)																								
5	Human African Trypanosomiasis (HAT)																								
6a	Malaria																								
6b	Malaria (severe)																								
6c	Malaria (Pregnant Women)																								
7	Non-neonatal Tetanus																								
8	New HIV/ AIDS cases																								
9	Schistosomiasis																								
10	Snake Bite																								
11	Soil transmitted helminths																								
12	Typhoid fever																								

Name of Reporting Officer

Signature

Date

Annex 2Gii: IDSR Weekly Reporting Form: LGA

HEALTH FACILITY LEVEL

ROUTINE WEEKLY NOTIFICATION FORM: IDSR 002

Reporting Health FacilitY (HF) _____ LGA _____ State _____

Reporting Week _____ Year _____

		Suspected cases								Lab confirmed cases								DEATHS							
SN	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	0-28 days	1-11 months	12-59 months	5-9 years	10-19 years	20-40 years	>40 years	Total
1	Acute Viral Hepatitis																								
2	Diarrhoea with dehydration (< 5yrs)																								
3	Diarrhoea with blood (Shigella)																								
4	HIV/ AIDS (New cases)																								
5	Human African Trypanosomiasis (HAT)																								
6a	Malaria																								
6b	Malaria (severe)																								
6c	Malaria (Pregnant Women)																								
7	Non-neonatal Tetanus																								
8	New HIV/ AIDS cases																								
9	Schistosomiasis																								
10	Snake Bite																								
11	Soil transmitted helminths																								
12	Typhoid fever																								

Name of Reporting Officer _____ Signature _____ Date _____

Annex 2Giii: IDSR Monthly Reporting Form

HEALTH FACILITY LEVEL

ROUTINE MONTHLY NOTIFICATION FORM: IDSR 003

Reporting Health Facility (HF) _____ **LGA** _____ **State** _____

Reporting Week _____ **Year** _____

		Cases out-patients								Cases in-patients								Total cases in & out patient	DEATHS							
SN	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		0-28 days	1-11 months	12-59 months	5-9 years	10-19 years	20-40 years	>40 years	Total
1	**Sexually Transmitted Infections (STIs):**																									
1a	Vaginal discharge																									
1b	Genital Ulcer																									
1c	Urethral discharge																									
1d	Others STIs																									
xx	**NON-COMMUNICABLE DISEASES / CONDITIONS / EVENTS**																									
2	Adverse Events following immunization																									
3	Diabetes Mellitus (New cases)																									
4	Hypertension																									
5	Injuries (Road Traffic Accident)																									
6	Malnutrition in children under 5 years of age																									
7	MNS Disorder (Epilepsy, Schizorphernia depression etc)																									
8	Severe pneumonia in chlidren under 5 years of age																									
9	Sickle Cell Disorder (New cases)																									

Name of Reporting Officer _____ **Signature** _____ **Date** _____

Annex 2H: 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 Paediatric bacterial Meningitis surveillance data; Monthly; Measles and yellow fever laboratory data; Monthly Measles, yellow fever and NNT case-based data; Monthly Bacteriology laboratory 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 epidemiological 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

Annex 2I: LGA Level IDSR Data Quality Checklist

LGA Level IDSR Data Quality Audit Checklist				
Name of Reporting Officer: _____				
Contact Phone Number: _____ **E-mail:** _____				
Health Facility: _____ **LGA:** _____				
Region/State: _____ **Date:**____ ____/____ ____/_____				
Persons Met and Title				
CORE ACTIVITY	**THINGS TO LOOK FOR IN THE FACILITY**			**NOTES**
	General			
1. DATA COLLECTION TO IDENTIFY SUSPECTED CASES WITHIN HEALTH FACILITY	1. Is there an information flow for reporting to the LGA level (diagram or description)?			
	2. How frequently do you review and collect data (for example, daily, weekly, monthly)?			
	3. Is there a list of the country's notifiable diseases?			
	4. Is there a list of priority reportable diseases/conditions/events?			
	5. For each priority reportable disease, condition or event, does this facility have case definitions for suspected and confirmed cases?			
	6. Priority Reportable Diseases/conditions/events with case definitions			
	Disease (examples only. Please modify list for your setting.)	Yes	No	**Notes**
	AFP (Suspected Polio)			
	Tuberculosis			
	Viral Haemorrhagic Fever, for example, Ebola			
	Yellow Fever			
	Monkey Pox			
	Others: specify			
	Case-Based Reporting or Line List Form, IDSR weekly/monthly summary forms			
	1) Is the cased-based form or line listing form or IDSR weekly/summary form paper-based or electronic?			
	2) If paper-based, do you have adequate supply of case-based reporting or line listing forms?			
	3) Is your facility using them?			
	4) Do you get feedback about the final diagnosis?			

Annex 2I: LGA Level IDSR Data Quality Checklist

Thoughts on possible problems in data collection process Examples: • Unsystematic data collection and reporting procedures due to HCW not knowing • Lack of laboratory results due to lack of feedback from higher levels or from the requested laboratory	**List possible causes of omissions or problems.**	
	List recommended solutions, including target date and person responsible	
2. RECORDING OF CASES	1. For suspected cases, what material is reviewed to determine suspected cases (for example, patient chart/folder/card, facility record, case-based form, line list)?	
	2. For suspected cases, how was diagnosis assessed (for example, laboratory confirmatory tests, patient signs and/or symptoms, patient history, or consultation)?	
	3. Are priority reportable diseases recorded in the health facility register or facility line list according to the country	
	4. Select randomly 3 priority diseases; verify how they are diagnosed and recorded	
Thoughts on possible problems in recording of cases, for example: Lack of documentation/recording Data or files are lost Poorly completed forms (missing values, forms not filled, presence of blanks, etc.).	**List possible causes of omissions or problems**	
	List recommended solutions, including target date and person responsible	

Annex 2I: LGA Level IDSR Data Quality Checklist

<table>
<tr><td rowspan="15">3. REPORTING</td><td colspan="3">1. Who is responsible for reporting priority reportable diseases (healthcare provider, laboratory, institution)?</td><td></td></tr>
<tr><td colspan="3">2. When was the last time a supervisor made a site visit to your facility?</td><td></td></tr>
<tr><td colspan="3">3. How often do you report information to the next level?</td><td></td></tr>
<tr><td colspan="3">4. Is there a standard method for reporting each immediate reportable disease?</td><td></td></tr>
<tr><td colspan="3">5. Is there a standard method for summary reporting each priority disease?</td><td></td></tr>
<tr><td colspan="3">6. Is there a standard method of reporting an outbreak?</td><td></td></tr>
<tr><td colspan="3">7. Is the report case-based or aggregate format?</td><td></td></tr>
<tr><td colspan="3">8. Is the reporting protocol process mapped out or summarized in narrative format and readily visible in the facility (for example, on the wall)?</td><td></td></tr>
<tr><td colspan="3">9. For priority diseases, are “0” cases recorded and reported?</td><td></td></tr>
<tr><td colspan="3">10. Are the number of cases of notifiable diseases seen at the facility within a specified reporting period same as that reported to the LGA level?

(Randomly select 3 notifiable diseases and verify)</td><td></td></tr>
<tr><td colspan="3">11. Are each of the immediately reportable diseases consistently reported in a timely manner?</td><td></td></tr>
<tr><td colspan="3">Immediately Reportable Diseases</td><td rowspan="2">Notes</td></tr>
<tr><td>Disease</td><td>Yes</td><td>No</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td rowspan="2"></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>List findings seen
For example: Under-reporting or Over-reporting of cases.
Duplicate reporting
Untruthful reporting, (for example, reporting zero, while there is an ongoing outbreak of epidemicprone diseases)
Inconsistent reporting formats (forms).
Late submission/reporting.

Inconsistent reporting periods,</td><td colspan="4"></td></tr>
<tr><td rowspan="2">Thoughts on Report</td><td colspan="4">List possible causes of omissions or problems</td></tr>
<tr><td colspan="4">List recommended solutions, including target date and person responsible</td></tr>
</table>

Annex 2J: Maternal Death-Reporting Form and Perinatal Death Reporting Forms

	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	LGA	
3	Reporting Site	
4	How many of such maternal deaths occurred cumulatively this year at this site?	
5	Date this maternal death occurred (day/month/year)	
6	Maternal death locality (Village or Town)	
7	Record's unique identifier (year-Country code-LGA-site-maternal death rank)	
8	Maternal death place (Community, health facility, LGA 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 deceased pregnant?	
11	Parity: how many times did the deceased 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 labour	
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 baby status at birth? (Alive or Stillborn)	

Annex 2J: Maternal Death-Reporting Form and Perinatal Death Reporting Forms

	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?	
27	(Yes/No/Don't know) 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; Oxytocin; Anti-seizure drugs; Oxygen; Anti-malarial; Other medical treatment; Surgery; Manual removal of placenta; Manual intra uterine aspiration; Curettage, laparotomy, hysterectomy, instrumental delivery (Forceps; Vacuum), Caesarean section, anaesthesia (general, spinal, epidural, local)	
	Definitions	
	Gravida: The number of times the woman was pregnant- Parity**:** Number of times the woman delivered a baby of 22 weeks/500g or more, whether alive or dead	

Annex 2J: Maternal Death-Reporting Form and Perinatal Death Reporting Forms

	Perinatal death – reporting form	
	The form must be completed for selected perinatal deaths, comprising stillbirths and early neonatal deaths	
	Questions / Variables	**Answers**
	Identification	
1	Country	
2	LGA	
3	Reporting site/facility	
4	Perinatal death locality (village or town)	
5	Place of death (community, health facility, LGA hospital, referral hospital or private hospital, on the way to health facility or hospital)	
6	Date this perinatal death occurred (day/month/year)	
7	Record's unique identifier (year-country code-LGA-site) for the mother.	
8	Record's unique identifier (year-country code-LGA-site) for the baby (deceased).	
	Pregnancy progress and care (Perinatal death history and risk factors)	
9	Mother's age (in years)	
10	Type of pregnancy (singleton/twin/higher multiples)	
11	Did the mother of the deceased receive any antenatal care? (Yes/No/Unknown),	
12	If yes to 11, how many visits? _____	
13	Did the mother of the deceased have malaria? (Yes/No/Unknown)	
14	If yes to 13, did the mother receive treatment? (Yes/No/Unknown)	
15	Did the mother of the deceased have pre-eclampsia disease? (Yes/No/Unknown)	
16	If yes to15, did the mother receive any treatment? (Yes/No/Unknown)	
17	Did the mother of the deceased have severe anaemia (HB,7g/dl)? (Yes/No/Unknown)	
18	If yes to 17, did the mother receive any treatment? (Yes/No/Unknown)	
19	Did the mother of the deceased have recommended maternal immunizations (for example, tetanus toxoid) (Yes/ No/Unknown)	
20	Did the mother of the deceased have Rhesus factor (Rh) or ABO incompatibility? (Yes/ No/Unknown)	
21	If Rhesus positive, did the mother of the deceased receive Anti-D injection during this baby's pregnancy? (Yes/ No/Unknown)	

Annex 2J: Maternal Death-Reporting Form and Perinatal Death Reporting Forms

	Perinatal death – reporting form	
22	Did the deceased present an abnormal lie (including breech presentation)? (Yes/ No/Unknown)	
23	What was the HIV status of the mother? (choose "HIV+; HIV-; or Unknown HIV status")	
24	What was the status of the syphilis test of mother? (Positive (+) or negative (-) If she was positive for syphilis, did she receive treatment	
Labour, birth, puerperium		
25	Date of birth (day/month/year)	
26	Attendance at delivery (Nurse/midwife/doctor/other-specify).	
27	Was foetal heart rate assessed on admission? (Yes, No)	
	What type of delivery was it? (choose one from "1=Vaginal non-assisted delivery, 2= vaginal-assisted delivery (Vacuum/forceps), or 3=Caesarean section	
28	Sex of the baby (1=male; 2=female, 3=ambiguous)	
29	Birth weight in grams (>=2500; 1500-2499 (LBW); 1000-1499g (VLBW); <1000 (ELBW))	
30	Did the mother of the deceased have premature rupture of membranes (PROM)? (Yes/No/Unknown)	
31	Did the mother of the deceased have foul smelling liquor?	
32	Gestational age (in weeks) Method of estimation: Ultrasound /LMP (DD/MM/YY)	
33	How long (hours) was the duration of labour?	
Information on the death and actions taken before and after the death		
30	If stillbirth – gestational age (in weeks) of the deceased	
31	If neonatal death – age (in days) of the deceased	
32	If the deceased baby was born alive what was the APGAR Score?	
33	If the deceased baby was born alive, was resuscitation with bag and mask conducted?	
34	If the deceased baby was born alive, was he/she referred to any health facility or hospital? (Yes/No/Unknown)	
35	If the deceased baby was born alive, did he/she receive any other medical care beyond resuscitation? (Yes/No/Unknown)	
	If yes, specify where and the treatment received: * I.V. Fluids; Blood/Plasma transfusion; Antibiotics; Oxygen; Other medical treatment	
	Primary cause of death:	
	Secondary cause of death:	

Annex 2J: Maternal Death-Reporting Form and Perinatal Death Reporting Forms

	Perinatal death – reporting form	
	Maternal condition (if applicable)	
34	Timing of death (1-fresh stillbirth; 2-macerated stillbirth)	
35	Any physical malformation noted on the deceased? (Yes/No)	
	If yes, type of birth defect (with full description):	
	Investigator's report	
36	Analysis and interpretation of the information collected so far (investigator's opinion on this death)	
37	Perinatal death notification date (day/month/year)	
38	Investigator (Title, name and function)	

Stillbirths and Neonatal Deaths Monthly Summary Reporting Form

The form must be completed for stillbirths and neonatal deaths							
Questions/Variables							**Answers**
Identification							
1	Data for the month of						
2	Country						
3	LGA						
4	Reporting site/facility						
5	Births						
		Total Births	Stillbirths			Neonatal deaths	
			Antepartum	Intrapartum	Unknown	Early	Late
	<1000 g (ELBW)						
	1000–1499 g (VLBW)						
	1500–1999 g (LBW)						
	2000–2499 g (MLBW)						
	2500 + g						
	Total						
Pregnancy progress and care (Perinatal death history and risk factors)							
6	Multiple pregnancies						
7	Born before arrival						
8	Mode of delivery						
	Normal vaginal delivery	Vacuum	Forceps	Caesarean	Unknown		
9	Gestational age						
	Term	Post-term	Ext preterm (<1000g)	Very preterm (1000-1499)	Mod preterm (1500-2499)	Unknown	
10	HIV status						
	Negative	Positive	Unknown				
11	Syphilis serology						
	Negative	Positive	Unknown				
12	Maternal age						
	>34 y	20-34	18-19 y	<18 y	Unknown		

2.9 References

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3.0 Analyse Data

It is not enough to only collect, record and report numerical information about illness, death and disability from the catchment area; the data must also be analysed at each level where it is collected. Organising and analysing data is an important function of surveillance. Analysing data provides the information that is used to take relevant, timely and appropriate public health action. Analysis of surveillance data allows for:

(a) Observing trends over time and alerting health staff and relevant stakeholders about emergent events or unusual patterns
(b) Identifying geographical areas at higher risk
(c) Characterising personal variables such as age, gender or occupation that place a person at higher risk for the disease or event
(d) Monitoring and evaluation of public health interventions
(e) Guide public health policy and planning

In general, analysing routine surveillance data should address the following questions:

(a) Have any priority diseases or other public health events of concern been detected during the reporting period (this week, for example)? Is an outbreak or unusual public health event suspected?
(b) Of the cases, deaths or events detected, how many were confirmed?
(c) Where did they occur?
(d) How does the observed situation compare to previous observation time periods this year or the previous year? For example, when compared to the start of the reporting period, is the problem increasing?
(e) Are the disease trends stable, improving or worsening?
(f) Is the reported surveillance information representative enough of the reporting facility/site catchment area? Out of all the facility/site that should report, what proportion has actually reported?
(g) How timely were the data received from the reporting facilities/sites?
(h) What period (seasonality) is it occurring?
(i) Who is affected? Which occupational groups are most at risk?

Each reporting facility/site that collects or receives data should prepare and follow an analysis plan for analysing routine surveillance information (refer to Annex 3A).
This chapter describes how to receive surveillance data and analyse 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 summarising the findings are also included. Information in this chapter can be applied at the national, State, LGA and health facility levels.

3.1 Receive, Handle and Store Data from Reporting Sites

The routine flow of surveillance data is usually from reporting facilities/sites to the next level, up to the national level. A reporting facility/site is a facility/site which reports about surveillance and outbreak data to the next level. This includes all health facilities (public, private and quasi-governmental, faith-based), standalone laboratories, and PoE. A reporting facility/site also reports events from community surveillance and response.

At the health facility level, both inpatient and outpatient services are reporting facility/site. The information collected from the facility/site is compiled in standard forms (immediate/case-based form, Weekly and Monthly IDSR Summary Reporting Forms, Case Investigation forms, Line listing forms, etc.), analysed and then forwarded to the LGA health management team. In areas where there is already an electronic system (SORMAS, mSERS, DHIS 2.0), data is entered using a mobile device or a computer, and the LGA health management team can access compiled information from a computer (Refer to Chapter 9 on eIDSR, SORMAS, mSERS, DHIS 2.0 for details).

At LGA level, data from the communities are collected and collated by the ward focal person who in turn forwards to health facilities in its catchment area and to the LGA. The LGA DSNO collates, aggregates and sends the data and reports to the state and subsequently to the national level.

Adequate data protection and security must be ensured. Care must be taken not to leave documents containing personal health information related to notifiable conditions on work desks or anywhere they may be accessible to unauthorized persons. Hard copies of identified notifiable conditions should be stored in locked cabinets in a secure location. Data which is stored in a computer should be password protected with appropriate restricted access. Network hardware and any back up or copies of notifiable conditions data must be password protected and stored in a secure location.

3.1.1 Receive Data

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

(a) Acknowledge receipt of the data/report.

(b) Log into an appropriate logbook any data set or surveillance report received from any reporting facility/site (Refer to Annex 2G).

(c) Record in the log the date the data was received, what is the report about and who is the sender.

(d) Verify whether the data set arrived on time or was late.

(e) Check the completeness of the data set or reports, that is, the number of data sets/reports as against the number of expected data sets or reports

(f) Review the data quality:

  (i) Verify whether the form (hard copy or electronic file) is filled out accurately.

  (ii) Ensure that the form is filled completely (for example, no blanks).

(g) Check to be sure there are no discrepancies on the form. Verify from the reporting facility/site (by phone, e-mail or text message) and correct any discrepancies.

(h) Merge the data and store them in a database.

(i) For electronic surveillance refer to the section 9 on eIDSR and other electronic sources.

3.1.2 Enter and Clean the Data

At each level where data is received (health facility, LGA, states or national), the surveillance team should always liaise with the Health Information System focal person to extract the priority IDSR diseases from the register and enter correctly into aggregated IDSR reporting forms while listing data from all the reporting facilities/sites. Troubleshooting and cleaning data prior to analysis is an important data management practice. Disease trends and maps will not be accurate if information about number of cases, time of onset, or geographical location of cases are missing. Use opportunities during supervisory visits to sensitise clinicians and laboratory staff about the importance of quality practices for recording patient information in patient logbooks/register or reporting forms. Emphasise that patient logs are sources of data for reporting public health information and play a role in detecting an unusual event or otherwise undetected public health problems.

Ensure that health facility personnel know the algorithm for reporting including reporting levels. Also ensure that there are recording logbooks, including rumour logbooks. The registers which are normally used in the health facilities are the OPD and IPD registers, and the surveillance focal persons should always liaise with the health information focal person, to extract the priority disease of IDSR from the registers.

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

(a) Update aggregate totals for each week or month that data was received.

(b) Record a zero when no case is reported. If a space which should have been filled-in is left blank/dash/not applicable, 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 allows the next level to know that surveillance did not detect a case of the particular disease or condition.

(c) Ensure that weekly totals include only those cases or deaths actually reported for that epidemiological week (Monday to Sunday). Late reports from previous weeks should be entered in the relevant week and totals updated accordingly.

(d) Avoid duplicate entries by using the report or case record unique identifier to prevent, and also check for, multiple entries of the same records.

(e) Establish frequent contacts with the reporting facilities/sites in order to clarify issues of missing information/errors and address inconsistencies detected in the reporting.

(f) Ensure consistency and harmonization of data.

(g) Ensure that update of information on laboratory results is done by linking to the respective case record unique identifier.

Once the data has been received and entered into the aggregate forms, review it carefully to ensure that no mistakes were made during entry. Since surveillance data informs decisions about disease control and prevention actions, there are important ethical, social and economic consequences if data is not entered and managed correctly or on time. During an outbreak, ensure that data is collected using a line list.

3.2 Analyse Data by Time, Place and Person

Findings from data analysis may trigger investigations and subsequent response to an outbreak, condition, or public health event. Data should be analysed by time, place and person (see Table 3.1).

Type of analysis	Objective	Method	Data Display Tools
Time	Detect abrupt or long-term changes in disease or unusual event occurrence, how many occurred, the seasonality and the period of time from exposure to onset of symptoms.	Compare the number of case reports received for the current period with the number received in a previous period (days, weeks, months, quarters, seasons or years).	Record summary totals in a **table** or on a **line graph** or **histogram (Epi-curve) or sequential maps[1].**
Place	Identify where cases are occurring (for example, to identify high-risk area or locations of populations at risk for the disease).	Plot cases on a map and look for clusters or relationships between the location of the cases and the health event being investigated. (for example, cases near a river, cases near a market)	Plot cases on a spot map of the LGA or area affected during an outbreak. Dot density analysis can also be used to depict the number of cases by geographical location. **NB:** The information can also be presented in a table or a bar chart, but plotting cases in a map will assist in quick assessment and allow prompt intervention.
Person	Describe reasons for changes in disease occurrence, how it occurred, who is at greatest risk for the disease, and potential risk factors.	Depending on the disease, characterize cases according to the data reported for case-based surveillance such as age, sex, place of work, immunization status, school attendance, and other known risk factors for the diseases.	Extract specific data about the population affected and summarise in a **table or a bar chart or a pie chart**

Table 3.1: Types of analysis, objectives, data display tools and methods

3.2.1 Analyse Data by Time

Data from this type of analysis 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.

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

Graphs are made with lines (a trend line) or bars (a bar graph or histogram) to measure the number of cases over time. How to make a graph is described in Annex 3B of this chapter.

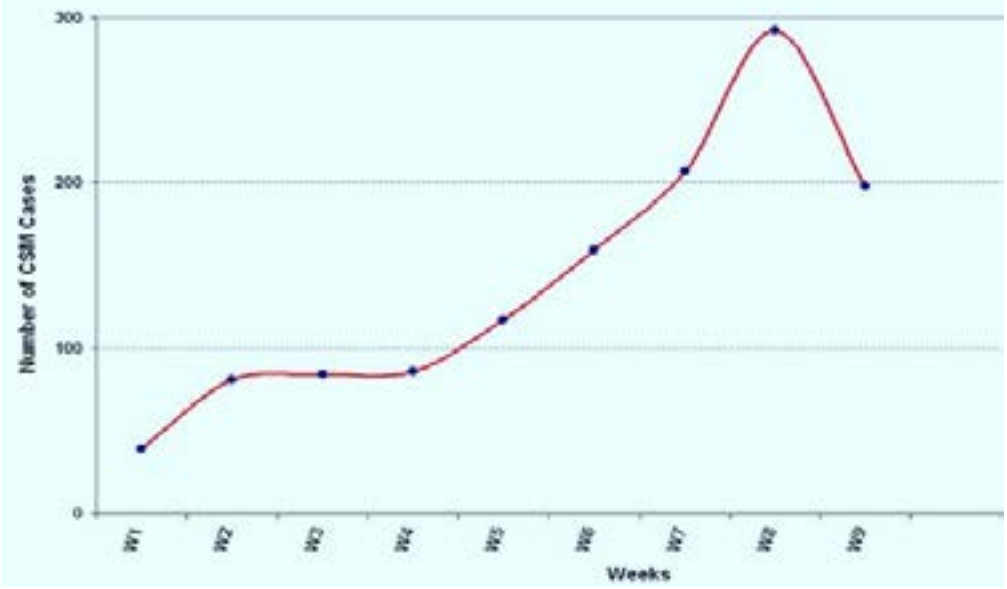


Figure 3.1: Example of line graph: Weekly trend of reported Cerebrospinal Meningitis cases, Gondwana LGA, Epidemiological weeks 1-9, 2017

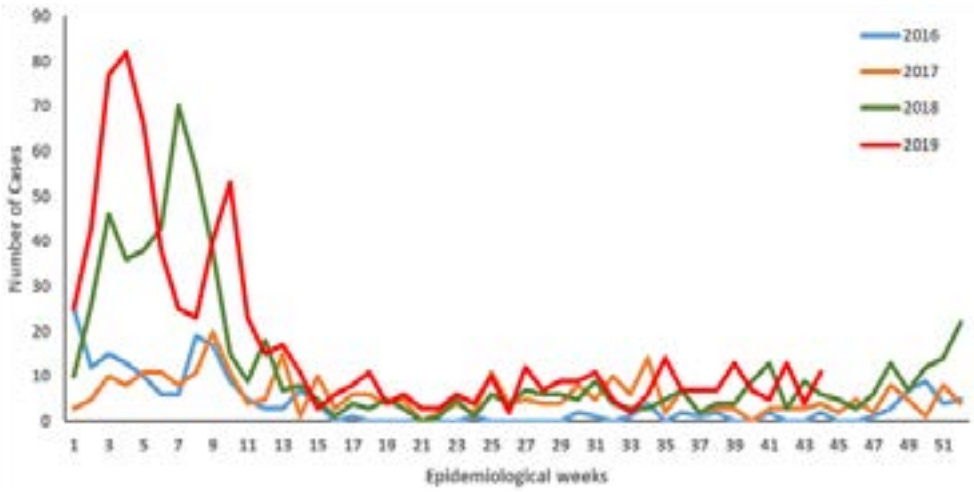


Figure 3.2: Lassa fever Trend line by week in Nigeria

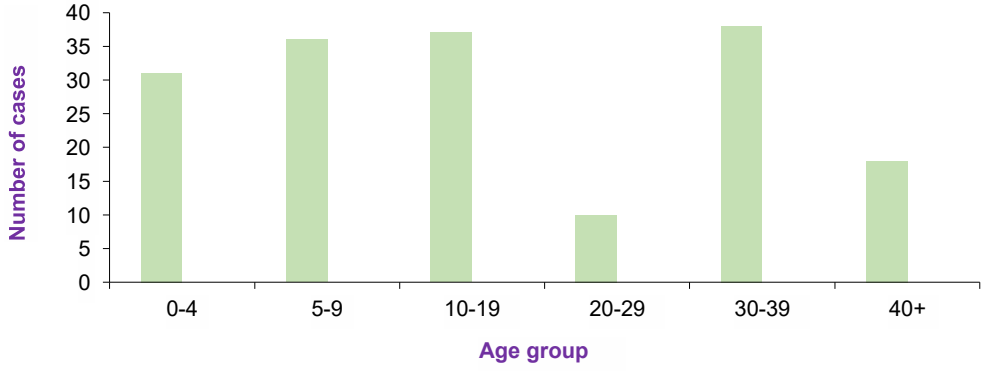


Figure 3.3 Example of a bar graph: Example: Age distribution of Diarrhoeal cases during an outbreak in Gondwana LGA, 2004

Using a Histogram

Prepare a histogram (epidemic curve) using data from the case reporting forms and line lists. Plot cases on the histogram according to the date of onset. The title of the graph should include the name of the geographical location being described and reporting period.

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

(a) Onset of the first (or index) case occurred

(b) The health facility notified the LGA

(c) The first case was seen at the health facility

(d) The LGA began the case investigation

(e) The laboratory confirmed the outbreak

(f) A response was initiated

(g) The LGA notified the state level and the state notified the national level

The results of this analysis allow users of this information to look back at the outbreak and answer questions such as when patients were exposed to the illness, the length of the incubation period, type of the source, duration between detection and confirmation of the outbreak and transmission pattern of the illness and likely time of exposure to the causative agent.

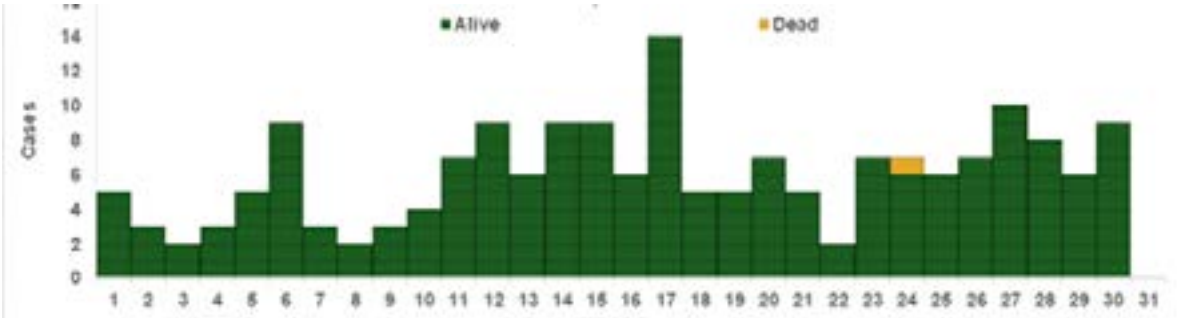


Figure 3.4 Example of histogram (epidemic curve): Reported Cholera cases, Gondwana LGA, Epidemiologic week 1–30, 2019

Figure 3.5: Example of Disease Trend: Yellow fever cases in Nigeria 2017 -

3.2.2 Analyse Data by Place

Analysing data by place provides insight 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. The dot density will give the total number of cases per defined geographical area.

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

(a) Clusters of cases occurring in a particular area.

(b) Travel patterns that relate to the method of transmission for the disease.

(c) Common sources of infection for these cases.

Use manual methods or open source Geographic Information System (GIS) software, such as Health Mapper, QGIS, or GIS to create maps to use as part of routine analysis of disease surveillance of data. On a map of the area where cases occurred, mark the following:

(a) 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 or other locations as appropriate to the disease or condition being investigated. See chapter 11, for disease-specific guidelines.

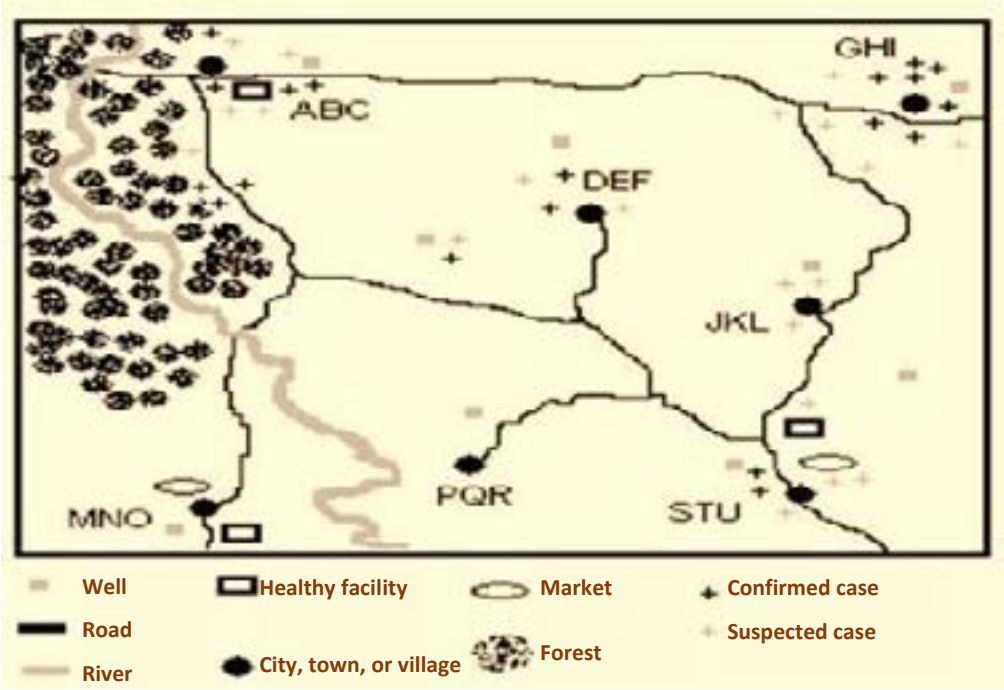


Figure 3.6: Example of LGA spot map showing location of suspected and confirmed cases

Figure 3.7 Example of a spot map using a GIS software showing concentration of cases along particular areas

3.2.3 Analyse Data by Person

Analysis by person describes the population with the condition as well as those at risk of contracting the condition or being exposed to factors associated with it. These factors may reveal important clues to understanding the disease, why it occurred and how to control it, thus preventing further spread. 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:

(a) Age group

(b) Sex

(c) Occupation

(d) Urban and rural residences

(e) Vaccination status

(f) Risk factors

(g) Outcomes

(h) Final classification

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

Analysis by person is usually recommended for describing the population at risk. This analysis is easiest when the data is 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 LGA. Simple percentages and rates are useful for comparing information reported to the LGA. The first step in analysing data by person is to identify the numerator and denominator for calculating percentages and rates.

(a) 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 measles that occurred during the year in school-aged children).

(b) The denominator is the number of people in 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 measles cases this year in school-aged children
A	42
B	30

By looking only at the number of reported cases, it appears that a higher occurrence of measles 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 incidence (that is, number of new cases) of measles cases during the last 12 months in school-aged children, the LGA DSNO can compare the impact of the illness on each facility. The numerator is the number of new cases that occurred over one year. The denominator is the number of school-aged children at risk in each catchment area. The measure obtained is called incidence rate or attack rate. In this example, the incidence rate is higher in health facility B than in health facility A.

Health facility	Incidence of measles per 100 school-aged children during last 12 months
A	4%
B	5%

3.2.4 Make a Table for Analysis by Person

For each priority disease or condition under surveillance, use a table to analyse characteristics of the patients who are becoming ill. A table is a set of data organised 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:

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

(b) 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.

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

(d) 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 measles cases per year	Number of deaths per year
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:

(a) 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 - 4 years of age).

(b) Calculate the total number of cases for the time or characteristic being measured. (In this example, there are 78 cases reported).

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

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

Age group	Number of reported cases	Percentage 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 the Attack Rates

The attack rate is the measure of frequency of morbidity, or speed of spread, in an at-risk population. An attack rate describes the risk of getting the disease during a specified period, such as the duration of an outbreak. Attack rate is defined as the frequency with which an event (such as a new case of illness) occurs in a population at risk over a specified period, and is usually calculated in an outbreak scenario. It is expressed per population at risk; for example: 4.5/100 000 population.

$$\frac{\text{Number of new cases during specified period}}{\text{Size of population at risk at start of that period}} \times \text{constant (such as 100\% or 1000)}$$

Example:

16 cases of cholera in village with a population of 800.

Attack rate =16/800 =0.02

0.02 x 100 = 2.0, that is, 2 cases per 100 population = 2.0%

During an outbreak, this 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.

3.2.7 Calculate a Case-fatality Rate

A case-fatality rate helps to:

(a) Know the proportion of deaths among cases.

(b) Indicate whether a case is identified and managed promptly.

(c) Indicate any problems with case management once the disease has been diagnosed.

(d) Identify a more virulent, new or drug-resistant pathogen.

(e) Indicate poor quality of care or no medical care.

(f) Compare the quality of case management between different catchment areas, cities, and LGAs.

(g) Assess health seeking behaviours.

(h) Identify underlying conditions to severe diseases, for example, immune deficiency.

Public health programmes can impact the case-fatality rate by ensuring that cases are promptly detected and effective case management takes place. Disease control recommendations for some 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).
3. Multiply the answer by 100 (0.06 X 100 equals 6%).

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

See the disease-specific guidelines in chapter 11 for recommendations about the essential variables to compare for each disease.

3.3 Compare Analysis Results With Thresholds for Public Health Action

Thresholds are markers that indicate unusual situation and require that something should happen or change. They help surveillance and programme managers answer the question, "When should I take action, and what will that action be?" Information on establishing thresholds is in chapter 4 of this guideline.

In IDSR, there are two types of thresholds used to initiate response: alert and epidemic thresholds. These thresholds are normally expressed in terms of the number (or proportion) of cases of a disease and the critical point (threshold) beyond which action must be taken. Trained health-care personnel should always determine the alert and epidemic thresholds for epidemic-prone diseases, conditions or events.

Refer to chapter 11 for disease-specific information including surveillance case definitions, alert and epidemic thresholds for reporting suspected cases or events.

Thresholds are based on information from two different sources:

(a) In some instances, there might already be a situation analysis which has been done to describe the risks for occurrence of a particular disease, and who the people at risk might be and there is already a described action that needs to be done once the risks have been identified to prevent a wider outbreak.

(b) International recommendations from technical and disease control programme experts.

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

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

Epidemic threshold triggers a definite response. It marks the specific data or investigation finding that alerts an action beyond confirming or clarifying the problem. Possible actions include communicating laboratory confirmation to affected health facilities, implementing an emergency response such as an immunisation activity, community awareness campaign, or improved infection control practices in the health care setting. Several thresholds have been proposed for action based on disease surveillance findings. For rare diseases or diseases targeted for elimination, detection of a single case suggests an epidemic (e.g. Yellow fever). In such situations, one case is unusual and is a serious event. This is because these rare or targeted diseases have the potential for rapid transmission or high case-fatality rates.

In other situations, a number of cases will trigger a response. For example, In Nigeria and other countries in the meningitis belt the epidemic threshold for bacterial meningitis is 10 suspected cases per 30,000 – 100,000 population per week and in population less than 30,000 is five suspected cases in one week or doubling of the number of cases in a three-week period (minimum of two cases in one week). The alert threshold is three suspected cases per 30,000 – 100,000 population per week and in population less than 30,000 is two suspected cases per week or an increased incidence compared to previous non-epidemic years (refer to chapter 11 for disease specific guideline).

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

Suggested thresholds for taking action in specific diseases or conditions are discussed under chapter 11

3.4 Draw Conclusions from the Findings to Generate Information

The following should be considered when drawing conclusions from findings:

(a) Routinely (weekly or monthly) gather or present the graphs, maps and tables and meet with the LGA health team or relevant stakeholders to review analysis, results and discuss the findings.

(b) Systematically review the findings following the LGA's analysis plan (see Annex 3A) if one has been prepared

(c) Make sure you also correlate the analysis you have done with other data sources, like from animals (domestic or wildlife), or the environment to assist in correct interpretation of your findings. For example, if you have seen a number of human rabies cases, it will be important to get information from the animal sector on the status of any current dog bite investigations, quarantined animals, or dogs vaccinated.

(d) Consider quality of the data when interpreting results. For example:

  (i) Missing data values (completeness per month, per event).

  (ii) Inconsistencies (between linked data elements — validation).

  (iii) Arithmetic errors (in correlation and aggregation).

  (iv) Obvious fluctuations (sharp increase or decrease per month, per event).

It is important in a system where eIDSR has been established to ensure that there are features to improve data quality and these might include:

(a) Data input validation
(b) Maximum and Minimum values
(c) Validation rules

At a minimum, review the findings to:

- Assess whether the situation is improving or not
- Make a comparison of the observed data to the expected data
- Consider possible explanations for an apparent increase in cases

- Has there been a change in the number of health facilities reporting information?
- Has there been a change in reporting procedures or surveillance system?
- 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 programmes, or 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 an increase in refugee populations?
- Has there been any change in the quality of services being offered at the facility (for example, lines are shorter, health staff are more helpful, drugs are available, clinic fees are charged)?
- Is there an increase or improvement in laboratory testing/diagnostic procedure (e.g. increase turnaround time - TAT)?
- Is there an increased awareness of disease in the public? For example, mass vaccination campaign and awareness of a particular disease will lead to an increase of cases presented to the facility
- Are there backlog of cases being reported which were supposed to be reported earlier?
- Are there new settlements affected?

3.5 Summarise and Use the Analysis to Improve Public Health Action

Prepare and share with all stakeholders including affected communities who need this information, a concise action-oriented summary reports 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 surveillance data analysis results. Use them to take action to:

(a) Conduct an investigation to find out why there is an increase/decrease in the number of cases.

(b) Collaborate with specific disease reduction programmes to intensify surveillance if an alert threshold has been crossed.

(c) Provide feedback to the health facility where the cases were detected.

(d) Carry out advocacy with political leaders and the community for more resources if a lack of resources is identified as a cause for the increased number of cases.

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 analysis, results and provide feedback on time. (Refer to chapters 7 and 8).

3.6 Annexes to Chapter 3

Annex 3A Make a plan for routine analysis of surveillance information
Annex 3B How to manually make a line graph

Annex 3A: Make a Plan for Routine Analysis of Surveillance Information

A minimum plan for routine analysis of surveillance information should include the following information which could be presented as tables, graphs and maps.

1. Calculate completeness and timeliness of reporting. Monitoring whether surveillance reports are received on time and if all reporting facilities/sites have reported. This is an essential first step in the routine analysis of the surveillance system. This assists the LGA (or other levels) surveillance team in identifying silent areas (areas where health events may be occurring, but which are not being reported) or reporting facility/sites that need assistance in transmitting their reports. It also depicts how representative the data is for the specific level.
2. Calculate LGA (or other levels) 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 geographical variables (such as hospitals, residence, reporting facility/site, neighbourhoods, village and so on) to analyse the distribution of cases by place. This is the information that will help to identify high-risk areas.
5. Analyse 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 increase or disease patterns.
6. Data validation and quality analysis. Establish a data validation team at all levels. Meetings should be held periodically to review reports. All reports submitted must be checked for consistency with various sources.

An example of a product from an analysis plan for routine surveillance information can be seen in the following page:

Example of data analysed for Cholera in State A, 2019				
	Distribution case-fatality rate by Time			
Onset week	Total	Outcome		Case-fatality rate
		Alive	Deaths	
26	**23**	16	7	30
27	**97**	92	5	5
28	**88**	87	1	1
29	**21**	19	2	10
32	**11**	11	0	0
33	**11**	9	2	18
Total	**251**	234	17	7
Distribution of case-fatality rate and attack rate by Place				
LGA	Total	Outcome		Case-fatality rate
		Alive	Deaths	
LGA 1	**1**	1	0	0
LGA 2	**92**	86	6	7
LGA 3	**158**	147	11	7
Total	**251**	234	17	7
LGA		Population	Cases	Attack rate per 100 000
LGA 1		179888	92	**51**
LGA 2		78524	158	**201**
Distribution case-fatality rate by Person				
Age Group	Total	Outcome		Case-fatality rate
		Alive	Deaths	
0-4	**37**	35	2	5
5-9	**55**	50	5	9
10-14	**30**	28	2	7
15-19	**23**	23	0	0
20-24	**28**	27	1	4
25-29	**26**	24	2	8
30-34	**12**	11	1	8
5-39	**8**	6	2	25
40 +	**32**	30	2	6
Total	**251**	234	17	7
Sex	Total	Outcome		Case-fatality rate
		Alive	Deaths	
Female	**122**	114	8	7
Male3	**129**	120	9	7
Total	**251**	234	17	7

Annex 3B: How to Manually Make a Line Graph

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 colour. 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.

4.0 Investigate and Confirm Suspected Outbreaks and Other Public Health Events

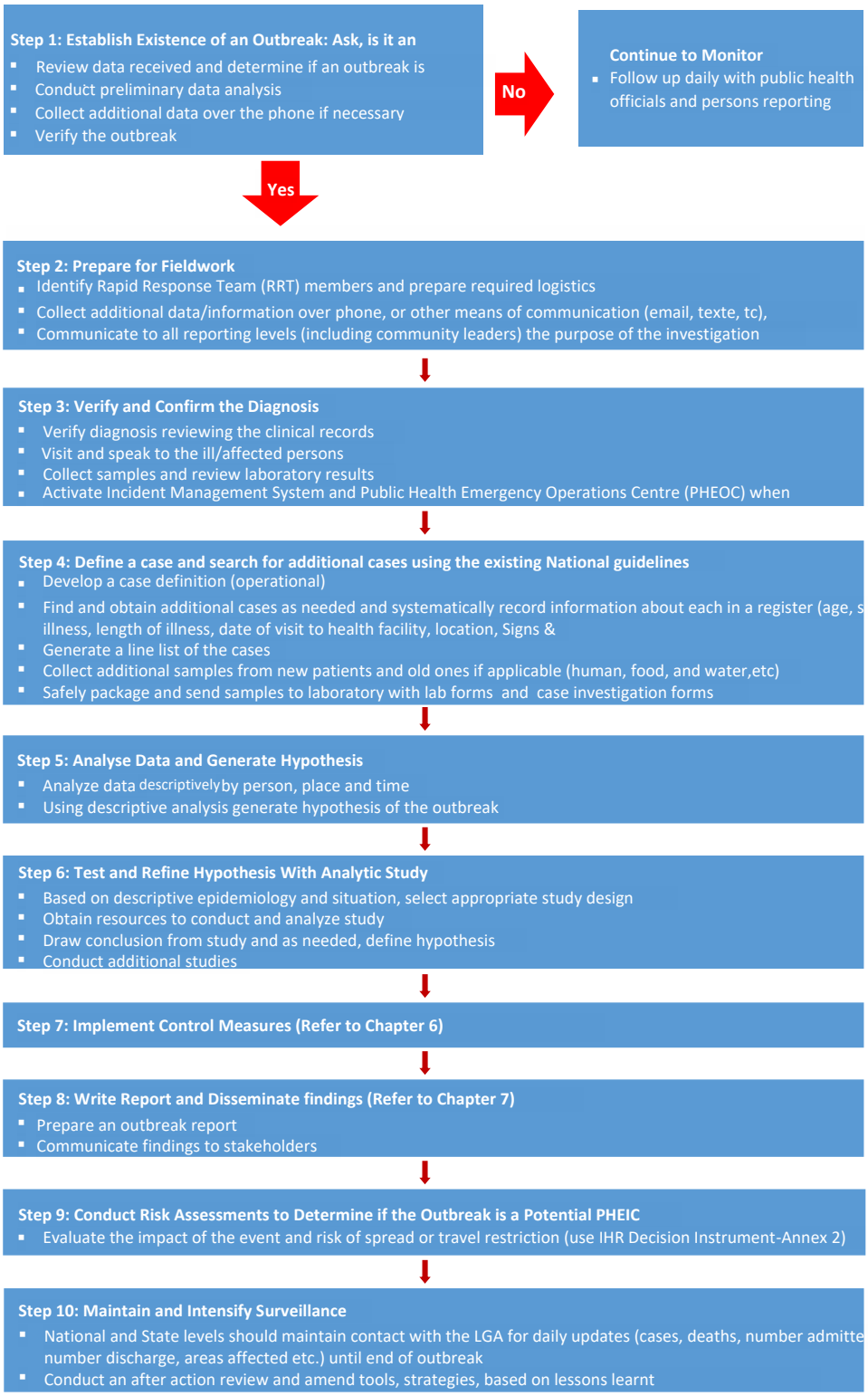
This chapter presents the steps that should be taken when conducting an outbreak investigation. An outbreak is defined as an increase in the number of cases of a disease or an event above what is normally expected within the population in a given area over a particular time period. When an outbreak or any public health event or condition is detected and notified, several steps need to be followed when conducting outbreak investigation (see Figure 4.1). Although these steps are usually listed in order, their implementation is often non-sequential. Knowledge of these steps is crucial to proper investigation of the outbreak, using common sense and logic to determine when, how often and to what extent the different steps should be implemented in a real investigation. These steps can also be followed to investigate other public health problems in the LGA such as a detected increase in chronic or non-communicable diseases.

The results of an investigation targeting an outbreak or other public health event leads to identification and assessment of persons exposed to an infectious disease or affected by an unusual health event. The investigation provides relevant information needed to take immediate action and improve longer-term disease prevention activities.

The purpose of an investigation is to:

(a) verify the outbreak or the public health event and risk
(b) identify and treat additional cases that have not been reported or recognized
(c) collect information and laboratory specimens for confirming the diagnosis
(d) identify the source of infection or cause of the outbreak
(e) describe the epidemiological situation in time, place and person
(f) describe how the disease is transmitted and the populations at risk
(g) select appropriate response activities to control the outbreak or the public health event
(h) strengthen prevention activities to avoid future reoccurrence of the outbreak.

Figure 4.1: Steps in outbreak investigation



I. Decide to Investigate a Reported Outbreak or Public Health Event

An entity's responsibility and capacity to investigate an outbreak depends on national policy, and availability of resources. In Nigeria, LGAs have the responsibility for investigating outbreaks, in collaboration with health facilities, State and National level.

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 because these are dangerous diseases with the potential for rapid transmission or high case fatality rates if they are not treated promptly.

The trigger for other diseases is when cases reach a defined threshold (e.g. a particular number of cases per 100,000 population) within a given community, geographical area or season. Sometimes a single case of a communicable disease long absent from a population, or caused by an agent (e.g. bacterium or virus) not previously recognized in that community or area, or the emergence of a previously unknown disease or event, may also constitute an outbreak which should be reported and investigated.

Health personnel should promptly investigate the problem and respond to immediate cases. Preparations for taking a wider public health response should also be made. Alert and epidemic thresholds are also described in chapter 11 in detail.

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

Some urgent health events require the immediate commencement of investigations. Regardless, LGAs should aim to investigate suspected outbreaks and events immediately or not later than 48 hours of notification from the lower level.

Conduct an investigation when:

(a) The LGA receives a report on the suspected outbreak of a disease targeted for immediate notification

(b) An unusual increase in the number of cases or deaths is noted during routine data analysis

(c) Alert or epidemic thresholds have been reached for specific priority diseases; the initial trigger for a new epidemic-prone disease could be the laboratory

(d) Communities or social media report signals of deaths or a large number of cases that are not brought to the health facility

(e) A cluster of illnesses or deaths occurs for an inexplicable or unusual reason (e.g., adult death due to bloody diarrhoea, a cluster of illness among health care workers, a cluster of (domestic and/or wild) animal deaths; e.g. widespread death of birds due to avian influenza, livestock deaths due to anthrax, unusual abortion events in livestock).

II. Verify the Reported Information

Outbreak investigation requires human, logistic and financial resources. When a suspected outbreak or event is reported, promptly verify that the information is accurate and reflects conditions that suggest 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 (e.g. is the source of the signal reliable? Is the report coming from a health facility, community, traditional or social media?).
- Severity of the reported illness and use of standard case definition for reporting
- Number of reported cases and deaths
- Age and gender disaggregation of reported cases or deaths
- Mode of transmission of suspected pathogen and risk of wider transmission
- Political or geographical considerations
- Importance of maintaining good partnership and community relations
- Available resources
- Determine whether it is an event of national or international concern

Considering the above factors could reveal that the situation requires a more urgent response than expected. For example, reports on a suspected case of Viral Haemorrhagic Fever (VHF) are treated with greater urgency than reports of a less virulent disease because of the potential for high case fatality rates and rapid transmission.

Regardless of the factors, all suspected outbreaks or events (including immediately notifiable diseases or events) reported from health facilities need to be reported to the next level within 24 – 48hours

III. Record Reported Outbreaks, Public Health Events and Signals

Prepare a method for tracking the reporting of suspected outbreaks, events and signals to the LGA. The purpose of tracking reported outbreaks is to ensure that the report of each suspected outbreak or signal is followed by some action and resolution. Keeping such a record is necessary to collect the information needed to evaluate the timeliness and completeness of the outbreak investigation and response.

A sample form for tracking reports of outbreaks and signal is found in Annex 4A of this section. If the LGA is using an LGA analysis workbook for recording and analysing long-term trends, it should include the tracking form in the LGA signal logbook.

Where feasible, outbreak alerts should be recorded and managed using electronic event management systems (see chapter 9).

4.1 Prepare to Conduct an Investigation

4.1.1 Mobilise Public Health Emergency Rapid Response Team (PHERRT)

Before embarking on an outbreak investigation, take the necessary preparatory measures. These include providing the team with appropriate information and data on the suspected disease so that everyone knows what to look for and what precautions to take. If the disease is known, the team needs to pay particular attention to signs and symptoms, case definitions, modes of transmission, diagnostic tests, control measures, etc.

Mobilise the LGA Public Health Emergency Rapid Response Team (PHERRT) and make arrangements for investigating the report. The PHERRT is a technical, multidisciplinary team that is available for quick mobilisation and deployment to support the field response to a suspected or confirmed outbreak or event. Include the LGA Primary Health Care Coordinator/

Medical Officers of Health and any other relevant personnel who have already been identified and trained to be part of the rapid response team in the investigation planning.

Periodically review and update the immunization status and medical screening records of personnel who take part in infectious diseases outbreak investigation and response activities

It is advisable to have a database of trained public health workers who can rapidly be mobilised to perform the following functions:

(a) Coordination
(b) Surveillance
(c) Laboratory confirmation
(d) Clinical case management
(e) Infection Prevention and Control (IPC)
(f) Environmental health and sanitation
(g) Water, sanitation and hygiene (WASH)
(h) Social mobilisation and risk communication
(i) Animal health
(j) Logistics
(k) Vaccination

In resource constrained settings, experts who can perform more than one function may be co-opted into the PHERRT.

The composition of the PHERRT should include at least the following:

(a) Coordinator / team lead
(b) Clinician – to oversee case management
(c) Infection Prevention and Control (IPC) officer
(d) Public health nurse
(d) Surveillance officer
(e) Epidemiologist
(f) Data manager

(g) Medical Laboratory Scientist
(h) Environmental health officer/scientist
(i) Veterinary/livestock officer/wildlife officer
(j) Social mobilisation and risk communication officer
(k) Psychosocial support (PSS) officer
(l) Logistics officer
(m) Others based on the specific characteristics of the outbreak (e.g. immunisation officer in case of vaccine preventable diseases, water sector expert in the case of a cholera outbreak, an expert in chemicals or radio-nuclear sciences or even the Food and Drugs Authority in case of suspected poisoning from mines etc.).

Chapter 5 describes in detail the composition of other teams when responding to an outbreak and other public health events.

The terms of reference that define the objectives of the investigation should be developed for the team, so that the essential information will be gathered for investigating the outbreak and implementing the most appropriate and relevant response. Identify the relevant stakeholders or partners involved. The national and sub-national levels may deploy personnel to support the LGA in the investigation and response to outbreaks/public health emergencies as per the national policy.

PHERRT should have access to standard guidelines and standard operating procedures/methods/tools that are relevant to the disease or condition being investigated (e.g. SOPs for collecting the correct laboratory specimen, case management guidelines, case investigation forms, line-listing forms).

4.1.2 Specify the Respective Tasks and Expected Roles of PHERRT Members

Inform the team about the tasks they are expected to carry out during the investigation and the functions they will support. Specify tentative timelines for the work. Contribute to the positive motivation for conducting 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 all health and non-health personnel in the team have access to and know how to use the required personal protection equipment (PPE) and the universal precautions that should be taken to forestall the possible cause of the suspected outbreak or event.

4.1.3 Define Supervision and Communication Lines

Make a plan for how the teams will communicate during an investigation. 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 most local level. For example, define who will communicate with the Ministry of Health, the media and the community. State the methods for communicating and how often it should be done during an outbreak to keep relevant stakeholders informed. Methods may include daily updates by mobile phone, electronic mail or conference calls. Show on the diagram the lines of authority and the roles of each team member. Define the role of non-health workers and how they should be supervised.

It is essential to institute a procedure for communicating 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.

4.1.4 Decide on the Area Where the Investigation Will Take Place

Review information already known about the suspected illness, including its mode of transmission and risk factors. Use this information to define the geographical boundaries and target population of the investigation. Begin the investigation in the most affected place.

Contact nearby health facilities to determine whether they have received similar case(s) or recorded an increase in cases with the same diagnosis. Involve the community and local health facility staff in the planning and conduct of the investigation. Listen to and seek out information about local customs, culture and routines that could affect the success of the outbreak investigation.

4.1.5 Obtain the Required Authorisations

Observe the appropriate authorizations, clearances, ethical norms and permissions that are required to do the investigation. In addition to official authorisations, include agreements with local persons of influence in the community.

4.1.6 Finalise Forms and Methods for Collecting Information and Specimens

Select those variables needed to identify, record and analyse the disease being investigated (A selection of case investigation forms with key variables noted can be found in Annex 4E).

Depending on the responsibilities of team members, review how to:

(a) record case information on a line list for later use in summarising variables for use in time, place and person analysis

(b) fill the appropriate request forms, label laboratory samples properly and use a unique ID number for a given case

(c) prepare and update an epidemic curve

(d) construct a spot map showing the location of geographical variables such as location of cases and deaths

(e) develop analysis tables for risk factors, age group, sex, immunisation status etc.

4.1.7 Arrange Transportation and Other Logistics

Make travel arrangements for getting to and from the site of the investigation and for travelling during the investigation. Ensure that transport arrangements for moving specimens to the appropriate laboratories have been made prior to the team's departure. Other logistics such as medical supplies, vaccines and PPEs should also be available.

4.1.8 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 and talk to state laboratory focal person/state epidemiologist to find out the requirements for laboratory supplies needed for the proper collection, handling, storage, and transport of relevant specimens (See Annex 4B).

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

Refer to the disease-specific guidelines in Chapter 11for laboratory requirements.

4.2 Verify and Confirm the Outbreak or Event

4.2.1 Review the Clinical History and Epidemiology

Examine the patient or patient's records to confirm that their signs and symptoms meet the case definition. (Do not forget to use the minimum PPE.) Ask the patient or a family member who can speak for the patient, the following questions:

(a) where do you live?

(b) when did the symptoms begin?

(c) who else is sick in your home, school, workplace, village, neighbourhood?

(d) where have you travelled to recently?

(e) where have you been living recently prior to the onset of symptoms (residence at time of infection)?

(f) were you visited by anyone recently?

(g) who took care of you when you started feeling sick?

(h) have you been in contact with sick or dead animals (both domestic and wildlife)

(i) have you been in contact with any sick or dead person?

(j) has anybody died in the community you live recently?

(k) did you participate in the burial ceremony? (What role did you play?)

(l) for suspected Adverse Event following Immunization (AEFIs), what vaccines have you received recently?

4.2.2 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 chapter 11 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. See Annex 4H for how to pack samples using a triple package technique. Note that some diseases may require additional food or environmental samples to aid in diagnosis and ensure that these samples are also collected; e.g. water samples for cholera outbreaks and food samples for foodborne outbreaks.

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.

4.3 Define and Search for Additional Cases

4.3.1 Define a Case

After establishing that an outbreak is occurring, and verifying the correct diagnosis, a crucial step is to define what constitutes a case in this investigation. In chapter 11, a list of standard case definitions for most IDSR priority diseases is already available. Even in situations where a case definition might be available, specific outbreaks may require the inclusion of other details in the case definitions such as: geographical location, attendance at an event or travel to a certain location. In some circumstances, you might encounter a new disease not listed in chapter 11 and you will then have to develop an operational case definition. The common elements of a case definition include information on symptoms, date of onset of symptoms, laboratory results and the essential elements of person, place and time.

4.3.2 Isolate and Treat Cases as Necessary

Use the case definition to isolate cases. Isolation is a critical step in limiting the spread of the disease and keeping health care facilities open and health care workers available. Depending on the suspected disease, immediate isolation may be required to protect staff, patients and community members. Ensure the cases in isolation units have access to facilities like water and toilets. As indicated by the case management guidelines, strengthen infection prevention and 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 and in the community especially, during an outbreak of a disease transmitted by contact with contaminated supplies and body fluids.

4.3.2 Search for Additional Cases

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

I. 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 and in those through which the person may have passed through during travel. See Annex 4D at the end of this section for instructions on how to conduct a register review. Make sure to follow up any case(s) that have been allowed to go home.

II. Search for contact persons and suspected deaths in the community
   Identify all areas of likely risk where the patients have lived, worked or travelled like parties, family outside the country, visiting zoo, poultry farm, laboratory, hunting sites, exposure to contaminated water, etc. Also talk to other informants in the community such as chemical sellers, patent medicine vendors, school teachers, veterinarians (to know about the animal health situation), farmers, religious and community leaders, etc.

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. 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. Find out if there have been any recent deaths. If such recent deaths have occurred, find out the signs and symptoms experienced by the person(s) who died. Enquire about the persons who took care of these people when they were sick and about preparation of the dead before and during the burial ceremony. Collect information that will help to describe the magnitude and geographical scope of the outbreak.

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

4.4 Develop a Line List and Record Information About the Additional Cases

For each new case found in the health facility register or through searches in the community and which fits the surveillance case definition, record the collected information on a line list, register and in the case-based reporting form. Where possible, include geo-coordinate. A line list will keep track of pertinent basic data for cases and potential cases as they are identified (See Annex 4E for a sample line list). Record any contacts on the contact listing form and ensure that they are monitored daily for signs and symptoms of the disease over the required time period (See Annex 4F and 4G).

Record information for all cases on a "case reporting form" (See sample at Annex 2A). At least record the following:

(a) patient's name, address, and village or community and locating information (e.g land mark): 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

(b) patient's age and sex: This information is used to describe the characteristics of the population affected by the disease

(c) date of onset of symptoms and date the patient was first seen at the health facility

(d) status of the patient, whether dead or alive: If dead, record date of death

(e) relevant risk factor information such as immunization status if the disease being investigated is a vaccine-preventable disease; or occupation if you suspect that the outbreak targets a particular occupation

(f) 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 found in the Annexes at the end of chapter 11.

(g) complete the case investigation form for any new case(s) details on the line list (Annex 4E)

4.5 Analyse Data About the Outbreak

Outbreak data analysis is similar to the analysis of summary data as described in chapter 3. Data on the outbreak is analysed and re-analysed several times during the course of the outbreak.

During the initial analysis, summarise the outbreak or events and look for clues about where the outbreak or event is occurring, the spread, the source of the outbreak (from a single source such as a well or a funeral), and the persons at risk of becoming ill (for example, young children, refugees, person living in rural areas, etc.). Present the data, taking into account time, place and person analysis (refer to chapter 3) as follows:

(a) draw a histogram representing the course of the disease (an "Epi" curve)

(b) plot the cases on a spot map

(c) make tables of the most relevant characteristics for cases (e.g., age group relative to vaccination status, sex ratio, case occurrence relative to type of occupation, etc.)

(d) calculate case fatality rates (refer to the steps in chapter 3).

(e) apart from calculating the case fatality rate in outbreak situations, you may also wish to calculate the attack rate. See chapter 3 on how to calculate the attack rate.

4.5.1 Interpret Analysis Results

Review the analysis results while identifying potential risk factors about the outbreak. For example:

(a) What was the causative agent of the outbreak?

(b) What was the source of infection?

(c) What was the transmission pattern?

(d) What control measures were implemented and to what effect?

I. Interpret the Time Analysis Results

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

- If the shape of the curve suddenly increases to develop a steep up-slope, and then descends just as rapidly, exposure to the causative agent was probably over a brief period of time. There may be a common source of infection (point source)
- 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.
- Below are some examples of the shapes of epidemic curves and possible interpretation.

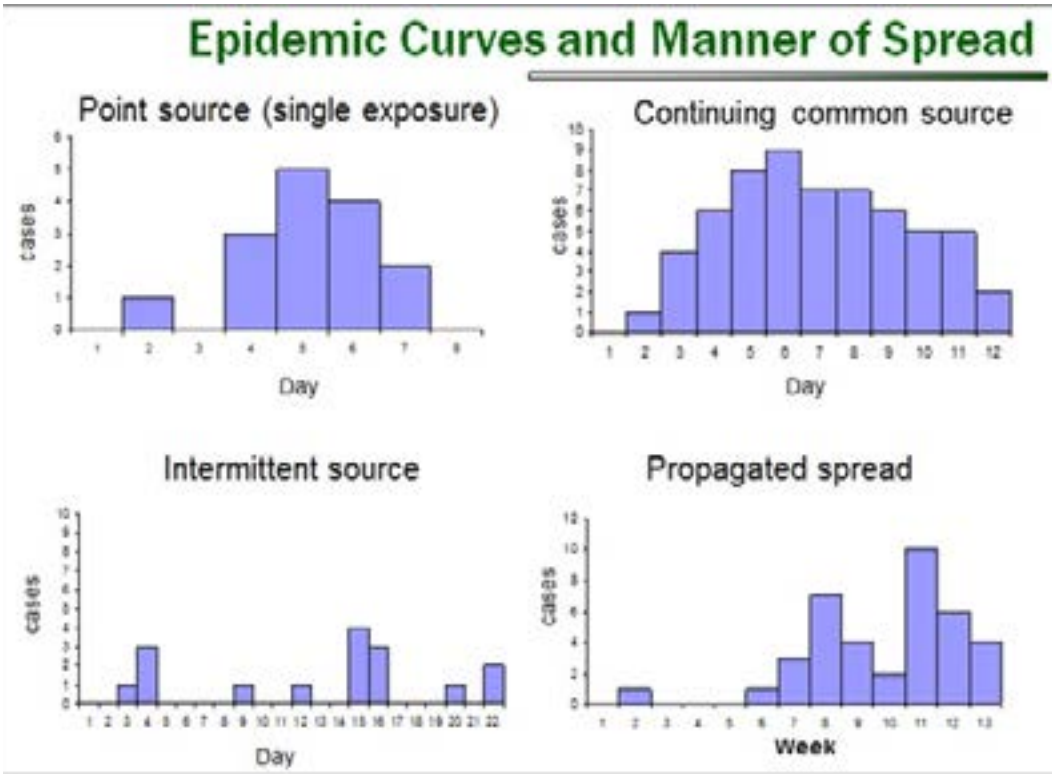


Figure 4.2: Types of epidemic curves and the manner of spread

II. Interprete the Place Analysis Results

Use the map to:

(a) describe the geographical scope of the problem and identify high-risk areas

(b) 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.

III. Interprete the Person Analysis Results

Information generated 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 immunisation response might need to target children who fall within that age bracket.

Below is an example of data analysis by person (age) which shows how the results could be used to plan for interventions. The table shows highest rates of disease among persons aged 15 years and above.

Age group (years)	Number of cases	Population	Attack rate (%)
<5	120	5000	2.4%
5–14	261	12351	2.1%
≥15	352	12075	2.9%
Total	733	29426	2.5%

Table 4.1: Cholera attack rate by age group, Camp A, Country X, March-May 2019

IV. Analyse Data and Generate Hypothesis

(a) Conduct a descriptive analysis of the data (person, place and time).

- From the observations gathered during the descriptive process, a hypothesis can be generated about the causes of observed patterns and the factors that increase risk for a given outbreak. For instance, in Table 4.1 above, one might hypothesize that

the older the patient, the more likely he/she will fall ill. Hence, determine if age is associated with illness.

(b) Using descriptive analysis, generate a hypothesis on the outbreak.

- To test a hypothesis, use the analytic epidemiology process to answer questions on how and why the population was affected.

V. Test and Refine Hypothesis With an Analytical Study

(a) Select the appropriate study design based on descriptive epidemiology and the situation.

(b) Obtain resources to conduct and analyse the study.

(c) Draw conclusions from the study and, as needed, refine the hypothesis.

Various study designs can be used to conduct analytical studies. These include case control studies, cohort studies and experimental studies. One example of an analytical study (case control) to test hypothesis can be found in Annex 4I. Refer to the references for further guidance on how to conduct analytical study designs.

4.6 Report Writing and Dissemination of Findings

All reports (preliminary, interim and final) should always be disseminated, even if no conclusive risk factors have been identified for a given outbreak. Prepare also situation reports (SitReps) of the given outbreak and share with relevant stakeholders. Chapter 7 describes various channels of communication during outbreak.

If risk factors are already known, formulate conclusions and recommendations about the outbreak:

(a) confirmation of the situation as an outbreak or public health problem

(b) population affected and at risk

(c) 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,

(d) measures already initiated to contain the outbreak,

(e) recommendations: For controlling the situation further investigation/studies may be recommended. The LGA rapid investigation team should then immediately prepare an outbreak investigation report and disseminate to the

health facility where the outbreak occurred and to the LGA, state, national and relevant partners.

A suggested outline for writing an investigation report is presented in Annex 4k .

- To understand the spread of the disease, draw a transmission tree starting with the index case: Moreover, the transmission tree facilitates understanding of the relative contributions of different settings to the spread of the disease in a given geographical area and is thus crucial for regulating infection transmission and adopting control measures. Reconstruction of a transmission chain or tree is possible provided the information is obtained from a line list, and a review is conducted on the timeline of dates of illness or contact with other cases, field investigations and rapid risk assessment. The transmission tree is highly relevant as it facilitates documentation of the routes of transmission in a given geographical area and thus makes it easier to plan interventions. The tree needs to be updated frequently and if a new cluster of cases starts in any part of the LGA, ask questions to know if there is any linkage. See Annex 4J for an example of how to draw a transmission tree.

4.7 Implement Prevention and Control Measures

Once an outbreak is identified, control measures are important for interrupting disease transmission and / limiting exposure to the source of infection. If a pathogen or other suspected source of the outbreak is identified, control measures should target specific agents, sources or reservoirs of infection. Chapter11. provides a description of some of the control measures for each priority diseases and references for further reading.

Outbreak control measures are intended to:

(a) control the source

(b) control of secondary transmission

(c) Prevent future outbreaks.

- Control measures should be implemented at the first available point in the investigation and should occur concurrently with other investigation steps. Often, nonspecific control measures can be put in place regardless of the type of disease or source.
- Ensure multi-sectoral engagement throughout response; i.e., at the community level and with other non-health stakeholders who might be crucial to the management of particular outbreaks. Examples if you want to enforce by law, you might need assistance from the Ministry of Internal Affairs (law enforcement agents).
- At some point during the outbreak, the public health response might include testing new potential countermeasures including vaccines and therapeutics. Thus, biomedical research can be an important and discrete component of the response. Public health efforts must always remain at the forefront of the overall outbreak response. The research conducted must be scientifically and ethically sound in order to reach definitive conclusions on efficacy and safety as quickly as possible. It is the role of the National Level to liaise with the Ethical Committees within the country to provide a useful guide for analogous principles in such situations.

4.8 Conduct an assessment to Determine if the Event is a Potential Public Health Emergency of International Concern (PHEIC)

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 sub-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 a potential PHEIC, hence warranting its notification (IHR decision instrument, http://www.who.int/ihr/revised_annex2_guidance.pdf).

4.9 Maintain and Intensify Surveillance

The national and state levels should maintain contact with the LGA for daily updates (cases, deaths, number admitted, number discharged, areas affected, etc.) until the end of the outbreak.

Ensure that the same IDSR mechanism is used to enhance surveillance of events, and that the system is flexible enough to allow adaptation of additional variables to be collected using the existing system. This will avoid parallel reporting which can lead to confusion on the progress of the outbreak.

- periodically, report on progress of response, and prepare daily situation reports which can be used to evaluate the response
- update the line list, conduct data analysis by time, person and place
- monitor effectiveness of the outbreak response activity

During investigation, it is important to intensify surveillance with neighbouring LGAs to ensure that the outbreak does not spread to another LGA. It is important to share information and also plan for joint surveillance and response activities. Neighbouring LGAs may also initiate the establishment of cross-border disease surveillance and response committees so that there is sharing of surveillance data, epidemiological and other related information during the outbreak.

4.10 Conducting Regular Risk Assessment After the Outbreak has been Confirmed

As soon as the outbreak is confirmed, it is important to conduct regular assessment at each stage of the outbreak. The assessment is needed to orient and focus interventions. The risk assessment should include:

(a) evaluating the susceptibility of the population and potential for spread of the event both in the affected and in neighbouring areas

(b) evaluating the risk of further transmission, morbidity and mortality. To that end, the factors that can be considered include population characteristics such as size, density, movement, and setting, under five mortality rates, period of the year (considering potential for seasonal outbreaks) and plans for any festivals or other social events that will result in increased opportunities for spread, access to health services etc.

Risk assessment should be repeated as new information becomes available. It may also be repeated on a regular timetable. For some events, different risk assessment teams may be required to work collaboratively to assemble the information for a composite picture of the risk (e.g. clinical severity, transmission dynamics and control measures). At the conclusion of the event, all the risk assessments should be formally reviewed. The systematic analysis of well documented risk assessments identifies where improvements can be made in the management of acute public health events in future.

4.11 Annexes to Chapter 4

Annex 4A	LGA log of suspected outbreaks and signals
Annex 4B	Checklist of laboratory supplies for use in an outbreak investigation
Annex 4C	Recommended list of personal protective equipment
Annex 4D	How to conduct a register review
Annex 4E	Sample line list
Annex 4F	Contact recording sheet
Annex 4G	Contact tracing form (follow-up)
Annex 4H	Triple packaging of samples during an outbreak
Annex 4I	Example of an analytical study to test hypothesis
Annex 4J	How to create a transmission tree
Annex 4K	Sample LGA outbreak report
Annex 4L	Sample Sitrep template

Please refer to http://ncdc.gov.ng/idsr_forms for samples of these forms

Annex 4A: LGA Log of Suspected Outbreaks and Signals

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

Disease/ Condition / Event (1)	Source of suspected outbreak or signal (newspaper, telephone etc.) (2)	Number of cases initially reported (3)	Number of deaths initially reported (4)	Location (health centre) (5)	Date LGA was notified (6)	Date suspected outbreak was investigated by the LGA (7)	Result of LGA investigation (Confirmed, Ruled Out, or Unknown) (8)	Date outbreak began (9)

Date onset of index case (10)	Date crossed threshold or first cluster (11)	Date a case was first seen at a health facility (12)	Date specific intervention began (13)	Type of concrete intervention that was begun (14)	Date on which LGA notified State level of the outbreak (15)	Date LGA received State response (16)	Comment (include if sample taken and results) (17)	Name and signature

Annex 4A: LGA Log of Suspected Outbreaks and Signals

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

_____Antiseptic liquid for hand-washing
_____Alcohol hand scrub (sanitizer)
_____Chlorine or bleach for decontamination
_____Supply of PPEs (gloves, mask, gowns, etc.)
_____Triple package and refrigerant for sample transportation,
_____Safety boxes for collecting and disposing of contaminated supplies
_____Equipment (Biosafety cabinet)

For collecting laboratory specimens:

Blood

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

Blood films (malaria)

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

Respiratory specimens

_____ Sterile swabs sticks
_____ Viral transport medium

Cerebrospinal fluid (CSF)

_____ Local anaesthetic
_____ Needle and syringe for anaesthetic
_____ Antiseptic skin disinfectant
_____ Sterile screw-top tubes, Cryotube, dry tube, sterile gloves, surgical mask, sterile gauze, adhesive bandage, lumbar puncture needle,
_____ Microscope slides in a box
_____ Trans-Isolate transport medium
_____ Latex kit
_____ Gram stain
_____ May Grunewald Giemsa Kit

Stool

_____ Stool containers
_____ Rectal swabs
_____ Cary-Blair transport medium
_____ Cholera rapid test kits

Plague

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

If health facility has a centrifuge:

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

Annex 4B: Checklist of Laboratory Supplies for Use in an Outbreak Investigation

For packaging and transporting samples:

_____ Cold box with frozen ice packs or vacuum flask
_____ Cotton wool for cushioning sample to avoid breakage secondary and tertiary containers for triple packaging
_____ Labels for addressing items to lab
_____ Labels for marking "store in a refrigerator" on outside of the shipping box
_____ Case forms and line lists to act as specimen transmittal form Zip lock bags for transporting specimen transmittal form
_____ marking pen to mark tubes with patient's name and ID number (if assigned by the LGA)

Reagents and supplies for testing

_____Reagents
_____Media (MacConkey, Blood agar,
____ Others

Appropriate Personal Protective Equipment (PPE) (for all epidemic prone diseases such as VHF, suspected avian influenza, etc.)

In some events which present with fever, it might be important to carry rapid diagnostic kits for malaria (mRDT) if they are not available in a nearby health facility

Annex 4C: Recommended List of Personal Protective Equipment (PPE)

The following equipment should be available for the personal protection of all staff investigating a suspected case with highly infectious disease; e.g., viral haemorrhagic fever, avian influenza etc. (See reference for the guidelines to use and select PPE at the end of the chapter). The equipment should be held at state level, if the PPE kits are inadequate; the PPE should be prepositioned in high-risk states which are likely to report these specific outbreaks or which have been identified to be at risk through risk assessment. See Annex 5A for other stocks that may be needed to respond to a suspected outbreak

Composition of one set of PPE	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*	-
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 tapes	3 rolls
Anti-fog for goggles	3 bottles
Chlorine	-

Chlorine and gum boots can be purchased locally; biohazard bags for PPE/Waste management must be purchased

*** Not essential**

Annex 4D: LGA Log of Suspected Outbreaks and Signals

1. Background

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. The register should be used for:

- any inpatient facility with more than 10 hospital beds. Give priority to government health facilities
- large reference or teaching hospitals with pediatric wards because they receive referrals from other health facilities
- small hospitals or health facilities that serve remote areas and high-risk populations. Examples are 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. Emphasize that the activity is an information-gathering exercise and not a review of health worker performance.

3. Arrange to Conduct the Review.

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

4. Identify Sources of Information.

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

Review the system and procedures health workers use to record information in the registers about diagnoses. Make sure that the information needed for investigating any suspected case is available.

At a minimum, the register should include:

- the patient's name and location
- the signs and symptoms
- date of onset of symptoms and outcome (for example, date of death, if relevant)
- immunization status, if appropriate to this disease.

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

5. Conduct the Record Review at the Scheduled Date 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 a priority disease. 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 the 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 activity. Use the opportunity to review any features of case management for the illness that may help health workers in the facility. Reinforce the importance of immediate reporting and case investigation as tools for prevention of priority diseases and conditions. Use this opportunity to emphasize on the need for IPC and minimum PPE.

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 4E: Sample Line List

State:_____ Disease/condition/event: _____ Name of reporting officer: _____

No.	Name of patient	Epid ID	LGA	Ward	Village/ Settelements	Residential address	Age	Sex (M/F)	Occupation	Date of Onset
1										
2										
3										
4										
5										
6										
7										
8										
9										

Date seen at HF	Vacci-nation status (Y/N)	Date of last vacci-nation	Speci-men	Results	Hospi-talized (Y/N)	Place of admis-sion	Treat-ment given	Outcome	Date of dis-charge or death	Comments

Annex 4F: Contacts Listing Sheet

Contacts1 Recording Sheet filled in by _____
Case name_____
Case number (if assigned) _____
Case's Village/neighbourhood _____
Chief or Community leader _____
LGA/Town _____State _____
Date of symptom onset_____ Hospitalized/Found in the community_____
If hospitalized, Hospital _____
Date of Admission: _____

	Other name	Relationship with the case	Health worker (Y/N) , if yes which facility ?	Age (years)	Sex (M/F)	Phone number	Head of household

Village/ neighbourhood	Chief or Community leader	LGA/Town	Type of Contact (1, 2 or 3, list all)	Date of last contact	Last date for follow-up	First Visit	Outcome

Contacts are defined as persons who:

1. sleep in the same household with a suspected case;
2. have direct physical contact with the case (dead or alive);
3. have touched the linen or body fluids of the case;
4. have eaten or touched a sick or dead animal.

Annex 4G: Contact Tracing Form (Follow-up)

Contact Tracing Form – by Village Team .....
Volunteer's name .....
Village .....
Chief or Community leader.....
LGA/Town .....
State .....

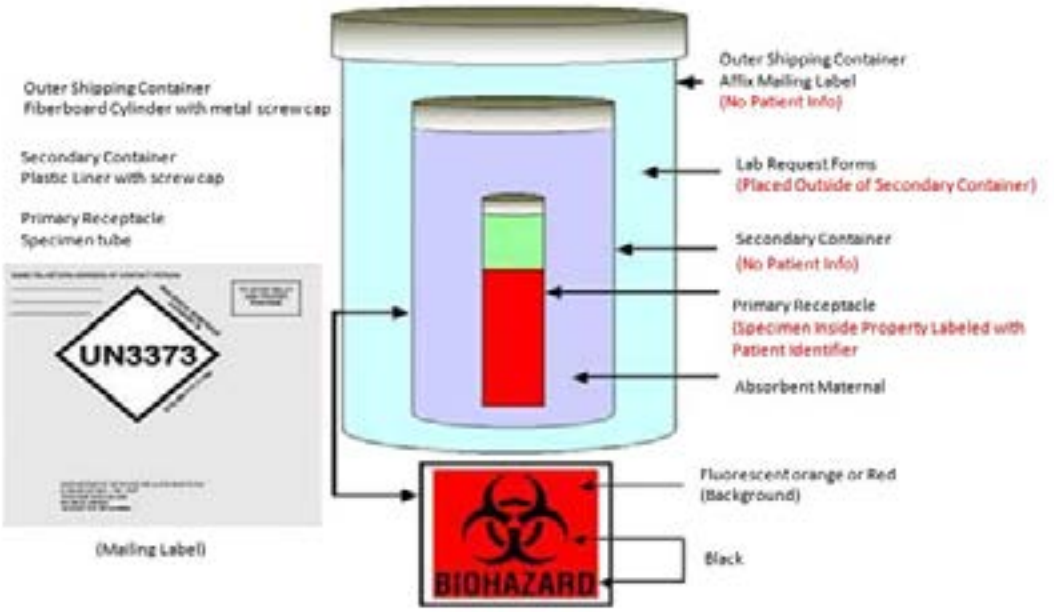
Record "O" if the contact has not developed fever or bleeding

CN	Family Name	First Name	Address	Phone Number	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 "X" if the contact has died or developed fever and/or bleeding (complete Case Investigation Form and, if alive, refer to the hospital)

Annex 4H: Types of Triple Packaging of Samples During an Outbreak



Source: https://medicine-science-and-more.com

Annex 4I: Example of an Analytical Study to Test Hypothesis

Case control study to determine potential exposures to Cholera in Central African Republic. The unadjusted matched analysis indicates that persons who ate cold cassava leaves (one of the staple foods in the region (Odds ratio (OR) = 3.07; 95% Confidence Interval (CI) = [1.155; 8.163]; P = 0.020)) were at greater odds of having cholera. The association was statistically significant at $P < 0.05$.

Risk factors	Odds ratio	95% Confidence interval	P values
Drinking water from the Oubangui river	1.16	[0.415 ; 3.239]	0.983
Drinking water sold on the street	0.25	[0.027 ; 2.421]	0.422
Eating cold cassava leaves	3.07	[1.155 ; 8.163]	0.020
Eating hot cassava leaves	0.57	[0.090 ; 3.669]	0.900
Attending funerals from September 2011	0.56	[0.192 ; 1.643]	0.627
Washing hands after using the toilet	0.85	[0.295 ; 2.493]	0.395
Eating outside	0.66	[0.259 ; 1.713]	0.206
Eating dried meats	0.45	[0.184 ; 1.208]	0.062
Eating fresh meats	0.41	[0.143 ; 1.228]	0.060
Eating hot smoked fish	0.83	[0.328 ; 2.111]	0.354
Eating cold smoked fish	0.89	[0.360 ; 2.235]	0.410
Washing hands before eating	1.05	[0.318 ; 3.512]	0.466

Excerpt obtianed from: https://www.cdcfoundation.org/sites/default/files/upload/pdf/2011CholeraOutbreakReport.pdf

Annex 4J: An Example on How to Create a Transmission Tree

Consider the following scenario which describes an outbreak of a respiratory illness, where the investigation team had information on 13 cases.

(a) The first case was a 25-year old university student with onset of symptoms on 21 March 2012. He was admitted to Zarqa public hospital on 4 April 2012 after a week of coughing, fever and shortness of breath. The patient was diagnosed with pneumonia and pericarditis, and he was soon transferred to the coronary care unit (CCU). As his condition worsened, he was transferred to Prince Hamzah hospital for further treatment; he was intubated in ICU the next day and died on 25 April 2012. Investigators were told that during his illness, the patient was in close contact with his mother (who did not report illness) and two health care workers (cases 2 & 3). His illness was later laboratory-confirmed as the novel coronavirus (3).

(b) The second case was a 30-year-old male nurse in the CCU at Zarqa hospital. His symptoms started about 29 March 2012. He had not travelled or had contact with animals in the 10 days prior to his illness, though he was in close proximity to the first case in the CCU. On 8 April, case 2 was admitted to the CCU at Zarqa with shortness of breath and pneumonia and was later discharged with no sequelae from Islamic hospital on 23 April. The patient was in close contact with two household members, including his mother (case 13) and a man that did not get sick (who was also the brother of case 3) (3).

(c) Case 3 was a 40-year-old female nurse in the ICU at Zarqa hospital whose illness was laboratory-confirmed after her death. Her symptoms began on 2 April 2012, and she was admitted to Zarqa hospital ICU after developing pneumonia 7 days later. She was later transferred to ICU at Islamic hospital where she died on 19 April. During her illness, she was in close contact with 4 household members, including another brother who fell ill 10-days post exposure (case 9), and three others that were not affected. One month prior to her illness, her sister had visited from Saudi Arabia (3).

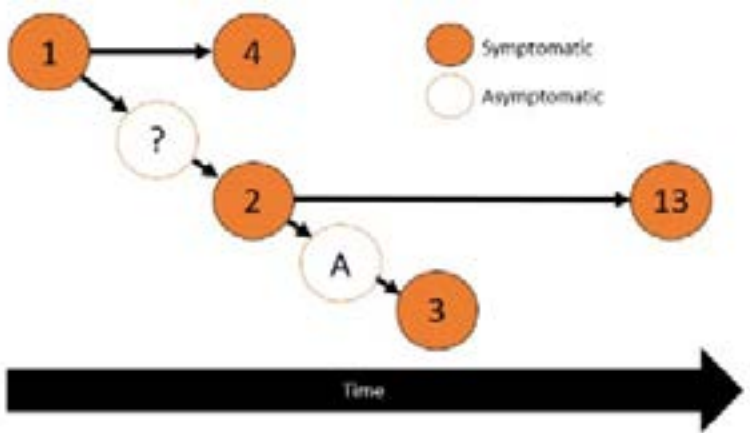
(d) Case 4 was a 65-year-old male doctor whose symptoms of fever and fatigue started 2 April 2012 and developed into pneumonia. The doctor opted to stay home during his illness and soon recovered. He had not travelled or had contact with animals in the 10-days prior to his illness. His household members did not report any illness (3).

(e) Cases 5 through 13 occurred in the second phase of the outbreak, with the

Annex 4J: An Example on How to Create a Transmission Tree

onset of symptoms occurring between 11-26 April 2012. All except case 13, who was the mother of case 2, had direct contact with one or both laboratory-confirmed cases. None of the health care workers had travelled or had contact with animals. The health care workers reported that they only used gloves when treating patients to avoid stigmatizing them.

Based on this information, and a line list, a transmission tree can be sketched as follows:



Footnote: Extract from "Applied Public Health Case Study Scenarios for Training Public Health Professionals. Case studies developed under CDC/AFENET agreement". Transforming Public Health Surveillance. (pages: In press). Location: Elsevier

Annex 4k: Sample LGA Outbreak Report

Title/Description (include disease/condition investigated) _____
Period_____ Place (village, neighbourhood, LGA, State) _____
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, Wards, other)
- Case finding (indicate what was done regarding case finding, e.g., register review, contact investigation, alerting other health facilities, other)
- Lab specimen 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
- Detailed results by time (epi curve), place (maps), and person characteristics (tables) and line lists
- Results of response and evidence of impact

IV: Self-evaluation of the timeliness and quality of preparedness, out break 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 public health emergency preparedness and response committee regularly meet as part of the epidemic response?		

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] and 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 LGA 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] and notification to the LGA [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	Date	Interval
Interval between notification of LGA [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 LGA [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 LGA [date 1] and concrete response by the LGA[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, LGA, partners, provincial and national
LGA Public Health Emergency Management Committee Chairperson:

Name:_____ Signature/Date _____
LGPHC Coordinator/Medical Officer of Health: _____
Name: _____ Signature/Date_____
Date report completed: _____

Annex 4I: Sample Sitrep Template

__ (insert state's name)__ State __(disease)_ Outbreak Situation Report dd/mm/yy

Highlights

- Xxxx
- Xxxxx
- Xxxxx

A. Epi Summary

S/No.	Description	New (Daily)	Total for epi-week xx (Monday-Sunday)	Cumulative (1st Jan till date)
Cases				
1	Suspected cases	**0**		
2	Lab-confirmed positive cases	**0**		
3	Lab-confirmed positive cases in Health care Worker(s)	**0**		
4	Probable cases	**0**		
5	Rumour under investigation	**0**		
6	Number of confirmed cases on admission	**0**		
7	Number of confirmed cases discharged	**0**		
8	Number of deaths in confirmed cases	**0**		
9	Number of deaths in Health care workers	**0**		
10	Number of deaths in suspected cases	**0**		
Contacts				
11	Contacts listed	**0**		
12	Contacts seen	**0**		
13	Contacts currently under follow up	**0**		
14	Contacts symptomatic	**0**		
15	Contacts confirmed positive	**0**		
16	Contacts who completed 21 days follow up	**0**		
17	Contacts lost to follow Up	**0**		
Laboratory				
18	Number of specimens collected	**0**		
19	Number of specimens tested negative	**0**		
20	Number of pending laboratory samples	**0**		

1. State Epicurve (Alive & deaths -confirmed cases only)
2. State Dot/choropleth Map (updated weekly)
3. High burden LGA specific Epi-curves (updated weekly)
4. Age sex distribution chart (weekly)
5. Table- Summary of samples/cases by LGA of residence (Hot spot state only)
6. Table- Summary of contact tracing (Hot spot states only)

C. Pillar Response Summary

1. Coordination
2. Surveillance
   a. Summary of contact tracing
   b. Summary of active case finding
3. Laboratory
4. Case management
5. Infection Prevention and Control / Safe burial
6. Risk communication/Social mobilisation
7. Logistics

D. Challenges

E. Response Activities

F. Planned Activities for Next Day

G. Team Composition

4.12 References

1. Ministry of Health Liberia, National Technical Guidelines for Integrated Disease Surveillance and Response, June 2016
2. Government of Sierra Leone. Ministry of Health and Sanitation. Technical Guidelines for IDSR. April,2015
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5. A guide for establishing community-based surveillance disease surveillance and response programme. WHO, Disease Prevention and Control Cluster, 2014
6. The United Republic of Tanzania, Ministry of Health and Social Welfare, National IDSR guidelines, 2nd edition 2011
7. FETP Basic Course Curriculum (Tanzania model)
8. WHO updates personal protective equipment guidelines for Ebola response
9. Guidance for the Selection and Use of Personal Protective Equipment in Health care Settings. https://www.cdc.gov/hai/prevent/ppe.html
10. www.searo.who.int/topics/disease_outbreaks/en/
11. WHO. Weekly Epidemiological Record No 51/52, 577-588,19 December 2014(http://www.who.int/wer).][pokjhx

    Epidemiological study designs. http://www.who.int/ipcs/publications/ehc/216 disinfectants_part_4.pdf

5.0 Prepare to Respond to Outbreaks and Other Public Health Events

Rapid and effective response to a public health emergency such as a suspected outbreak or other public health event not only calls for an immediate response but is also one of the core capacities required by International Health Regulations 2005. Being prepared to detect and respond to such an event is an essential role of the LGA, State and national levels.

Preparedness for public health events include:

(a) Establishment of the Public Health Emergency Management Committee (PHEMC); this is synonymous with EPR committee

(b) Development of functional Public Health Emergency Operating Centres (PHEOC) that will act as a command and control centre for coordination of public health emergencies or events/incidents at the national level as well as a similar coordination structure at the subnational level

(c) Development of policies, plans and procedures for conducting operations, mapping available resources, estimating and procuring the required supplies and conducting simulation exercises to test systems

(d) Identification and training of key members of Public Health Emergency Management Subcommittees and Public Health Emergency Rapid Response Teams (PHERRT).

In addition, having a public health emergency preparedness and response plan (PHEPR) is crucial. The PHEPR should include the layout of the coordinating structure, the mapping of risks and how to address and maintain the emergency response plan for relevant events, including the capacity to support operations at primary response level during a public health emergency. The PHEPR is the overarching plan and should be complemented by a PHEOC plan and an event specific incident action plan (IAP). The PHEOC plan guides the operations of the command and coordination centre, outlining standard operating procedures on how each functional area operates and how they work together; and the IAP is a plan developed to address high priority emergency events based on risk analysis and is always annexed to the PHEPR plan.

5.1 Establish a Permanent Public Health Emergency Operations Centre (Command and Control Centre) for Oversight Of Public Health Emergency Preparedness and Response Activities

Response to public health events would be successful if there is a more, coherent, effective and efficient coordination of various actors representing a multisectoral team within the context of One-Health approach. Ultimately, this will also help to reduce the impact of the event in the community. The International Health Regulations (IHR 2005) require that Member States develop, strengthen and maintain their capacity to respond promptly and effectively to public health risks and public health emergencies.

The Nigeria Centre for Disease Control has established a National Public Health Emergency Operations Centre (PHEOC). In addition, NCDC has supported states to establish State PHEOCs The PHEOC act as a command and control centre that enhances coordination and oversees public health emergency preparedness and response activities. The PHEOC is a hub for the coordination of information and resources to support incident or event management activities, thus ensuring a coordinated response to emergencies that involve health consequences and public health threats.

The national PHEOC has developed the following essential elements so as to be fully functional in its support to emergency preparedness and response:

(a) plans and procedures for operations
(b) telecommunication technology and infrastructure to enable timely communication
(c) information system to support informed decision-making
(d) trained human resources.

The PHEOC monitor events using various sources of data, facilitate and improve communication between public health and emergency management personnel, and facilitate coordination with multiple response partners. The PHEOC feeds into the National Disaster Risk Management EOC to manage escalated events of national magnitude. The PHEOC is located in the Nigeria Centre for Disease Control at the national level while at the state level, the PHEOCs are located in SMoH/SPHCDA

During public health emergencies, the PHEOC, which is the command and control centre guided by the National PHEMC, is activated and functions as a centre for decision-making and the coordination of information and resources for strategic management of public health events and emergencies. The PHEOC uses the Incident Management System (IMS), which is a standardized approach to managing and coordinating the response by providing a common hierarchy for staff response. In the context of IDSR, the IMS is represented by the Public Health Emergency Management Committee (PHEMC) at strategic level, which will assemble during activation of PHEOC; as well as the National Public Health Emergency Management Subcommittees which are also present at the operational level. The IMS outlines the specific roles and responsibilities of responders during an event, while providing a common framework for government, the private sector and non-governmental organizations to work seamlessly together. In IMS, each person is assigned a specific role and follows a set command structure. It can be staffed with additional teams of subject matter experts, analysts, logisticians and support staff depending on the situation at that particular time. The operational structure of PHEOC (command and control centre) can also be scaled up, which is essential for maintaining its effectiveness and it can be modular (i.e. can be partially or fully activated) depending on situational needs (See WHO Framework for a Public Health Emergency Operation Centre).

Most importantly, IMS should be functional at all levels of health system delivery (national, State and LGA). Once the IMS is activated during public health emergencies, it is important for the PHEMC to meet regularly (at least daily or weekly) to facilitate coordination, communication and information-sharing, adopt containment measures, and facilitate the deployment of the Public Health Emergency Rapid Response Team (PHERRT). During activation, the PHEOC will also help to ensure the flow of information horizontally and vertically to the respective departments, relevant sectors and partners, thus facilitating relief operations.

Having a command and control centre is essential for preparedness and response to public health events. If the resources are available, States and LGAs will need to have PHEOCs, with basic facilities that support the direct coordination of preparedness and response to public health emergencies, facilitate real-time communication and information between various stakeholders at their levels, and ensure that there is a mechanism for sharing information with the national

and sub-national levels PHEOCs. These structures should be used to continue supporting the coordination of preparedness and response activities, to ensure real-time communication and information-sharing between various actors at the sub-national and the national level.

When inactive, the PHEOC (command and control centre) usually reduces in size and respective members under various Public Health Emergency Response Management Subcommittees return to their respective working stations. The few staff remaining at the centre should then liaise with respective sections or departments to continue maintaining plans and procedures, conducting training and simulation exercises as well as routine and event-based surveillance activities. They should maintain the systematic database of the resources available, such as important phone numbers, names and addresses of important government and non-government officials, international bodies and NGOs.

5.2 Establish a LGA, State, and National Public Health Emergency Management Committee (PHEMC)

Public health emergency management committees (PHEMC) should be established at all levels – national, State and LGA. PHEMC members across all levels should work closely with their counterparts to plan and monitor the implementation of public health emergency plans. These coordinating committees should operate at their respective levels and are composed of technical and non-technical members from the health and other sectors. The role of PHEMC is to develop and oversee the implementation of emergency preparedness strategies, action plans and procedures.

The PHEMC can also be referred to as a policy group. At the national level, the PHEMC provides policy direction on the implementation and operation of the national PHEOC and also provides oversight, policy and strategic guidance on the implementation of functional PHEOCs or similar coordination structures or mechanisms at the subnational levels.

The PHEMC will also mobilise funds for PHEOC development and sustainability. The PHEMC will provide oversight for PHEOC operations and, in the absence of pre-established mutual aid arrangements with other jurisdictions, it may also be the authority that handles requests for external material or financial assistance, particularly in complex, multisectoral or multijurisdictional emergencies.

5.2.1 Identify Functions of the Public Health Emergency Management Committee (PHEMC)

(a) Ensure coordination and integration of surveillance and response activities across all levels.

(b) Develop a national/State/LGA emergency preparedness and response plan to manage all potential emergencies including disease outbreaks and detection of other emerging public health events or hazards; and clearly stipulate surge capacity to respond to public health emergency at LGA, State or national level.

(c) Map available human and material resources: experts, logistics including distribution, finance, etc.

(d) Periodically review and update the plan in response to any changes in technical, managerial or epidemiological situation or any other risk identified.

(e) Liaise with National Emergency Management Agency (NEMA), SEMA and LEMA to ensure multi-sectoral preparedness and response.

(f) Establish a community communications plan for sharing information with communities before, during and after any public health emergency. The plan should include mapping of all communication channels--community radio, data on cellular and internet penetration, NGO/FBO networks, prearranged agreements with cellular companies, other platforms (women's groups etc.) that can be leveraged for reaching the public. The plan should also include liaison activities with relevant partners in multiple sectors including points of entry and other required reporting sites.

(g) Coordinate community risk mapping activities within the LGA and ensure that all reporting sites are aware of the use of thresholds for reporting acute outbreaks or events.

(h) Identify and mobilise resources for emergency prevention and control including procurement of response and communication supplies. There should also be a mechanism to monitor the use of resources before, during and after the emergency event.

(i) Ensure that emergency material stockpiles at the LGA/State/National levels are monitored, procured and updated regularly.

(j) Enhance linkages with community-based surveillance focal persons to ensure flow of data for early detection of public health events.

(k) Coordinate training of community, health facility, and LGA/State/national personnel in emergency preparedness and response.

(l) Ensure that there is periodic organisation of emergency response simulation activities at the national, State, LGA and community levels.

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

(n) Ensure provision of efficient administrative and financial management support including human resources, cash flow by estimating, tracking and approving response-related expenditure, monitoring and coordination of funding from all sources.

(o) Ensure that the facilities' communication technology and information system is ready to support any type of emergency.

(p) Oversee the activation of the national PHEOC and similar coordination structures at the subnational level (State and LGA), during public health emergencies. Furthermore, activation of the IMS structure; i.e., formation of Public Health Emergency Management Subcommittees and deployment of the Public Health Emergency Rapid Response Teams.

(q) Hold regular meetings to strengthen preparedness capacity (e.g., training health care workers) during periods when there are no public health emergencies.

5.2.2 Identify Members of the Public Health Emergency Management Committees (PHEMC)

Organise the PHEMC to include a mix of representatives from the public, non-governmental organisations (NGO) and private sectors to match the functions listed above. For example, in the LGA level committee, participants from public sector may include:

(a) LGA Chairman or administrator/coordinating director or equivalent

(b) LGA Divisional Police Officer

(c) Community representative

(d) LGA Director PHC/medical-officer-of -health/ PHC coordinators/ HOD Health
(e) Medical superintendents-in charge of hospitals
(f) LGA director of veterinary/agricultural services or equivalent
(g) LGA public health nurse
(h) LGA DSNO
(i) LGA environmental health officer or equivalent
(j) LGA Education officer
(k) LGA WASH officer
(l) LGA engineer
(m) Wildlife officer
(n) Natural resources and veterinary officers
(o) Medical laboratory Scientist / technician from the LGA laboratory (for both human and animals)
(p) LGA community development officer
(q) Immigration Officer
(r) Officer responsible for risk communication/ LGA Health educator/ health promotion officer
(s) Legal officer
(t) Senior military / national security officer
(u) Influential leaders - Members of parliament, tribal chiefs, religious leaders, etc.

At the State and national levels, an equivalent of the above should be used in order to ensure a more comprehensive multi sectoral structure. At the national level, consider including directors from other key relevant ministries, heads of agencies, national health research institutes (human and animal). Members of the IHR National Focal Point should always be part of the national team.

From non-governmental organisations with health care activities in the area, include representatives from:

(a) Community health programmes and faith-based health facilities
(b) Partners or similar agencies working in the area

(c) Local NGOs

(d) Civil society organisations

(e) UN organisations.

From the private sector, include representatives from:

(a) Private health facilities

(b) Private laboratories

(c) Pharmacists or chemists

(d) Business community

(e) Research and training institutions

(f) Professional associations

The PHEMC should have a chairperson; e.g. someone holding the highest political position in the LGA.

5.2.3 Public Health Emergency Management Committee (PHEMC) Meetings

When there is no outbreak or any other public health event, the PHEMC should meet regularly, on a monthly or quarterly basis, in order to:

(a) Review the national public health emergency preparedness and response plan

(b) Exchange information on risk monitoring. It should be emphasized that other relevant health sectors can equally benefit from information provided by the human health sector and vice versa. In some events, human cases can be the first indication of a threat to other sectors.

(c) Review disease trends and updates on preparedness steps

(d) Review the level of preparedness at the beginning of each epidemic season (e.g., before the period when cases of meningitis increase)

(e) Monitor stocks of equipment for outbreak investigation and response

(f) Share the conclusions and recommendations of these meetings with respective committees at all levels

(g) Organise simulation exercises/drills to test the effectiveness and efficiency of the EPR plans.

If PHEOC is already established, it should serve as a hub for coordinating these activities. If not, a similar coordination structure or mechanism should serve the same purpose.

During an emergency or outbreak response, the PHEMC should:

(a) Meet as soon as the outbreak or event is established

(b) Conduct situational analysis and grade the level of the event

(c) Activate the PHEOC or similar coordinating structures at the national and subnational levels and deploy PHERRT to the field to investigate and respond to the event. It will also activate the Public Health Emergency Management Subcommittees (See 5.3 for a detailed description of part of the technical teams with their roles and responsibilities)

(d) Assess the need for and request support from the higher level, if need be. For example, LGA will request support from the State or national EPR or Public Health Emergency Rapid Response Teams when necessary

(e) Meet at least daily at the beginning of an outbreak or event and weekly as the response continues

(f) Regularly review the outbreak response and take action to improve outbreak control actions as indicated

(g) Document and communicate outbreak response actions to the next higher level

(h) Conduct an after-action review

5.3 Establish Public Health Emergency Management Subcommittees at all Levels

The Public Health Emergency Response Subcommittees are formed by the PHEMC to oversee the daily management of the public health emergencies. They consist of technical and non-technical teams, tasked with oversight of the daily management of the event/incident and provide feedback to the PHEMC committee for decision-making.

They are subdivided into technical and non-technical teams depending on their functions as shown Table 5.1

Subcommittee	Members (experts, organizations)	Description of tasks
Coordination/ Management subcommittee	**Overall Chair EPR: (Permanent Secretary/ Director Public Health, at national and subnational levels, appointed Government officials in the rank of Administrative Officials, PHC coordinator or medical officers of Health or similar**) **Example of members at the LGA level:** • LGA administrator / coordinating coordinator or equivalent • LGA Divisional police officer • Traditional / Religious leaders • LGA civic or community representative (for example, the LGA chief executive) • LGA PHC coordinator/ Medical Officer of Health • Medical officer/Medical director in-charge of facility • Medical superintendents-in charge of hospitals • Area Veterinary officer or equivalent • LGA public health nurse • LGA DSNO • LGA environmental health officer or equivalent • LGA education officer • LGA water officer/WASH officer • LGA engineer • LGA pharmacist/ Logistic officer • Wildlife officer and Natural resources • Local Immunization officer (where applicable) • Medical Laboratory scientist/technician or laboratory technologist from the LGA laboratory, both human and animal • LGA community development officer • Immigration officer • Officer responsible for risk communication	• Coordinate all aspects of the operations response, planning and management including: Selecting participating organizations and assign responsibilities • Design, implement and evaluate control interventions • Coordinate technical EPR subcommittees and overall liaison with partners • Submit daily situation report on the evolution of the outbreak • Manage information for the public and news media • Provide operational support including mobilisation of resources • Ensure staff well-being, security
	From non-governmental organizations with health care activities in the area, include representatives from: • Community health programmes and faith-based health facilities • Partners / similar agencies working in the area • Local NGOs • Civil society organisations From the private sector, include representatives from: • private health facilities • private laboratories • pharmacists or chemists • business community • research and training institutions • professional associations	

Table 5.1 Functions of Public Health Emergency Management Subcommittees

(iii) Planning

(i) Finance and Administration

Finance and Administration	Chair: PS at State/National level LGA level: LGA Administrator/Executive Officer/Planning and Budget Officer **Members:** • May include experienced health administrators, finance/accounts officers, budget officers and logisticians. Technical Staff -LGA Medical Officer or Medical Officer in Charge, Laboratorians	• Track expenditure, makes payments and provide administrative services • Ensure appropriate cash flow management, track material and human resources, monitor costs, prepare and monitor the budget and • Keep administrative records

(ii) Logistics

Logistics	Chair: Pharmacist/ Logistics Officer **Members:** Supplies/ Stores assistants Pharmacists or dispensers Technical assistance from the Ministry of Health Partners supporting logistics management	• Provide budget support/ funding for epidemic preparedness & response Procure equipment and supplies • Maintain adequate stocks of supplies and equipment • Arrange for transport and communication systems • Liaise with other agencies for logistical support • Provide accountability for all the resources used during epidemic preparedness & response

(iii) Planning

Planning	**Chair: An appointed Government official in the rank of administrative official or similar)** **Members:** Chairs of the all subcommittee Appointed members from EPR/ PHEMC committee	• Evaluate the situation (information gathering and analysis), evaluates available options and monitors resources.

(iv) Technical Subcommittees

Subcommittee	Members (experts, organizations)	Description of tasks
Case management and infection prevention and control	**Chair:** Physician or clinicians from Ministry of Health, or the LGA, State or referral hospital Example of members at the LGA level: • LGA divisional police officer • LGA director of health services • LGA medical officer • Medical superintendents-in charge of hospitals • Area Veterinary officer or equivalent • LGA public health nurse • LGA pharmacists • LGA disease control officer or equivalent • LGA environmental health officer or equivalent • LGA education officer • LGA water officer • LGA engineer • Wildlife/Natural resource officer • Medical Laboratory scientist/ technician or laboratory technologist from the LGA laboratory, both human and animal • LGA community development officer • Military/Paramilitary • Port Health Services From NGOs with health care activities in the area, include representatives from: • Community health programmes and faith-based health facilities • Partners or similar agencies working in the area • Local NGOs • Civil society organisations	• Ensure the availability of guidelines and SOPs for case management and infection prevention and control in all health facilities • Strengthen isolation facilities and reinforces infection prevention and control measures • Conduct risk assessment of health care workers • Ensure that appropriate medical care is provided to patients • Provide ambulance services – collection of suspected cases from the community using the defined referral system • Collect data from all treatment facilities (if available) and submit it to the surveillance subcommittee • Ensure appropriate disinfection of homes and environments with suspected/ probable/ confirmed cases/ deaths of an infectious disease • Conduct safe burial of the dead from isolation facilities and community deaths • Ensure the training and refresher training of health workers in the isolation facility and other health facilities in the affected LGA

Subcommittee	Members (experts, organizations)	Description of tasks
	From the private sector, involve participation from: • private health facilities • private laboratories • pharmaceutical company • business community • research and training institutions • professional associations	
Surveillance and Laboratory	**Chair:** Surveillance Officer or Epidemiologist (National/State/LGA levels) **Co-chair:** Laboratory Focal Person **Example of members at the LGA level:** • LGA DPO • LGA PHC Coordinator /Medical officer of health • LGA medical officer • Medical superintendents-in charge of hospitals • Area Veterinary Officer or equivalent • LGA public health nurse • LGA DSNO or equivalent • LGA environmental health officer or equivalent • LGA education officer • LGA water officer • LGA engineer • Wildlife/Natural Resource officer • Medical Laboratory scientist/technician or laboratory technologist from the LGA laboratory, both human and animal • LGA community development officer • Immigration officer • LGA psycho-socio counsellors • Port Health officer From nongovernmental organizations with health care activities in the area, include representatives from: • Community health programmes and faith-based health facilities • Partners or similar agencies working in the area • Local NGOs • Civil society organizations From the private sector, include representatives from: • A representative from private health facilities • A representative from private laboratories	• Ensure the availability of all surveillance guidelines and tools in the health facilities • Ensure the use of the outbreak case definition • Conduct active case finding, case investigation, contact tracing and follow-up • Verify suspected cases/ alerts/ rumours in the community • Ensures proper filling of case investigation, contact tracing and follow-up forms • Ensure proper collection, packaging, transport, and testing of specimens from suspected/ probable cases/ deaths • Communicate test results to clinical services • Conduct data management and provides regular epidemiological analysis and reports • Train health personnel in disease surveillance • Ensure close linkage with burial, infection control and social mobilisation groups.

Subcommittee	Members (experts, organizations)	Description of tasks
	• Pharmacists or chemists • Representatives of business community • Research and training institutions • Professional associations	
Risk Communication and Social Mobilisation	**Chair:** Health promotion/ education officer **Example of members at the LGA level:** • LGA DPO • LGA PHC Coordinator/ Medical Officer of health • LGA medical officer • Medical superintendents-in charge of hospitals • Area Veterinary Officers or equivalent • LGA public health nurse • LGA DSNO or equivalent • LGA environmental health officer or equivalent • LGA education officer • LGA water officer • LGA engineer • Wildlife/Natural Resource officer • Medical Laboratory scientist/ technician or laboratory technologist from the LGA laboratory, both human and animal • LGA community development officer • Immigration officer From nongovernmental organizations with health care activities in the area, include representatives from: • Community health programmes and faith-based health facilities • Partners or similar agencies working in the area • Local NGOs • Civil society organisations From the private sector, include representatives from: • private health facilities • private laboratories • business community • research and training institutions • professional associations	• Ensure the availability of risk communication materials and plans • Conduct rapid assessment to establish community knowledge, attitudes, practices and behaviour on prevailing public health risks/events • Organise sensitization and mobilization of the communities • Serve as focal point for information to be released to the press and public • Liaise with the different subcommittees, local leadership and NGOs involved in activities on mobilising communities
Psychosocial support	**Chair:** Psychosocial Coordinator Members (National/State/LGA levels): • Counsellors/Therapists • Mental Health clinicians • Clinical Psychologists • Technical assistants from the Ministry of Health • Nurses	• Provide psychological and social support to suspected/ • probable/confirmed cases; affected families and communities

Subcommittee	Members (experts, organizations)	Description of tasks
	• Social workers • Partners supporting psychosocial services	• Provide wellness care and psychological support to the response team • Prepare bereaved families/ communities for burials • Prepare communities for reintegration of convalescent cases/ patients who have recovered
Water, Sanitation and Hygiene (WASH)	**Chair**: Environmental Health Inspector or Water engineer (National/State/LGA levels): **Members:** • Environmental Health technician or WASH Officer • Ministry of Works and Housing • Health Inspectors • Technical assistants from the Ministry of Health (e.g Medical Laboratory scientist) • Partners supporting WASH e.g. UNICEF	• Conduct environmental health risk assessment for the outbreak • Ensure provision of clean water • Improve water management at household and community level • Plan for sanitation improvement campaign • Plan for improved hygiene practices including hand-washing, food hygiene and sanitation
8. Vaccination campaign	**Chair:** EPI focal point, (National/State/ LGA levels): **Members** • MCH supervisor • Clinician in charge • Director Disease Control, State Immunization Officers/ SIOs, Local Government Immunization Officers • Nurse in charge • PHC Coordinator/Medical Officer of Health • Reproductive and child health coordinators • Partners supporting vaccination (e.g. WHO, UNICEF) • Community leaders • Technical assistants from the Ministry of Health	• Identify high-risk groups during the outbreak that should be targeted for vaccination • Compute the targeted population for the vaccination campaign • Conduct micro-planning for all vaccination logistics including cold chain facilities, vaccine delivery and distribution, human resource needs, waste handling, social mobilization • Conduct the vaccination campaign and post vaccination campaign validation exercise • Monitor and report AEFI

5.4 Establish Public Health Emergency Rapid Response Teams at all Levels

A Public Health Emergency Rapid Response Team (PHERRT) is a technical, multidisciplinary team that is readily available for quick mobilization and deployment in case of emergencies to effectively investigate and respond to emergencies and public health events that present significant harm to humans, animals and environment irrespective of origin or source. PHERRT should be established at the LGA, State and national levels. For the composition of the PHERRT see chapter 4.

Roles and responsibilities of the national, State and LGA PHERRT

(a) Investigate rumours and reported outbreaks, verify diagnosis and other public health emergencies including laboratory testing

(b) collect additional samples from new patients and old ones if necessary (human, animals, food, and water)

(c) conduct follow-up by visiting and interviewing exposed individuals, establish a case definition and work with community to find additional cases

(d) assist in laying out mechanisms for implementing infection prevention and control measures

(e) assist in generating a line list of cases and conduct a descriptive analysis of data (person, place and time) to generate hypothesis, including planning for a further analytical study

(f) propose appropriate strategies and control measures including risk communications activities

(g) establish an appropriate and coordinated risk communication system through a trained spokesperson

(h) coordinate rapid response actions with national and local authorities, partners and other agencies

(i) initiate implementation of the proposed control measures including capacity-building

(j) conduct ongoing monitoring/evaluation of the effectiveness of control measures through continuous epidemiological analysis of the event

(k) conduct risk assessments to determine if the outbreak is a potential PHEIC

(l) prepare detailed investigation reports to share with PHEMC

(m) contribute to ongoing preparedness assessments and final evaluation of any outbreak response

(n) meet daily during outbreaks and quarterly when there is no outbreak

(o) participate in simulation exercises.

5.5 Risk Mapping for Outbreaks and Other Public Health Events

Vulnerability, risk assessment and mapping is used as an aid to preparedness to identify at-risk areas or populations, rank preparedness activities and engage with key policy and operational partners. This includes mapping and assessing risks (in the catchment area) with the potential to affect community health. Such mapping must address all acute health risks, and not be restricted to communicable diseases. The exercise should consider identification and mapping across all levels, from the national right down to the State and LGA. For example, include evaluation of drinking water sources or food storage methods and animal breeding areas and movements.

This process should be ongoing and updated periodically. For example, once a year, 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.

Nigeria adapted the WHO Strategic Tool for Assessing Risks (STAR), which is a tool used to assess a wide range of hazards including the health consequences of natural or human-induced emergencies, the health events covered under IHR (zoonosis, chemical, radio-nuclear and food safety) and also events occurring in neighbouring countries or States. The tool will assist the LGA or State or national level to formulate priorities for the development of contingency plans and specific responses, and also can be used to outline the potential needs to enhance national capacity in terms of preparedness and response (Strategic Tool for Assessing Risk, STAR, WHO, DRAFT Version 3.3.1 (2017/07/27). Countries may also use the 2008 Tripartite "Zoonotic Diseases: A Guide to Establishing Collaboration between Animal and Human Health Sectors at the Country Level", which is due to be updated and be a global document by the end of 2019 (https://www.oie.int/doc/ged/D12060.PDF).

5.6 Resource Mapping

In preparing for outbreaks, there is need to undertake resource mapping to identify the available resources in every geographical area. This ensures prompt mobilisation and distribution of such resources (both material and human) in an outbreak situation. Some of the resources can also be obtained from other sectors in the LGA or State or from development partners and NGOs at the respective levels.

5.7 Prepare an Emergency Preparedness and Response Plan

There should be all hazard plans developed for preparedness and response for national, State and LGA levels. The plans at all levels should be in line with the overarching national preparedness and response plan for the health sector and consistent with the overall national policies, plans and emergency management principles. The purpose of this plan is to build the ability of the national and subnational levels to respond promptly when an outbreak or other public health event is detected.

This plan should:

(a) be based on risk assessments conducted through a multisectoral approach and should specify the resources available for emergency preparedness and response

(b) take into consideration diseases with epidemic potential in the country, State, LGA, and neighbouring countries

(c) take into account all other events (all hazard approach) and cover the IHR (2005) core capacity requirements for surveillance and response (see Annex 1 A).

(d) take into account point-of-entry activities for strengthening surveillance and response

(e) lay out concept of operations (CONOPS) including clear lines of accountability, decision making authorities and processes, procedures for activation /deactivation, call for assistance etc.

(f) describe the surge capacity to respond to public health emergencies of national, State and LGA concern;

(g) provide estimates of the population at risk for epidemic-prone diseases and other public health emergencies

(h) clearly indicate for each suspected outbreak which reference laboratory will be used for confirmation

(i) provide estimates of needed quantities of medicines, vaccines, supplies, laboratory reagents, and consumables for each epidemic-prone disease likely to occur

(j) identify training needs and develop a training plan for all staff including Public Health Emergency Rapid Response Teams

(k) describe the procedures and plans to relocate or mobilize resources to support response

(l) describes the procedures for risk communication

(m) the plan should be tested before implementation and periodically through simulation exercises

The plan should also include how to institutionalize health facility and community resilience building and preventive interventions based on risk analysis and mapping.

Elements of Emergency Preparedness and Response Plan

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

1. designated coordination structures, including committees;
2. matrix of key stakeholders and partners supporting health activities [humans, animals (domestic, livestock and wildlife), environment, etc.] and roles and responsibilities;
3. epidemiology and surveillance activities, including health information management;
4. steps for carrying out a risk communication strategy including social mobilisation;
5. operational actions according to expected phases of the epidemic;
6. laboratory specimen collection, handling, transportation, processing and information management;

7. case management, including treatments (antiviral, antimicrobial, decontamination, disinfection or others as indicated), infection prevention and control, isolation facilities, management of a mass casualty event;
8. pre- and post-exposure prophylaxis treatment;
9. immunisation strategies;
10. rapid containment activities and additional methods if rapid containment fails;
11. psychosocial support for all affected, including community members and responders;
12. risk communication and social mobilisation;
13. capacity-building including required training, sensitization meetings and simulation;
14. logistics including supply lists;
15. environment, water and sanitation;
16. decontamination of patients and environment, including management of dead bodies;
17. monitoring of the outbreak or event;
18. resource mobilisation and procedures to relocate or mobilize resources to support response.

5.7.1 Set up Contingency Stocks of Medicines, Vaccines, Reagents and Supplies

Outbreaks and other public health emergencies require the rapid mobilisation of resources such as vaccines, medicines and lab supplies. It is prudent to map out resources available so as to get the status of the stockpile with respect to pharmaceuticals, personal protective equipment (PPE) and other equipment to establish and preposition stockpiles of materials before an emergency occurs. While doing the mapping at national level for stockpiling, it is also important to know the African region and global stockpiles of various items which may be used during an outbreak.

As follow-up to the public health risk assessment activity, each level from LGAs to national should set up a contingency stock of medicines, vaccines, reagents and supplies to ensure prompt management of the cases. For the subnational level, this is critical before support arrives from higher levels. Ensure that, there are also quick mechanisms for sending supplies from the central level. Also, regularly and carefully monitor the contingency stock in order to avoid shortages and expiry of medicines, vaccines, reagents and supplies. Examples of stock management tools are included in the annexes 5A, 5B and 5C. The content of the contingency stock varies with the nature of epidemic-prone diseases and the risk of outbreak in the LGA. Risk assessment activities help to develop a list of minimum materials that should be stockpiled at the LGA and community levels. If all LGAs and community levels cannot be stockpiled with minimum materials, ensure that a designated point (health centre, LGA) is identified to ensure the quick release of these items when needed during an outbreak.

Partnerships with other implementing agencies such as NGOs, concerning stockpiles of appropriate medicines and vaccines and other materials, should be established in advance at all levels (national, State and LGA).

A suggested list of contingency medicines and supplies is available in Annex 5A.

5.7.2 Conduct Stock Management for Outbreak Response

Maintain and preposition a sufficient stock of supplies and materials for responding to an outbreak or public health event before an outbreak occurs. These supplies should be stored in safe and adequate conditions as required.

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, they can be purchased or requested through the national procurement system.

Periodically (e.g., every 4 months) make sure the supplies are dry, clean, not expired, not deteriorated and ready for use and that the mechanisms to access them are available.

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

(a) List all items needed to conduct surveillance, laboratory activities and response; items necessary for detecting and responding to priority diseases, conditions and events. Consider the availability of:

  (i) case definition posters, registers, including the line list, and the required reporting forms/referral forms
  (ii) laboratory reagents and supplies as well as diagnostic reagents and kits
  (iii) Specimen collection, storage and transport kits including triple package containers,
  (iv) various surveillance and response guidelines for specific diseases as well as laboratory SOPs
  (v) case management guidelines, medicines, supplies and other field intervention materials
  (vi) Case Investigation Forms (CIFs)

(b) Make an inventory and note the quantity of each item that is available.

(c) Complete and regularly update a stock balance sheet for each item.

(d) Observe expiry dates and practice best logistical practices for packing, shipping, storing and disposing of supplies and materials

(e) 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 establishing minimum quantities

(f) Monitor the stock balances against the critical quantity established

(g) Report regularly on the IDSR stock situation. See Annex 5C for an example of a stock item

transaction and balance sheet.

5.7.3 Update the Human Resources Available for Response as Well as Other Logistical Support for Response to Public Health Events at All Levels

(a) Update yearly list of all surveillance focal persons from all reporting sites including community level.

(b) Update roster of Public Health Emergency Rapid Response Teams

(c) Take inventory and update the list of other logistics like vehicles, phone cards etc.

(d) Update list of trained health staff

(e) Map laboratories that have sufficient quality control standards and meet the required standards to ensure reliable results, including availability of SOP which defines biosafety procedures for collecting, packaging, labelling, shipping, processing and discarding samples. Map also the specimen referral/transportation network including schedules; and where such networks are non-existent, create the mechanism to ensure prompt referral of specimens once an outbreak is suspected

(f) Map and update isolation wards for the management of patients with highly infectious diseases including contact details, location, bed capacity, level of expertise, and type of patients/diseases that can be treated

(g) Develop a patient referral system for highly infectious diseases, including transportation mechanisms

(h) Take stock of risk communication SOPs at the different levels

5.8 Annexes to Chapter 5

Annex 5A Essential stock items for responding to outbreaks

Annex 5B Stock situation report

Annex 5C IDSR stock item transaction and balance sheet

Annex 5D Assignments for the committee to develop the Epidemic Preparedness and Response plan

Please refer to http://ncdc.gov.ng/idsr_forms for samples of these forms

Annex 5A: Essential Stock Items for Responding to Outbreaks

Essential Stock items for Responding to Outbreaks				
Medicines	**Disinfectants, insecticides and rodenticides**	**Supplies**	**Vaccines**	**Equipment**
Ceftriaxone	**Disinfectants**	Auto-disable syringes	Meningitis vaccines AC, ACW135/ A, C, Y, W135, Meningococcal Conjugate Vaccine (MACV), Meningitis vaccines Conjugated	PPE
			Cholera vaccines	Body Bags
Ciprofloxacin	2% Chlorine		Tetanus antitoxin	Buckets
Diazepam	Bleach	Bed nets	Yellow fever vaccines	Camping kits
Doxycycline	Calcium hypochlorite	Personal Protective Equipment (See Annex 4C)	Rabies vaccine and immunoglobulin	Candles
Medicines for supportive care	Cresol	Laboratory supplies (See Annex 4B)	Other vaccines e.g. Flu vaccine	Computer
Erythromycin	Sodium hypochlorite			Containers
	Pesticides	Nasogastric tubes 2.7 mm OD, 38 cm		Cook-ware
	Cypermethrin	Nasogastric tubes 5.3 mm OD, 50 cm		Diesel
Oral rehydration salts	Malathion	Needles and syringes		Front lamp
Paracetamol	Permethrin	Intravenous giving sets different sizes)		GPS Receiver
Penicillin V	Rodenticides	Spoons		Kerosene lamp
Rehydration fluids:	Brodifacom	Sprayers		Lab: See Annex 4b
Ribavirin	Bromadione			Lamps
Ringer lactate				Maps
Oseltamivir				Kerosene
				Phones
				Plastic sheets
				Power generator
				Radio
				Sprayers

NB: Detailed list also available in Annex 4B

Surveillance and Emergency Preparedness and Response: Stock Situation Report
Year:
Report day (day/mm/yyyy): Reporting period:
Reporting site name:
LGA: **Province:** **Country:**

Annex 5B: Stock Situation Report

Item Description	Opening Stock	Quantity received	Total Stock	Quantity issued	Stock Balance	Observations, decisions and recommendations

Annex 5C: IDSR Stock Item Transaction and Balance Sheet

IDSR Stock Item Transaction and Balance Sheet

Laboratory or Warehouse Name	Item Description (Name)	Presentation (Unit of Purchase)	Expiry Date	Manufacturer	Batch number	Location in store	Airway bill	Allotment number	Shipment and Operational Cost	Transaction Day/Month/year	Quantity received	Donor Supplied	Quantity Issued	Destination or Beneficiary	Stock Balance		Signature (Name and Function)	Observation/Remarks
															0			Inventory

Use one sheet by stock item, and update the sheet every time any transaction takes place

IDSR Stock Item Transaction and Balance Sheet

Laboratory or Warehouse Name	Item Description (Name)	Presentation (Unit of Purchase)	Expiry Date	Manufacturer	Batch number	Location in store	Airway bill	Allotment number	Shipment and Operational Cost	Transaction Day/Month/year	Quantity received	Donor Supplied	Quantity Issued	Destination or Beneficiary	Stock Balance		Signature (Name and Function)	Observation/Remarks
															0			Inventory

Use one sheet by stock item, and update the sheet every time any transaction takes place

Annex 5D: Assignments for the Committee to Develop the EPR Plan

Task	Assigned member(s) from the committee
Designated coordination structures, including committees	
Organisational framework of key stakeholders and partners supporting health activities (human, animal, environment, etc.) and roles and responsibilities	
Epidemiology and surveillance activities, including health information management	
Define roles and responsibilities of members during an outbreak	
Develop the risk mapping	
Steps for carrying out a risk communication strategy including social mobilization	
Operational actions according to expected phases of the epidemic	
Laboratory specimen collection, handling, transportation, processing and information management	
Case management, including treatments (antiviral, antimicrobial, decontamination, disinfection or others as indicated), infection control, isolation facilities, management of a mass casualty event	
Pre- and post-exposure prophylaxis treatment	
Immunization strategies	
Rapid containment activities and additional methods if rapid containment fails	
Psychosocial support for all affected, including community members and responders	
Risk communication and social mobilisation	
Capacity-building including required training, sensitisation meetings and simulation	
Logistics including supply lists	
Environment, water and sanitation	
Decontamination of patients and environment, including management of dead bodies	
Monitoring of the outbreak or event	
Resource mobilisation and procedures to relocate or mobilize resources to support response	

5.9 References

1. Geneva: World Health Organization; 2012 (WHO/HSE/GAR/ARO/2012.1; http://whqlibdoc.who.int/hq/2012/WHO_HSE_GAR_ARO_2012.1_eng.pdf, accessed June 2017).

2. Operational guidance on rapid risk assessment methodology. Stockholm: ECDC; 2011 (http://ecdc.europa.eu/en/publications/Publications/1108_TED_Risk_Assessment_Method ology_Guidance.pdf, accessed June 2017).

3. Standard Operating Procedures for AFRO Strategic Health

Operations Centre (AFRO SHOC). Disease Surveillance and Response Programme Area. Disease Prevention and Control Cluster, December 2014

4. WHO African State strategy for health security and emergencies 2016–2020

6.0 Overview on How to Respond to Outbreaks and Other Public Health Events

The goal of integrated disease surveillance and response is to use data for public health response or action. This section describes steps for declaring an outbreak and activating the response structures, conducting a public health response and providing general directions for immediate response actions targeting the leading causes of illness, death and disability. Refer to annex 6 for the response to chemical, biological and radio-nuclear events.

When an outbreak, acute public health event or condition is detected, an investigation should be conducted to determine its cause as described in chapter 4. The results of the investigation should guide the response. Most disease prevention and control programmes implement successful response actions such as conducting a mass immunisation campaign for a vaccine-preventable disease, strengthening nutritional support and feeding practices for children with malnutrition or administering antimalarial, antibiotic or antiviral treatments as indicated. Successful responses are carried out with community involvement and often include a community education and behaviour change component.

Effective coordination of response activities is also critical, as many actors/stakeholders will be involved. It is essential that all actors/stakeholders be identified in advance, including their areas of support, roles and responsibilities to enable smooth response during an epidemic or any other public health event. This is the role of the PHEMC which through activation of the PHEOC will ensure the effective coordination of response activities across different sectors and donors (refer to Section 5).

Regardless of the specific recommended response, the national, state or LGA's role in selecting and implementing a recommended response is essential for safeguarding the health and well-being of communities at the respective levels.

Under the IHR (2005), LGAs are required to be involved in response to hazards such as infectious diseases, zoonosis, food safety, chemical, radio-nuclear and other unknown events if they are detected.

6.1 Declaring an Outbreak and Activating the Response Structures

Once an epidemic threshold is reached at LGA level, the LGA DSNO should notify the State and subsequently the national level (NCDC). Depending on the event, at the national level, the IHR NFP (NCDC) will assess whether the event is a potential PHEIC using the IHR decision instrument. The NFP notifies the WHO IHR contact point (WHO AFRO Office). They will then alert the States and neighbouring countries where applicable about the outbreak to ensure coordination of response efforts. While waiting for laboratory confirmation, there may be a declaration of an outbreak by the Minister of Health or the competent sector ministry.

6.2 Mobilise Public Health Emergency Rapid Response Teams (PHERRT) for Immediate Action

The Public Health Emergency Rapid Response Teams (PHERRT) would have already been identified during preparedness activities. Mobilize the teams and make sure that their membership reflects the technical needs of the response. Refer to Chapter 5 of these guidelines for recommendations on the composition as well as the roles and responsibilities of the rapid response teams.

6.2.1 Convene the LGA Public Health Emergency Management Committee (PHEMC)

Once an outbreak or event is confirmed, the LGA Health Management Team (HMT) shouldl work with the LGA Chairman to convene the PHEMC to assess and implement the response. They should also activate the IMS (see chapter 5). The following further steps should be taken:

(a) Request the release of outbreak or event response funds.

(b) Alert neighbouring LGAs within and outside the State about the outbreak. If they are reporting a similar outbreak, coordinate response efforts with them. Where two or more countries are involved, if there is an already established cross-border surveillance and response framework with a neighbouring country, then inform the neighbouring LGA in that country. If not, the IHR NFP must communicate with the neighbouring NFP to notify them of the public health event. This will facilitate coordination of the response to the public health event and curb the spread of the disease beyond the catchment area.

(c) Assign clear responsibilities for specific response activities to lead the technical committee. They will also review the IMS team to ensure that it is adequately composed; i.e., has all the technical and non-technical members (See chapter 5).

(d) Provide orientation or training along with an adequate stock of relevant supplies for the LGA response team and affected health facility staff.

(e) Review existing resources as defined in the preparedness plan and determine what additional resources are required.

For example, consider:

(i) the human resources that could be mobilized to manage the epidemic

(ii) funds to support response activities

(iii) other logistics support; e.g., vehicles, fuel and phones

(f) Request emergency stocks or personal protective equipment (PPE), disinfectants, required medicines and other medical supplies such as specimen transport kits.

(g) Provide laboratory or diagnostic support for confirmation of pathogens responsible for the epidemics. If the LGA does not have the capacity to safely collect, package and transport the specimen, contact the reference laboratory for assistance. For laboratories where referral of specimen is a challenge, consider using rapid diagnostic kits or any other point-of-care (PoC) diagnostics, if available.

(h) Mobilise logistic support (travel of rapid response team, accommodation arrangements, communication, other essential equipment) for the LGA and community levels.

(i) If supplies are not available locally:

(i) contact the State or national level to request alternate supplies

(ii) collaborate with other services, activities or nongovernmental organisations or private pharmacies/laboratories in your area

(iii) Identify practical low-cost substitutes

(j) Ensure clear lines of communication and appoint a spokesperson

6.3 Select and Implement Appropriate Public Health Response Activities

Review investigation results and data analysis interpretation provided by PHERRT to select appropriate response activities that would contain the confirmed outbreak or public health event. Regardless of the specific causes of the outbreak or event, the success of the response depends on activation of the IMS and implementation of intervention strategies such as:

(a) overall coordination
(b) case management as well as infection, prevention and control (IPC)
(c) logistics and supply chain management
(d) laboratory or diagnostics
(e) surveillance and epidemiology
(f) social mobilisation and risk communication
(g) reactive vaccination
(h) water, sanitation and hygiene (WASH)
(i) vector control and environmental sanitation

Refer to chapter 11 for national disease-specific guidelines to select response activities, which involve:

(a) proven measures to prevent unnecessary deaths or disabilities due to the specific cause of the problem
(b) a mix of activities for immediate control of the problem in the short-term and reduction of the risk of ongoing transmission in the long-term through prevention activities
(c) participation from the community, health care facilities and the LGA personnel
(d) participation of other key stakeholders from private organizations, business entities, traditional healers, food vendor associations and others who might influence the response activities

Response activities for particular outbreaks or public health problems or events may include the following:

(a) perform case management
(b) conduct emergency vaccination campaigns, when recommended for humans or animals

(c) provide relevant chemoprophylaxis and vaccination for health workers
(d) improve access to clean water
(e) improve safe disposal of human and animal waste including safe burial practices
(f) improve food-handling practices
(g) reduce exposure to mosquitoes and other vectors
(h) vectors control measures
(i) involve other experts (socio anthropologist, social scientist)
(j) enhance specific surveillance measures at points of entry
(k) enhance social mobilisation and behavioural change activities
(l) strengthen media and public communication (press, radio, TV, social media, etc.).

Implementing a response means executing the operational steps so that the actions are carried out as planned. Regardless of the specific causes of the outbreak or event, the success of the response depends on the success of general factors such as management (treatment and monitoring of patients for adverse events particularly if experimental medicines or vaccines are used) and appropriate IPC, provision of supplies and availability of trained health staff.

The selected activities for responding to outbreaks or public health events include the following:

(a) strengthen case management and infection prevention and control measures
(b) build the capacity of response staff
(c) enhance surveillance during the response
(d) enhance surveillance in neighbouring border LGA
(e) engage the community during the response
(f) inform and educate the community
(g) conduct a mass vaccination campaign
(h) improve access to clean and safe water
(i) ensure safe disposal of infectious waste
(j) improve food-handling practices
(k) reduce exposure to infectious or environmental hazards

(l) ensure safe and dignified burial and handling of dead bodies

(m) ensure appropriate and adequate logistics and supplies.

(n) Non pharmaceutical interventions such as restriction of movement and social distancing

6.3.1 Strengthen Case Management and Infection Prevention and Control (IPC) Measures

Take steps to support improved clinical practices in the LGA. Review the recommendations in Annex 6A and chapter 11 for treating cases of different diseases during an outbreak.

(a) Train and equip health workers at the LGA level to implement these measures.

(b) Ensure that clinicians receive laboratory confirmation results where necessary.

(c) Ensure that health workers record all patients in a recognisable standardised register and a line list.

(d) Ask the officer-in-charge at each health facility to identify an area that can be used to accommodate a large number of patients during epidemics involving a large number of cases.

(e) Provide standard operating procedures (SOPs) that include IPC guidelines.

(f) Implement IPC and risk mitigation measures such as:

i. establish triage and isolation wards for highly infectious diseases (Lassa Fever, cholera and Ebola SARS, etc.). See Annex 6H for VHF treatment centre

ii. ensure that health workers have access to safety and personal protective equipment for any infectious diseases (especially for Lassa Fever and Ebola)

iii. ensure that there are safe practices and protection of non-health workers (supporting staff, e.g. security, cleaners, administrative staff)

iv. assess and ensure WASH standards for health facilities

v. provide oversight about disposal of PPE and other contaminated supplies

vi. ensure appropriate biosafety and biosecurity for animals (farms, markets, etc.).
vii. ensure that the necessary medicines and treatment supplies are available
viii. ensure that the proper treatment protocols are available and adhered to
ix. review the standard operating procedures for the referral system
x. ensure that a proper discharge protocol of cases linked to social workers is available.

6.3.2 Build the Capacity of Response Staff

Provide relevant capacity-building opportunities for response staff on the outbreak or event case definition, case management procedures, reporting process and required data elements. It is essential that members of the PHERRT are aware of and have access to any indicated PPE and IPC practices relevant for the disease targeted by the response. If there are immunisation requirements for responding to the particular disease or condition, ensure that members of PHERRT are protected with the required vaccines.

To reinforce the skills of response staff:

(a) Give clear and concise directions to health workers and other staff participating in the response.
(b) Select topics for orientation or training. Emphasise case management and IPC 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:
    i case management protocols for cases
    ii enhancing standard precautions (use of clean water, hand-washing and safe disposal of sharps)
    iii barrier nursing and use of protective clothing
    iv isolation precautions
    v treatment protocols such as delivering oral rehydration salts (ORS) and using intravenous fluids

vi disinfecting surfaces, clothing and equipment
vii safe disposal of bodies and dignified burials
viii safe disposal of animal carcasses
ix others which may seem necessary and may include client-patient interactions and counselling skills, orientation on how health worker would interact with CBS focal persons etc.

(c) Conduct orientation and training
i. Orient or reorient the LGA PHEMC, PHERRT and other health and non-health personnel on epidemic management based on the current epidemic
ii. In an urgent situation, there often is not time for formal training. Provide on-the job training as needed. Make sure there is an opportunity for the training physician or nursing staff to observe the trainees using the updated or new skill
iii. Monitor participant performance and review skills as needed

6.3.3 Enhance Surveillance During the Response

During a response to an outbreak, healthcare workers at all health facilities must be vigilant in surveillance of the disease, condition or events, by liaising with the community health worker or any person identified as community focal person. For example, members of the response teams and health staff in affected facilities should:

(a) 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, ensuring that they have access to consistent/adequate food, water, and non-food items (i.e. soap, chlorine, firewood, medicines, sanitary pads, etc.)
(b) ensure timely provision of laboratory information to the team
(c) update the line list, make data analysis by time (epi curve), person (age and sex) and place (mapping of cases)
(d) monitor the effectiveness of the outbreak response activity
(e) report daily at the beginning of the epidemic; once the epidemic progresses, the LGA PHEMC can decide on a different frequency of reporting

(f) actively trace and follow up contacts as indicated (See chapter 4 for how to do contact tracing)

6.3.4 Enhance Surveillance With Neighbouring (Border) LGAs

During response, it is important also to work closely with neighbouring LGAs to ensure that the outbreak does not spill to another LGA. It is important to share information and also plan for joint surveillance and response activities.

Initiate the establishment of the cross-border disease surveillance and response committees to provide a platform for sharing surveillance data, epidemiological and other related information during the outbreak. The committee should have members from both neighbouring LGAs and its composition should include at least:

(a) the DSNO responsible for IDSR

(b) the laboratory focal person

(c) the medical officer of health/PHC coordinator

(d) the focal person responsible for environmental health

(e) CHO/CHEW

(f) the area veterinary officers, immigration officers (in border LGA) and the LGA chairman.

(g) Point of entry team {port health services (PHS), Nigeria Agricultural quarantine service (NAQs), Customer service, immigration service, etc.} as applicable.

The committee can also coopt other members depending on the disease profile and the disease outbreak/public health emergency being handled.

The committee will meet as soon as a public health emergency is identified and then weekly or fortnightly as it continues. It will continue to hold routine quarterly meetings during the inter-epidemic period to review disease trends, other early warning systems and its LGA's level of preparedness.

6.3.5 Engage Community During Response

Community-based surveillance focal persons (See definition in the Introduction section) can be the first responders and take steps to make the situation as safe as possible for the community. Some of the actions include the following:

(a) Engage and inform community leaders with information on the situation and actions that can be taken to mitigate the situation

(b) Provide first aid and call or send for medical help

(c) Keep people away from a 'risk' area (potentially contaminated water source)

(d) Respectfully isolate anyone with a potentially infectious disease paying particular attention to cultural sensitivities

(e) Quarantine for animals, market closures, etc.

(f) Provide community education including specific actions the community can take to protect themselves.

(g) Engage in IPC and hygiene promotion in coordination with any efforts at strengthening the availability of materials/infrastructure for IPC and hygiene.

(h) Identify local effective channels for delivery of the information to the community

(i) Organise door-to-door campaigns using trusted individuals to reach every household within the catchment area in order to curb the spread of the public health event and to encourage self-reporting, appropriate health-seeking behaviour among people who have had contact with the public health event or are suspected to be public health event cases and compliance with response protocols.

(j) Engage community members as stakeholders and problem solvers, not merely beneficiaries.

6.3.6 Inform and Educate the Community

Effective risk communication is an essential element of managing public health events. It is a crosscutting activity that can impact other technical areas of the response such as WASH, vaccination, community surveillance, etc. It is also essential to create trust between first responders and the community. 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 response efforts. Develop community education messages with information about recognising 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. Identify community groups or local NGO or outreach teams that can help gather information and amplify the messages. Ensure consistency in content of messaging between all messengers (community leaders, health care personnel, religious leaders, etc.).

The following should be considered for effective risk communication:

(a) Decide what to communicate by referring to disease-specific recommendations in chapter 11. Make sure to include:
    (i) signs and symptoms of the disease
    (ii) how to treat the disease at home, if home treatment is recommended and how to prepare disinfectant solutions
    (iii) prevention behaviours that are feasible and that have a high likelihood of preventing disease transmission
    (iv) when to come to the health facility for evaluation and treatment, immunisation recommendations, if any

At the same time, maintain active processes for collecting qualitative information needed to establish and address any circulating rumours.

(b) Decide how to state the message. Make sure that the messages:
    (i) use local terminology

(ii) are culturally sensitive and acceptable
(iii) are clear and concise
(iv) consider local traditions
(v) address beliefs about the disease.

Consider pre-testing the messages from similar settings before dissemination. Sample community education messages are found in Annex 6F.

(c) Select the appropriate communication methods available in your LGA. For example:
   (i) mass media, (radio, television, newspapers)
   (ii) meetings (health personnel, community, religious, opinion and political leaders)
   (iii) educational and communication materials (posters, fliers)
   (iv) multimedia presentations (e.g., films, video or narrated slide presentations) at the markets, health centres, schools, women's and other community groups, service organizations, religious centres
   (v) social media (Facebook, Twitter, WhatsApp, etc.)
   (vi) community drama groups/play groups
   (vii) public address system
   (viii) corporate/ institutional website
   (ix) e-mail/ SMS subscriptions.

(d) Give health education messages to community groups and service organisations and ask that they disseminate them during their meetings

(e) Give health education messages to trusted and respected community leaders and ask them to transmit to the community
   (i) Designated person from the MoH should serve as spokesperson to the media. Tell the media the name of the spokesperson, and that all information about the outbreak will be provided by the spokesperson

(ii) Release information to the media only through the spokesperson to make sure that the community receives clear and consistent information

(f) On a regular basis, LGA and State medical officers will meet with local leaders to give:

(i) frequent, up-to-date information on the outbreak and response

(ii) clear and simple health messages for the media

(iii) Engage media stakeholders and give clear instructions to communicate to the media, the information and health education messages from the PHEMC.

6.3.7 Conduct a Mass Vaccination Campaign

Collaborate with the National Primary Health Care Development Agency (NPHCDA) to conduct a mass vaccination campaign, if indicated. Develop or update a micro-plan for the mass vaccination campaign as soon as possible. Speed is essential in an emergency vaccination because time is needed to obtain and distribute vaccines.

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

Refer to Annexes 6C and 6D for "Planning a mass vaccination campaign" and "Estimating vaccine supplies for vaccination activities" respectively. Refer to Annex 6E for recommended vaccination practices for vaccination campaigns.

6.3.8 Improve Access to Safe Water

Containers that hold drinking water can be the vehicle for disease outbreaks including cholera, typhoid, shigella and hepatitis A and E. Make sure the community has an adequate supply of clean and safe water for drinking and other uses. The daily water needs per person during non-outbreak situations are presented on Table 6.1. Water needs are much higher during an outbreak situation, especially outbreaks of diarrhoeal diseases.

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

Table 6.1: Basic Water Quantity Needs

**Refugee Health: An Approach to Emergency Situations, Médecins sans Frontières, 1997 MacMillan

Safe drinking water includes:

(a) piped chlorinated water

(b) safe drinking water obtained through chlorination at point-of-use

(c) water obtained from protected sources (such as wells closed with a cover, rainwater collected in a clean container)

(d) boiled water

If no local safe water sources are available during an emergency, water may need to be brought from outside. To ensure that families have safe and clean drinking water at home (even if the source is safe) do the following:

(a) provide community education on how to keep home drinking water safe. Refer to Annex 6F for sample community messages and references to specific prevention guidelines for preparing safe water at home

(b) provide containers that prevent water contamination. For example, containers with narrow openings are ideal because users would not be able to contaminate the water by putting their hands into the container

(c) ensure that waste disposal sites, including for faeces, are located at least 30 metres away from water sources

6.3.9 Ensure Safe Disposal of Infectious Waste

To ensure the safe disposal of human excreta in order to avoid secondary infections due to contact with contaminated substances:

(a) assign teams to inspect local areas for human and animal waste disposal. Safe practices include disposing of faeces in a latrine or burying them in the ground more than 10 metres from water supply

(b) if unsafe practices are found such as open defecation, educate the community on safe disposal of such waste. Construct latrines appropriate for local conditions with the cooperation of the community

(c) conduct effective community education on sanitation practices

6.3.10 Improve Food-Handling Practices

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

To ensure food hygiene:

(a) conduct community education on food hygiene practices for the general public and those in the food industry

(b) visit restaurants, food vendors, food packaging factories and other venues to inspect food handling practices, focusing on safe practices such as proper handwashing, cleanliness and adherence to national standards

(c) close restaurants, vending areas or factories if inspection results show unsafe food handling practices

(d) strengthen national controls for food safety as necessary.

6.3.11 Reduce Exposure to Infectious or 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 (e.g., lead) will require coordination with multiple ministries and partners. Community

education and behaviour change interventions can help the community to effect 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 implicated vectors (e.g., Anopheles mosquito). Work with the malaria control program in your LGA to:

(a) promote indoor residual spraying
(b) conduct community education on the proper use of bed nets and the avoidance of dusk-to-dawn mosquito bites
(c) promote the use of available insecticide-treated materials (long lasting insecticides treated nets, blankets, clothes, sheets, curtains, paints, etc.)
(d) encourage environmental cleanliness (e.g., draining stagnant water, clearing bushes etc.).

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

(a) avoid contact with rodents and their urine, droppings and other secretions
(b) keep food and water in the home covered to prevent contamination by rodents
(c) keep the home and cooking area clean and tidy to reduce the possibility of rodents nesting in the room
(d) use chemicals (insecticides, rodenticides, larvicides etc.) and traps as appropriate based on environmental and entomological assessment
(e) educate the community on personal protection to reduce exposure.

6.3.12 Ensure the Safe and Dignified Handling and Burial of Dead Bodies

Dead body management is crucial in combating the spread of infectious diseases both in case detection and surveillance as well as in the management of potentially infectious material. VHF, cholera and unexplained deaths in suspicious circumstances are situations that require the careful handling of bodies. It is also essential to ensure the safe and dignified disposal of bodies by trained personnel, given the infectious nature of epidemic-prone diseases. The disinfection or decontamination of homes and hospital wards (where people have died of an infectious disease) should be implemented.

A guide should be prepared on the proper disinfection or decontamination of homes and hospitals where there have been corpses of persons who died from a suspected infectious disease.

Safe and dignified burial SOPs in the IPC guidelines currently distinguish between high and low priority/risk bodies and rely on trained teams. Deaths that are considered high-risk may be treated as a form of surveillance and case detection for VHF or possibly other conditions when relevant testing capabilities are available.

Safe burials can be conducted in the community at approved burial sites at the discretion of the families. The PHEMC may be directed to develop a safe and dignified burial contingency plan when an infectious disease outbreak occurs, and such plan will be reviewed periodically to adapt to the evolution of the epidemic.

6.3.13 Ensure Appropriate and Adequate Logistics and Supplies

A dedicated logistic team is needed during an outbreak response.

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 (e.g., additional airtime top-up for mobile phones), take action to provide teams what they need to carry out the response actions.

Monitoring the management of the outbreak or event is crucial to outbreak

control. The monitoring results are important for they will be included in the response report submitted to the supervisory levels and to community leaders and needed for future advocacy.

For example, make sure there is ongoing monitoring of:

(a) disease trends to assess the effectiveness of the response measures, the scope of the epidemic and risk factors

(b) the effectiveness of the response: case fatality rate, incidence/attack rate

(c) implementation of the response: meetings of the incident management team in the PHEOC

(d) availability and use of adequate resources, supplies and equipment

(e) community acceptability of response efforts

(f) regular reporting on stocks levels provided during emergencies.

6.4 Provide Regular Situation Reports on the Outbreak and Events

Periodically, report on the progress of the outbreak response (See Annex 6G). Provide information developed by the PHEOC to the affected communities and health facilities. In the situation updates, provide information such as:

(a) details on response activities, including dates, places and individuals involved in each activity, as well as the "Epi" curve, spot map, table of person analyses, and the line list of cases

(b) any changes made since the last report

(c) effectiveness of the response: case fatality rate, incidence/attack rate

(d) implementation of the response of the PHEMC etc.

(e) operational challenges and gaps

(f) recommended changes to improve future epidemic response such as a vaccination strategy to enhance immunization or a transportation procedure to ensure that specimens reach the reference laboratory quickly and in good condition.

The situation reports will be an important reference for evaluating the response and developing a final report. Refer to Annex 7A for a suggested format of the report. Steps for monitoring and evaluating a response are presented in chapter 8.

6.5 Document the Response

During and at the end of an outbreak, the LGA health management team should:

(a) collect all the documents including minutes of any meeting, activity or process, epidemic reports, evaluation reports, and other relevant documents

(b) prepare a coversheet listing of all the above documents

(c) document lessons learnt and recommended improvements and accordingly update the country EPR plan, event/disease-specific plan and other relevant SOPs and tools, where appropriate (After-Action Review — AAR).

This will become an essential source of data for evaluating the response. See chapter 8, on how to monitor, evaluate, supervise and provide feedback on IDSR activities.

6.6 Annexes to Chapter 6

Annex 6A Treating cases during an outbreak

Annex 6B Preparing disinfectant solutions from ordinary household products

Annex 6C Planning an emergency immunisation campaign

Annex 6D Estimating vaccine supplies for immunisation activities

Annex 6E Recommended immunisation practices

Annex 6F Sample messages for community education

- Handwashing
- Safe handling of food
- Safe disposal of human waste
- Clean drinking water and storage
- Safe burial of bodies
- Reducing exposure to mosquitoes
- Response to chemical and radio-nuclear events

Annex 6A: Treating Cases During an Outbreak

Use appropriate medicines and treatments for managing cases during an outbreak. Below are treatment recommendations for use in an outbreak situation for:

(a) cholera
(b) Lassa fever
(c) measles
(d) bacterial meningitis

For detailed treatment guidelines of these and other diseases of priority concern, please refer to the specific disease guidelines.

1. Treating Cholera in an Outbreak Situation

Source: WHO guidelines for management of the patient with cholera, WHO/CDD/SER/91.15 and The New Emergency Health Kit 98, WHO/DAP/98.10 AND NCDC Cholera guideline for case management

(a) Assess the patient for signs of dehydration. see assessment guide below.
(b) Give fluids according to the appropriate treatment plan (see next page).
(c) Collect a stool specimen from the first five suspected cholera patients seen.
(d) 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, restless and irritable or unconscious?	
• Are the patient's eyes sunken?	
• Offer the patient fluid. Is the patient: not able to drink, or drinking poorly, drinking eagerly, thirsty?	
• Pinch the skin of the abdomen. Does it go back very slowly (longer than 2 seconds?) or slowly?	
Decide if the patient has severe, some, or no signs of dehydration, and give extra fluid according to the treatment plan	
SEVERE DEHYDRATION*	
PLAN C	If two of the following signs are present:
GIVE IV FLUID FOR SEVERE DEHYDRATION	• not able to drink or drinking poorly • skin pinch goes back very slowly • lethargic or unconscious • sunken eyes

*In adults and children older than 5 years, other signs for severe dehydration are "absent radial pulse" and "low blood pressure".

SOME DEHYDRATION

If two of the following signs are present:

- skin pinch goes back very slowly
- lethargic or unconscious
- restless and irritable
- sunken eyes
- drinks eagerly, thirsty
- skin pinch goes back slowly

PLAN A

NO DEHYDRATION

If there are not enough signs to classify as some or severe dehydration

Give fluid and food to treat diarrhoea at home.

Plan C: Intravenous Therapy for Severe Dehydration

(a) Severe dehydration is a medical emergency and patients must be treated urgently. Seconds can make a difference.

(b) Patients with severe dehydration should start intravenous fluids (IV) immediately.

(c) As soon as the patient can drink, also give ORS solution 5ml/kg/hour simultaneously.

(d) Ringer's lactate is the first choice out of all the IV fluids. If Ringer's lactate is not available other sterile solutions can be an alternative:

(i) normal saline;

(ii) 5% glucose in normal saline;

(iii) cholera saline (containing Na+, 133; K+, 20; Cl-, 98; acetate, 48 mmol/L).

(e) Plain 5% glucose (dextrose) solution is not recommended.

(f) Give a total of 100 ml/kg Ringer's Lactate Solution divided into two periods as indicate below:

Age	First period	Second period	Total
< 1 year	30 ml/kg in 1 hour	70ml/kg in 5 hours	100 ml/kg in 6 hours
≥ 1 year and adults	30 ml/kg in 30 min	70 ml/kg in 2 $^{1/2}$ hours	100 ml/kg in 3 hours

(a) More than one IV line may be necessary to give the first bolus treatment.

(b) When IV rehydration is not possible and the patient can't drink, ORS solution can be given by nasogastric tube.

- Do not use nasogastric tubes for patients who are unconscious or vomiting.

(c) When possible, fluid output should be measured and equivalent volumes added to the amount described for initial treatment.

(d) Monitor the patient closely and perform frequent reassessment (every 15-30 min).

(e) If hydration is not improving, give the IV drip more rapidly. 200ml/kg or more may be needed during the first 24 hours of treatment.

(f) After 6 hours (infants) or 3 hours (older patients), perform a full reassessment. Switch to ORS solution if hydration is improved and the patient can drink.

Complications – pulmonary oedema can occur if excessive IV fluid has been given; renal failure if too little IV fluid is given; and hypoglycaemia and hypokalaemia in children with malnutrition rehydrated with Ringer lactate only. Rehydration must be closely monitored by the medical staff.

Antibiotic Treatment

(g) The laboratory should be asked about patterns of resistance of the strain at the beginning of and during the outbreak and adapt the treatment accordingly.

(h) Antibiotics should be given only in severe cases, to reduce the duration of symptoms and carriage of the pathogen.

(i) Antibiotics are given as soon as the patient is able to take oral medication (once vomiting has stopped):

(i) Doxycycline: single dose (300mg for adults; 2-4 mg/kg for a child between 1 and 14 years of age), is antibiotic of choice for all patients, including pregnant women.

(ii) If there is resistance to doxycycline, use azithromycin (1 g orally as a single dose for adults and 20 mg/kg (max 1g)) orally as a single dose for children < 12 years.

	First-line	Alternative
Adults (including pregnant women)	Doxycycline 300 mg as a single dose	Azithromycin PO 1g as a single dose
Children < 12 years old	Doxycycline 2-4 mg/kg single dose	Azithromycin PO 20mg/kg single dose
Zinc supplementation for children		
Zinc supplementation in the management of children 6 months to 5 years with watery diarrhoea reduces the frequency and severity of the episode as well as the frequency of subsequent diarrhoea. When available, supplementation (20 mg zinc per day) should be started immediately		

Plan B: Oral Rehydration for Patients With Some Dehydration

(a) Patients presenting with some signs of dehydration must be admitted to the CTC/CTU.

(b) Initial treatment: give ORS according the weight of the patient (75ml/kg in the first 4 hours).

(c) Cholera patients with some signs of dehydration do not need IV fluid replacement, but they need to be monitored closely during the first 4 hours:

(i) If at any time signs of severe dehydration appear then shift immediately to Treatment Plan C.

(ii) If there are still some signs of dehydration after the first 4 hours, repeat Treatment Plan B for 4 hours and reassess.

(iii) If there are no signs of dehydration after the first 4 hours of treatment, then patients can be sent home with the same instructions described above under Treatment Plan A.

(d) If the patient vomits while taking fluid, wait 10 minutes. Then allow the patient to resume feeding, but more slowly.

(e) Continue monitoring the patient and replacing fluid until the diarrhoea stops.

(f) When the patient is ready to leave the facility, counsel the patient on treating diarrhoea at home.

(g) 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. Oral Rehydration for Patients With no Signs of Dehydration

(a) Patients with no signs of dehydration should be treated with oral rehydration solution (ORS).

(b) There is no need to admit the patients with no signs of dehydration to the CTU/ CTC. They can be treated with ORS at home, at ORPs or at the outpatient area at the health facility.

(c) If patient is seen at the health facility, keep the patient for observation for 2-4 hours to ensure they are tolerating ORS.

(d) During observation and before sending home, provide clear instructions for care. Advise patients or caregivers to continue giving ORS after each loose stool and to come back immediately if condition deteriorates (repeated vomiting, number of stools increased or if the patient is drinking or eating poorly).

(e) ORS must be prepared with safe water (boiled or treated with a chlorine product). It should not be stored for more than 24 hours (make fresh ORS daily).

(f) ORS should be given regularly, in small amounts. If a patient vomits ORS, slow the administration of ORS and then slowly increase again when vomiting stops.

(g) Patients should receive ORS after each loose stool to maintain hydration until diarrhoea stops.

(h) Patients should receive the following amounts of ORS following each loose stool:

Age	Quantity of ORS
<2 years	50–100 ml
2–9 years	100–200 ml
≥10 years	as much as wanted

Discharge

(a) Consider discharging if patient:

- has no signs of dehydration;
- is able to take ORS without vomiting;
- has no watery stools for 4 hours;
- is able to walk without assistance;
- is passing urine;
- has been advised when to return to hospital/CTC.

(b) Prior to discharge, provide patients and their care givers with ORS and instructions on how to prepare it.

(c) Inform patient, family members and care givers about precautions and instructions at household level:

- For children, continue breastfeeding of infants and young children.
- Drink and use safe water.
- Wash hands at critical times including after using a toilet (including helping a child) and before preparing and eating food. If caring for a patient, always wash hands after proving care and after handing any soiled items such as clothes or linens.
- Cook food thoroughly and eat it while it is still hot.
- Remove and wash any bedding or clothing that may have had contact with diarrhoeal stool with the appropriate chlorine solution (0.02%). If chlorine is not available, patients' bedding and clothing can be disinfected by stirring them for 5 minutes in boiling water and drying in direct sunlight, or by washing with soap and drying it thoroughly in direct sunlight.
- Use a flush toilet or approved septic system; double bag soiled materials when discarding in trash.
- Use any household disinfectant or a 1:10 dilution of bleach solution (1part bleach to 9 parts water) to clean any area that may have contact with faecal matter, as soon as possible after being soiled.
- If a household member develops acute, watery diarrhoea, administer oral rehydration solution (ORS) and seek health care immediately.

- While caring for persons who are ill with cholera, do not serve food or drink to persons who are not household members.
- Visitors can be allowed if the ill person wants company; visitors should also observe hand hygiene recommendation.
- Give patients information about home care before they leave the health facility on danger signs and when to return to the facility again. Patients should return for treatment if they develop any of the following:
  - increased number of watery stools
  - eating or drinking poorly
  - marked thirst
  - repeated vomiting
  - fever
  - blood in the stool.

(a) Give an Appropriate Oral Antibiotic for Outbreaks of Bloody Diarrhoea Due to Shigella Dysentariae Type

	NALIDIXIC ACID # Give four times daily for 5 days	**CIPROFLOXACIN** #Give two times daily for 5 days	**COTRIMOXAZOLE** (trimethoprim + sulphamethoxazole) # Give two times daily for 5 days		
WEIGHT	**TABLET** 250 mg	**TABLET** 250 mg	**ADULT TABLET** 80 mg trimethoprim + 400 mg sulphamethoxazole	**PAEDIATRIC TABLET** 20 mg trimethoprim + 100 mg sulphamethoxazole	**SYRUP** 40 mg trimethoprim + 200 mg sulphamethoxazole per 5 ml
Children's dose					
3–5 kg	¼	¼	¼	2	5 ml
6–9 kg	½	½	½	2	5 ml
10–14 kg	1	1	1	3	7.5 ml
15–19 kg	1	1	1	3	7.5 ml
20–29 kg	2	2	1	6	15 ml
Adult dose	**TABLET** 250 mg	**TABLET** 250 mg	**TABLET** 160 mg TMP +800 mg SMX		
	4 tablets	4 tablets	2 tablets		

Source: WHO Guidelines for the control of epidemics due to S. dysentariae type 1. WHO Geneva. 1995

Give vitamin A to children with measles

(a) Give the first dose in the health facility or clinic.

(b) Give the mother one dose to give at home the next day.

AGE	Vitamin A Capsules		
	200 000 IU	100 000 IU	50 000 IU
Less than 6 months		½ capsule	1 capsule
6 months up to 11 months	½ capsule	1 capsule	2 capsules
12 months up to 59 months	1 capsule	2 capsules	4 capsules

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

(b) Give Appropriate Antibiotic for Bacterial Meningitis Cases During and Outside an Outbreak

Sources:

1. Admit patient to a health facility for diagnosis and treatment.
2. Following lumbar puncture, treat every new patient who is suspected of having meningitis with antibiotics as soon as possible; Ceftriaxone is the first line treatment for bacterial meningitis (Treatment protocols in the table below).
3. Ensure any child under 2 years of age or any patient with severe symptoms is admitted to the health centre for inpatient treatment and adjust the treatment as necessary.
4. Patient isolation is not necessary. Provide good supportive care and simplify case management.

Age	Treatment protocols for bacterial meningitis during epidemics in Africa (without laboratory confirmation)
In children aged 0–2 months	Ceftriaxone 100mg/kg/day IM or IV once a day for 7 days
In children aged over 2 months	Ceftriaxone 100mg/kg/day once a day (maximum 2g) IM or IV for 5 days
In children aged >14 years and adults	Ceftriaxone 2g/day once a day IM or IV for 5 days

Outside epidemics, treatment duration should be 7–10 days for all ages

Prophylaxis for Household Contacts

Antibiotics are recommended as a prophylactic measure for household contacts of all ages in non-epidemic periods, but not during epidemics. Ciprofloxacin is the preferred prophylactic agent, with ceftriaxone as an alternative when ciprofloxacin is contraindicated.

Annex 6B: Preparing Disinfectant Solutions from Ordinary Household 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 solutions for disinfecting:** • Gloved hands • Bare hands and skin • Floors • Clothing • Equipment • Bedding
Household bleach 5% active chlorine	1 litre bleach per 10 litres 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:

(a) 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.

(b) 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.

Using Market/Shelf liquid bleach to prepare the desired % of chlorine

% Chlorine in bleach ((*Market/Shelf*) **minus** 1 = Parts of water for each part of bleach
% Chlorine desired

Example: To make a 2% chlorine solution from 5% bleach,

5 **minus** 1 = (2.5) **minus** 1 = **1.5** parts water for each part of bleach
2

Thus, to make 2% chlorine solution add 1 part bleach to 1.5 parts water

Annex 6C: Planning an Emergency Immunisation Activity

1. Review with health workers the need to plan vaccination campaigns and specify the target population for the immunisation activity.
2. Estimate the necessary amounts of vaccine, diluent and immunization supplies such as sterile syringes and sterile needles, cold boxes, vaccine carriers and safety boxes.
   (a) Coordinate with NPHCDA (department of disease control and immunization), to arrange for provision of necessary vaccines and supplies.
   (b) Coordinate with the SPHCDA (SIOs, LIOs) to plan for a reactive vaccination
   (c) Identify sites for conducting the immunisation activity.
   (d) Identify the facilities that can participate in the activity.
   (e) Identify a mobile immunisation team, if needed.
   (f) Determine if there are any hard-to-reach areas; e.g., a transient workers' camp. Identify a mobile immunisation team to reach these areas.
   (g) Contact the facilities and schedule the immunisation sites.
   (h) Make sure there is enough capacity to store extra amounts of the vaccine during storage and transportation to the immunisation site.
3. Conduct a comprehensive micro-planning for the campaign. A microplan is the operational plan for a campaign at the State or LGA level. Ensure the plan has at least the following:
   a. estimate of the number of vaccination teams required and their composition including roles and responsibilities of team members, as well as number of supervisors and monitors;
   b. Activate all the immunisation TWGs (logistics and cold chain, social mobilization, waste management, etc.)
   c. mapping of the coordination with other partners and States/LGAs local partners like NGOs, faith-based and civic organisations, etc.;

d. maps of the targeted area;
e. cold chain requirements and maintenance;
f. plan for distribution of logistics;
g. plans for disposal of waste from campaign;
h. social mobilisation plan with community leaders mapped and engaged
i. training schedule
j. list of supervisors and their contact numbers
k. travel plan for teams and supervisors including transportation requirements
l. budget estimates for the various campaign components including training and planning prior to implementation and waste disposal following implementation.

4. Select immunisation teams. For example, for every 100 to 150 people expected at the immunisation site, the following personnel are required:
   a. one to two vaccinators to give immunisations
   b. one recorder to record on immunisation cards
   c. Community mobilizer to bring target population to the vaccination post
   d. community health workers if already available or an identified community volunteer to verify age and immunisation status.
5. Work with your SPHCDA to conduct refresher training for vaccinators on recommended immunisation practices. Ensure instructions are given for the use of safe injection techniques.
6. Mobilise the community. Inform the public about the emergency immunisation activity while ensuring that there is a:
   a. clear communication plan that includes easy-to-understand information on the need for the campaign
   b. clearly defined target group for the campaign
   c. clear understanding of the dates of the campaign
   d. mechanism in the communication plan for rapidly identifying and addressing rumours that may arise during the campaign
   e. single point of contact that is well versed in risk communication and the local culture
   f. clear plan for monitoring any adverse effects.
7. Arrange personnel transportation to the immunization site.
   a. Plan their transportation to and from the site
   b. Schedule vehicles and plan for fuel and other costs

c. Estimate per diem costs and make the necessary arrangements for lodging if the site is far from the health worker's usual station.

8. Monitor the overall campaign process and the number of doses of vaccine given.
   a. Collect daily summary sheets from teams.
   b. Fill and submit vaccine accountability form daily (See Annex 6j) Calculate the amount of remaining stocks and supplies necessary for the next day.
   c. Ensure that the estimated number of individuals vaccinated is monitored daily and tracked against target population.
   d. Follow-up visit plans should be made for missed individuals based on tally/ summary sheet information.
   e. Document any missing houses/individuals who should be followed up on subsequent days.
   f. Review the team available on site and if necessary, reallocate/deploy the teams to other sites based on the workload.
   g. Conduct brief feedback sessions at the end of each day with vaccination teams and make the necessary mid-course corrections.
   h. Ensure the availability of AEFI committee and kits (refer to AEFI guideline)
   i. Fill AEFI surveillance reporting forms as necessary

NB: A rapid guide to common SIA problems and potential quick fixes is available at:

http://www.polioeradication.org/Portals/0/Document/Resources/PolioEradicators/1c.QuickFixesforSIA20100914.pdf

Also refer to the SIA field guide

Give instructions for use of safe injection techniques. Review with health workers the need to plan vaccination campaigns.

Annex 6D: Estimating Vaccine Supplies for Immunization Activities (as Appropriate and Depending on Vaccine to be Administered)

Outbreak: _____ Date confirmed: _____

Target population: ___ Children aged 0 to 5 years

Children aged 9 months up to 14 years

Children and adults age 0 up to 30 years

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

Size of target population X Number of recommended x 1.20 (wastage doses) = Number of doses to order including wastage

It is recommended that the wastage factor of 20% should be used only at the national level to estimate vaccine requirement during an outbreak. Use a wastage factor of 15% at the State and LGA levels and 10% at the health facility level.

4. Allow for a contingency 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 Contingency factor
Total number of estimated doses including wastage

It is recommended that the contingency stock be kept only at the national level. However, if a state level has adequate capacity for vaccine storage then it can also keep a contingency stock.

5. To obtain the total number of vials of vaccine to order, divide the total number of estimated doses by the number of doses contained in the vial. (This is usually printed on the label and may be one, two, five, ten or twenty doses).

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

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

_____	X	_____	=	_____
Diluent required		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. In addition, estimate the number of dilution syringes necessary for preparing the vaccine. Source: Field Guide for Supplementary Activities Aimed at Achieving Polio Eradication, World Health Organization, Geneva 1997. LGA guidelines for yellow fever surveillance, Division of Emerging and other communicable disease surveillance and control, World Health Organization, Geneva 1998.
9. Estimate the number of safety boxes required

Annex 6E: Recommended Immunization Practices

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

1. Reconstitute the vaccine correctly:
   (a) Determine the appropriate quantity of diluent to reconstitute the freeze-dried vaccine.
   (b) Use a sterile syringe and sterile needle for each dose.
   (c) Using the dilution syringe, draw up and expel the diluent several times in the vial that contains the vaccine so as to mix the reconstituted vaccine well.
2. Wrap the vial in silver foil or cover it with a dark cloth. This will protect the vial from sunlight.
3. In a field situation, protect the vaccine and diluent from contamination. Cover the open top of the vial with foil to keep out dirt and flies.
4. Store reconstituted vaccine vials and opened liquid vaccine vials immediately, standing them on conditioned ice pack. Keep the ice pack and vaccines protected from sunlight.
5. Follow multidose vial policy as applicable; e.g., for measles and polio.
6. Record the dose on an immunization card for each person immunized, if it is national policy to require immunized 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 using a sharps box.
9. Arrange for safe disposal of used injection materials at the end of the activity. They can be burnt or buried in a pit according to medical waste disposal guidelines.

Annex 6F: Sample Messages for Community Education

Message:

WASH YOUR HANDS

After defecation
After cleaning a child who has defecated
After disposing of a child's stool
before and after eating
before preparing or handling food.

Message:

ARE YOU READY FOR HAND-WASHING?

Do you have?

- Clean water and soap (or if you do not have soap, use ash or earth to scrub your hands)
- Clean cloth for drying.

Safe Handling of food

Encourage the following food safety practices:

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

DO YOU PREPARE FOOD SAFELY? Cooking kills germs

- Thoroughly cook all meats, fish and vegetables.
- Eat cooked meats, fish and vegetables while they are hot.

WASHING PROTECTS FROM DISEASE

- Wash your hands before preparing or serving food.
- Wash your dishes and utensils with soap and water.
- Wash your chopping board especially well with soap.

PEELING PROTECTS FROM DISEASE

- Only eat fruits that have been freshly peeled (such as bananas and oranges). KEEP IT CLEAN: COOK IT, PEEL IT, OR LEAVE IT..

Five Keys to Safer Food

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

Recognising and diagnosing health effects of chemicals in chemical events

Agent type	Agent name	Any unique characteristics	Initial effects
Nerve	Cylohexyl sarin Sarin (GB) Soman (GD) Tabun (GA) VX	Miosis (pinpoint pupils) Copious secretions Muscle Twitching/fasciculation	Miosis (pinpoint pupils) Blurred/dim vision Headache Nausea, vomiting Diarrhoea Copious secretions Sweating Muscle twitching/fasciculation Breathing difficulty Seizures
Asyphxiant/ Blood Arsine	Cyanogen chloride Hydrogen cyanide	Possible cherry red skin Possible cyanosis	Possible frostbite Confusion Nausea Patient may gasp for air similar to asphyxiation but more abrupt onset Seizure prior to death
Choking/ Pulmonary damage	Chlorine Hydrogen chloride Nitrogen oxide Phosgene	Chlorine is a greenish yellow gas with pungent odor Phosgene gas smells like very newly mown hay or grass Possible frostbite	Eye and skin irritation Airway irritation Dyspnoea, cough Sore throat Chest tightness
Blistering/ Vesicant	Mustard/ Sulfur Mustard (HD, H) Mustard (gas) Nitrogen mustard Lewisite (L)	Immediately decontaminate skin; flush eyes with water or normal saline for 10-15 minutes; if breathing difficulty, give oxygen and any supportive care	Possible pulmonary oedema Mustard has an asymptomatic latent period There is no antidote or treatment for mustard Lewisite has immediate burning pain, blisters later Specific antidote British Anti Lewisite (BAL) may decrease systemic effects of Lewisite
Incapaci tating/ behavior altering	Agent 15/BZ	May appear as mass drug intoxication with ecastic behavior, distinct hallucinations and confusion Hyperthermia Mydriasis (dilated pupils)	May cause death Dry mouth and skin Initial tachycardia Altered consciousness, delusions, denial of illness, belligerence Hyperthermia Ataxia (lack of coordination) Hallucinations Mydriasis (dilated pupils)

Decontamination and treatment

Agent Type	Decontamination	First Aid Access ABCs	Other patient consideration
Nerve	Remove clothing immediately. Gently wash skin with soap and water Do not abrade skin For eyes, flush with plenty of water or normal saline	Atropine before other measures Pralidoxime (2PAM) chloride	Onset of symptoms from dermal contact with liquid forms may be delayed Repeated antidote administration may be necessary
Asphyxiant/ Blood Arsine	Remove clothing immediately – if no frostbite Gentle wash skin with soap and water	Rapid treatment with oxygen For cyanide, use antidotes (sodium nitrite and then sodium thiosulfate)	Arsine and cyanogen chloride may cause delayed pulmonary oedema
Choking/ Pulmonary damaging	Remove clothing immediately if no frostbite Gently wash skin with soap and water Do not abrade the skin For eyes, flush with plenty of water or normal saline	Fresh air Forced rest Semi upright If signs of respiratory distress are present, oxygen with or without positive airway pressure may be needed Other supportive therapy as needed	May cause delayed pulmonary oedema, even following a symptom free period that varies in duration with the amount
Blistering/ Vesicant	Immediate decontamination is essential to minimize damage Remove clothing immediately Gently wash skin with soap and water Do not abrade skin For eyes, flush with plenty of water or normal saline	Immediately decontaminate skin, flush eyes with water or normal saline for 10–15 minutes	Possible pulmonary oedema Mustard has an asymptomatic latent period, there is no antidote for mustard Lewisite has immediate burning pain, blisters later Specific antidote British Anti Lewisite (BAL) may decrease systemic effects of Lewisite Phosgene oxine causes immediate pain
Incapacitating/ behavior altering agent	Remove clothing immediately Gentle wash skin with water or soap and water. Do not abrade skin	Remove heavy clothing Evaluate mental status Use restraints as needed Monitor core temperature carefully Supportive care	Hyperthermia and self-injury are targets risks Hard to detect because it is an odorless and non-irritating substance Possible serious arrhythmias Specific antidote (physostigime) may be applied

Antidote recommendations following exposure to cyanide

Patient	Mild (Conscious)	Severe (unconscious)	Other treatment
Child	Anti dotes may not be necessary	Sodium nitrite: (120.33ml/kg, not to exceed 10ml of 3% solution.) Slow IV no less than 5 minutes, or slower if hypo-tenison develops. Sodium thiosulfate: 1.65ml/kg of 25% solution IV over 10-20 minutes	For sodium nitrite- induced-orthosatic hypotension: normal saline infusion and supine position.n is recommended If still apnoeic after antidote administartauon, consider sodium bicarbonate for severe acidosis
Adult	Antidote may not be necessary	Sodium nititie: 10-20ml of 3% solution slow IV over no less than 5 minutes, or slow-er if hypotension develops. Sodum thiosulfate: 50ml of 25% solution IV over 10-20 minutes	

Note:

1. Victims whose clothing or skin is contaminated with hydrogen cyanide liquid or solution can secondarily contaminate response personnel by direct contact or through off-gassing vapours.
2. Avoid dermal contact with cyanide contaminated victims or with gastric contents of victims who may have ingested cyanide-containing materials.
3. Victims exposed only to hydrogen cyanide gas do not pose contamination risks to rescuers. If the patient is a victim of recent smoke inhalation (may have high carboxyhemoglobin levels), administer only sodium thiosulfate.
4. If sodium nitrite is unavailable, administer amyl nitrite by inhalation from crushable ampoules.
5. Available in Pasadena Cyanide Antidote Kit, formerly Lilly Cyanide Kit.

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7.0 Risk Communication and Community Engagement

Risk communication and community engagement is an essential element of disaster and emergency preparedness and response and is one of the core capacities in the International Health Regulations 2005 (IHR 2005). Risk communication and community engagement is a two-way exchange of information, perceptions and advice among risk assessors, risk managers, those affected by the threat or events and various groups of people in the society about the likelihood and consequences of harm from the event (WHO, 2005). Its ultimate purpose is to ensure that everyone at risk is able to take informed decisions to mitigate the effects of the threat (hazard) such as a disease outbreak and take protective and preventive action. Risk communication and community engagement uses a mix of communication and engagement strategies and tactics, including but not limited to, media communication, social media, mass awareness campaigns, health promotion, stakeholder engagement, social mobilisation and community engagement.

The current 21st century has been marked by an exponential growth in travel, trade, migration, as well as a communication technology revolution that has widened access to a variety of means of communication and information. The public and communities have been exposed to a variety of dynamic, fast-changing, formal and informal media, social media and complex social networks that influence how risk is communicated, perceived and acted on. The latest evidence shows that the practice of Risk communication and community engagement is a complex task that is a core public health intervention in any response to disease outbreaks/epidemics, pandemics and other health emergencies (Communicating Risk in Public Health Emergencies: Geneva. World Health Organisation 2017, License CC BY-NC-SA 3' IGO).

Risk communication and community engagement strategies are inadequate in most states in Nigeria. The strategies that have been used so far, are usually fragmented components of outbreak responses. Even so, Risk communication and community engagement is an integral part of any emergency response, thus, a living Risk communication and community engagement plan is required to reduce the spread and mitigate the impact of infectious diseases in Nigeria.

This chapter describes how to conduct Risk communication and community engagement before, during and after an outbreak. Effective communication equips those at risk with the knowledge they need to make informed decisions for protective action. It also provides decision makers with summary information especially regarding outbreak response, so that they review how resources were applied to contain the event.

7.1 Risk Communication and Community Engagement In the Context of IDSR

Risk communication and community engagement should be included in all IDSR core functions and activities, particularly detection, sample collection, reporting, analysis, interpretation, feedback, preparedness and response. IDSR core functions and activities for each level of the health system are well illustrated in the Introduction section of this guideline. Effective Risk communication and community engagement is therefore needed to achieve IDSR objectives.

If Risk communication and community engagement is well planned and integrated into IDSR, it can improve decision making and the adoption of recommended behaviours by communities and also contribute to the prevention, control and response to priority diseases and other public health events. Such communication needs to be carefully planned, implemented and properly integrated with emergency management activities and operations at the community, LGA, State and National levels to support all relevant core IDSR functions and related activities.

7.1.1 Benefits of Risk Communication and Community Engagement

- Risk communication and community engagement improve decision-making
- Compliance with treatment and the required behaviours for preventive actions
- It promotes transparency and accountability and builds trust with individuals, community leaders, health workers partners and policymakers
- It promotes the primary public health goal of rapid outbreak containment, thereby preventing avoidable deaths and diseases with the least possible disruption to economies and society

- During epidemics, pandemics, humanitarian crises and natural disasters, effective risk communication and community engagement enables people who are most at-risk to understand and adopt protective behaviours
- It enables the authorities and experts to heed and address people's concerns and needs, and to offer advice that is relevant, trusted and acceptable.

When the public is at risk of a real or potential health threat, direct interventions may take time to organise and resources may be limited. Hence, communicating advice and guidance is often the first and most important public health tool in managing a risk. Proactive risk communication and community engagement encourages the public and service providers to adopt protective behaviours when they are linked to functioning systems and services. It facilitates heightened disease surveillance, reduces confusion, and minimisTes miscommunication and falsehoods (rumours) related to the cause and transmission of a disease as well as proven effective protective actions. It allows for better use of resources, which is crucial to effective response (WHO, 2008).

7.1.2 Target Audiences for Risk Communication and Community Engagement

Risk communication and community engagement officers should conduct regular audience mapping and segmentation to enable them target specific audiences with relevant messages. The list below is not exhaustive

- Community: All people at risk of acquiring a disease or in need of health services within the context of the public health event
- Healthcare providers and first responders
- Private hospitals and clinic staff
- Surveillance officers
- Laboratory personnel
- Abattoir workers, live bird marketers and livestock marketers
- Points of entry and exit stakeholders and other relevant personnel
- Airlines staff

- immigration officers
- transporters and travellers
- security agencies
- stakeholders (policymakers, Government Ministries, Departments, and Agencies, partners, civil society organizations, community organisations, etc.)
- media as a channel to reach these audiences
- schools and workplaces
- traditional and religious leaders

7.1.3 Community Engagement and its Relevance to Public Health Emergency Preparedness and Response

Community engagement is crucial to risk communication. It is the process of working collaboratively with and through people affiliated by geographical proximity, special interest, or similar situations to address issues affecting their well-being and is often used as an active method of implementing change. During risk communication, the emphasis is on building relationships and trust.

The steps for community engagement include:

(a) developing a plan with clear goals

(b) determining who to engage

(c) developing engagement strategies

(d) prioritising these activities

(e) designing an implementation plan

(f) monitoring progress

Nigeria has risk communication structures at various levels such as:

1. The National Health Promotion Forum, National Risk Communication Technical Working Group, Advocacy Communication and Social Mobilisation Working Group at national level.
2. At the State and LGA levels, there are Social Mobilisation Committees.

3. Ward Development and Village Development Committees coordinate: Risk communication and community engagement activities at their various levels.

Refer to annex 7 F for the List of Stakeholders and Partners for risk communication and community engagement.

Effective community engagement helps you to:

(a) know the community (problems and needs)

(b) understand existing health beliefs, attitudes and practices

(c) listen to the community carefully

(d) analyse community dynamics

(e) involve the community in all aspects of the response beginning from planning stages.

7.1.4 Risk Communication and Community Engagement Approaches

Strategies for effective emergency risk communication and community engagement include: Stakeholder relations and community surveillance, precautionary advocacy, crisis communication, and outrage management.

Strategy 1: Stakeholder relations (and community surveillance): is when the hazard is relatively small and emotional engagement is low or there is apathy.

Goals

- monitor communications surveillance to identify and address outrage early (before the situation moves to outrage management)
- maintain public and stakeholder engagement in ongoing projects

Notes

- craft messages based on strong scientific evidence
- disseminate general information, which is usually sufficient, but watch out for problems early
- rely on audience self-motivation to seek out and use communications products
- understand that it is unlikely to achieve major changes on its own

Examples

- using a website or newsletter to keep parents informed about the best nutrition for their babies
- leaflets on food safety, physical activity, medical screening, etc.

Strategy 2: Precautionary advocacy: is when the hazard is big, but people are not very concerned or outraged. They may be apathetic to the issue.

Goals

- Arouse emotions – trigger the public to bring them to your level of concern so that they take action.

Strategy 3: Outrage management: is when the hazard is small (little or no real danger) but people are very outraged or upset, or their response is out of proportion to the real risk.

Goals

1. Calm the public down, respectfully and reasonably.

- Listen to their concerns first.
- Communicate facts and evidence; respectfully acknowledge anger and fear.
    i. Explain the actual danger
    ii. Cite credible third parties (experts, scientific research, etc.).
    iii. Correct misinformation.
    iv. Resolve rumours.

Act: there is a time pressure to communicate early and frequently.

Strategy 4: Crisis communication: is when the hazard is large or imminent, and fear is also (appropriately) high.

Goals:

- Put everyone on the same page in terms of information.
    i. Explain what is happening, explain early and keep providing information frequently.

ii. Tell people what you know, what is being done and when you will communicate next.
iii. Correct misinformation and resolve rumours.
iv. Messages may be based on uncertain scientific facts.
v. Be transparent; admit what you do not know. In a crisis, much of the information is likely to be missing or at least uncertain at first.
vi. Modify behaviour
vii. Send a message that creates an impetus to act.
viii. Give people something to do (making risk seem controllable).
ix. Deal with emotions.
x. Show empathy.
xi. Do NOT over-reassure.

Use a mix of methods: social mobilization, social media, mass media, trustworthy interlocutors. Update information daily or even more frequently in the acute phase.

Listen for concerns and address them proactively.

i. Ascertain degree of fear/concern is necessary to motivate people to act to protect their health.
ii. False assurances that later turn out to be unfounded erode trust
iii. communicate a sense of "we are all in this together".

These can be achieved through:

(a) health education
(b) social mobilisation
    a. Community engagement
    b. Traditional media
    c. Social media
    d. Outbreak communication
    e. Messaging (information, education and communication (IEC) and behaviour change communication (BCC)
    f. Rumour monitoring and management
    g. Advocacy.

7.1.5 Integrated Risk Communication and Community Engagement Model

Since risk communication and community engagement is a complex activity involving different audiences, it is crucial to adopt an integrated approach. The key components for integrated Risk communication and community engagement are presented in Figure 7.1. This model allows for the successful design and implementation of an effective communication strategy. It highlights the need for a collaborative approach between different target audiences across board.

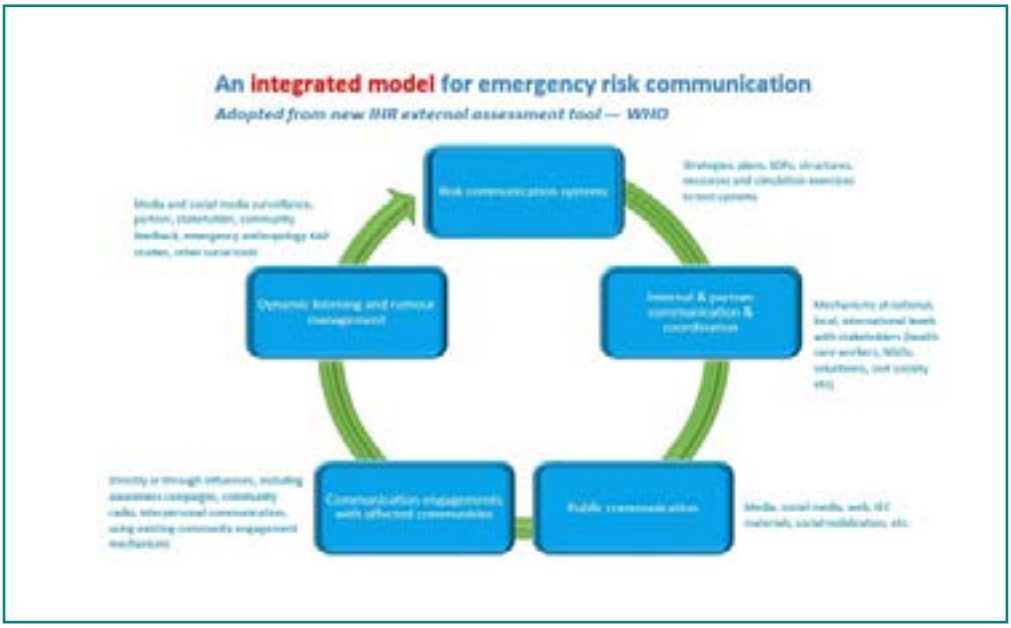


Figure 7.1: Integrated Model for emergency risk communication

7.2 Key inter-linked Principles for Effective Communication

There are five key principles for effective communication as outlined below:

I. Creating and Maintaining Trust

Building and maintaining trust is, arguably, the most important function in effective communication during an outbreak or a public health event and should include:

(a) Timely, transparent information regarding the nature of the threat

(b) The response to the event

(c) Actionable advice on protective actions people can practice, together with functioning services leading to increase self-efficacy.

This creates trust in the response and the response teams, thereby increasing the likelihood that they will follow the advice given. Trust is now considered the most important requirement for effective risk communication and community engagement.

According to the latest evidence, Risk communication and community engagement in health emergencies should include genuine participation of the population, taking into account three key elements, namely:

(a) Understanding the specific context, concerns, beliefs, practices and traditions of the population concerned in order to develop scientific and logistical information and explanations that address community concerns (social science intelligence)

(b) Provision of understandable and trusted advice that they are likely to follow to save lives and curb the outbreak within the shortest possible time; such advice is provided in their own languages, adapted to their educational levels and preferences (i.e. oral or visual) and disseminated through their preferred channels and interlocutors (translational communication)

(c) Meaningful community engagement and the participation of (their) trusted interlocutors/messengers (means of dissemination).

Risk communication and community engagement should include timely, transparent, understandable information relayed to the affected and at-risk population on:

1. risk they face
2. the response that is being organised; and
3. what they can do to protect themselves and their loved ones

Trust is therefore the currency for all public health interventions, and has, in the current era of information overload, emerged as the critical element for effective Risk communication and community engagement (i.e., ensuring that expert advice is acted on by key stakeholders and affected and at-risk populations). Risk communication and community engagement should therefore be aimed at building, maintaining or restoring public trust in those tasked with risk management. The latest evidence from 21st century epidemics reveals that, in order to build trust, risk communication and community engagement activities should:

(a) Be linked to functioning and accessible services

(b) Be transparent and timely

(c) Be easy to understand for target populations (i.e., in their preferred oral or visual formats; in their own languages or dialects; and tailored to their educational levels and cultural preferences)

(d) Acknowledge and communicate uncertainty (neither over-reassure nor speculate; rather, communicate frequently so that the evolution of the event and public understanding are transparent and sustain trust)

(e) Link to self-efficacy (Can people really do what you ask them? Do they have the ability, equipment, services, education they need to adopt our advice?)

(f) Be disseminated using multiple platforms, methods and channels

(g) Identify, involve and collaborate with people that the community trusts when making decisions and not just in information dissemination. This ensures that interventions and any communication on them are contextually appropriate and community owned.

II. Timely Announcements and Transparency:

In most cases, public response to a health threat depends on the way the first and subsequent announcements are made. This means that an event or threat should be announced as and when it emerges, even when the information is incomplete or changing fast. This in turn implies that communicating uncertainty is a cornerstone of risk communication and community engagement. Communication by authorities, response managers or front-line personnel must include:

(a) information about the uncertainties associated with the risk, event and interventions

(b) information indicating what is known and unknown at each given moment in time

(c) a commitment and follow-up to keep people frequently informed and updated on the changing, uncertain situation

(d) multiple platforms, mechanisms and trusted spokespersons to ensure that consistent and coordinated information reaches stakeholders and the population.

III. Listening to, understanding and respecting public concerns

Understanding public perceptions, concerns, fears and expectations is as critical to risk communication and community engagement as understanding the risky practices and behaviours that affect risk. The understanding of communities must start before and during an emergency. There are many ways to improve awareness of community concerns and understand the contexts that determine whether the advice given to them on corrective or preventive practices will actually be accepted and acted upon. These include knowledge, attitude and practice (KAP) surveys or mini-surveys, community walk-throughs, focus group discussions, key informant interviews, getting feedback from stakeholders, social media and media monitoring, etc. A serious attempt must be made to execute health interventions and offer health advices, based on evidence gathered using these methods and other social science approaches.

IV. Advance planning

Risk communication and community engagement is most effective when it is integrated with emergency preparedness, risk analysis and response (risk management). This means that a risk communication and community engagement plan must be prepared during the preparedness stage. Emergency risk communication and community engagement planning must occur in advance and be a continuous process focused on preparedness, prevention and response. Planning should be sensitive to stakeholders' needs, participatory, responsive to the context of affected groups and should include feedback from such groups.

The IHR (2005) require all governments to build national capacity for detection, alert and response to public health emergencies. One of the core capacities is risk communication and community engagement. Accordingly, risk communication and community engagement planning should include the systems required

(strategies, plans, SOPS and mechanisms at the national, State and LGA levels), the coordination of partners, sectors and stakeholders, the capacity for fast, effective public communication in the preferred languages and channels of the population, the ability to track and quickly manage concerns, perceptions, rumours and misinformation, and communication engagement with affected and at-risk communities.

V. Ensuring equity

All citizens have a right to appropriate information about health risks, including what needs to be done in response to threats to their health. Unfortunately, large segments of society are excluded from routine communication about threats to health. Risk communication and community engagement must therefore ensure equitable sharing of information to the public and avoid exclusion of marginalized members of society from health action. This means paying attention to the reach of communication, using trusted channels and interlocutors, avoiding jargon or technical language, using the people's own languages and dialects, adapting messages to people's levels of understanding and education, and ensuring that the actions promoted are those that people can realistically change. Special attention should be paid to analysing power dynamics in communities and taking special measures to reach hard-to-reach (riverine, mountainous, nomadic, security compromised communities, etc) and vulnerable populations (women, minorities, the very old and young, people with disabilities, the poor, migrants,refugees, etc.).

7.3 Create an Enabling Environment for Effective Communication to at-risk Populations

(a) Establish Risk communication and community engagement systems and structures at the LGA, State and national levels:

(i) if unavailable, establish multisectoral communication committees/ structures across all levels; i.e., national, State and LGA levels (See Annex 5E for examples of members of the communication subcommittee and their roles). TORs can be expanded depending on the pre-outbreak, outbreak and post outbreak phase in line with each function. See Annex 7F for an expanded list of possible stakeholders

(ii) review the existing risk communication and community engagement structures and mechanisms.

(b) Ensure that the communication system has a link to the community leadership structure since they wield great influence within the community. A quick assessment can be made to evaluate the framework for public health emergency risk communication and community engagement, and this can include:

(i) conducting an assessment to identify risk communication and community engagement needs based on risk profile

(ii) preparing a mapping and developing a database of Risk communication and community engagement stakeholders at all levels

(iii) preparing a resource mapping for risk communication and community engagement.

(c) Conduct mapping of languages and dialects, religions, preferred and trusted means/channels and speakers for communication, as well as traditional practices relevant to the top priority health risks and use all this information to shape risk communication and community engagement strategies and plans.

(d) If none is available at the LGA and State levels, identify a government spokesperson and ensure that he/she is trained in public communication procedures.

(e) In addition to risk communication and community engagement personnel, all frontline personnel should receive basic training in risk communication and community engagement (surveillance, contact tracing, active case search, case management, social mobilization, burial teams, health personnel, volunteers, etc.)

(f) Develop a Risk communication and community engagement plan for Public Health Emergencies at LGA, State and national levels and ensure that key stakeholders are given some orientation on risk communication and community engagement procedures.

(g) Develop a coordination platform as well as internal and partner communication mechanisms for engaging key stakeholders, including media outlets and community radio networks and a definition of roles and responsibilities.

(h) Have detailed budgets and advocate strongly for resources mobilization, and multisectoral collaboration to implement public health emergency and Risk communication and community engagement activities at all levels.

(i) Address perception, risky behaviours, rumours and misinformation.

(*See Annex 7E for checklist on Risk communication and community engagement monitoring).*

7.4 Communicating Before, During and after the Outbreak

7.4.1 Pre-outbreak/Routine Risk Communication and Community Engagement

A large proportion of communication activities should be implemented in the pre-emergency phase to ensure better preparedness. Those managing communication activities should take advantage of the absence of an emergency to build the national communication capacity and develop communication plans and tools that will bring the country to a high level of communication preparedness. The pre-emergency phase should also be used to develop the necessary communication messages and materials as well as promote the practice of risk-prevention behaviours.

Implementing risk communication and community engagements before an emergency:

- Ensure that the Public Health Emergency Management Subcommittee for Risk Communication meets at least once monthly or quarterly to:
    i. Review the risk communication and community engagement plan
    ii. Review risk communication and community engagement materials/logistics
    iii. Develop, pre-test, print and disseminate appropriate IEC materials based on the common public health risk
    iv. Organise the training of risk communication and community engagement resource teams
    v. Ensure that the communication coordination mechanism is in place with clear terms and well-defined roles and responsibilities for each entity
    vi. Organise periodic interactions with stakeholders who will be involved in Risk communication and community engagement for prevention, preparedness or response, should an event or emergency occur. These include political, traditional and religious leaders, partners, LGA, State or national media, community radios, civil society, and stakeholders from other sectors; like the animal health and environment to promote one health
    vii. Review past emergency communication interventions to draw lessons learnt, build on successful practices and avoid negative ones
    viii. Collect and analyse epidemiological and social data about periodic disasters and outbreaks; outbreak seasons of common diseases, expected at-risk communities/populations; as well as accessible and credible channels of communication.
- Build capacity for outbreak communication and identify/train spokespersons to be ready when an outbreak occurs.
- Alert all relevant entities and notify them on their role(s) in case the expected outbreak occurs.
- Ensure that messages and materials have been developed, pre-tested and are ready for production and dissemination.

- Ensure that all required training modules, guidelines and monitoring checklists are developed and updated.
- Develop and share standard operating procedures (SOPs) for social mobilisation, community engagement and ensure the integration of risk communication and community engagement in the overall emergency response plan.
- Identify and prepare the database of stakeholders and partners, such as groups or organisations that focus on youth or women, schools, religious institutions, CSOs, media groups, theatre groups, and other community groups that can disseminate messages at the grassroots level and involve them in preparedness activities.
- Identify all the channels of communication available to spread the message and assess the reach and credibility of these channels.
- Produce a "Response Kit" which includes key frequently asked questions, media briefs, training manual, micro-planning tools, monitoring checklists/tools, communication plan templates and key IEC messages/materials for rapid distribution. This kit is intended for the use of communication practitioners at all levels.
- Establish communication lines with the media, journalists and radio/TV stations, train and regularly update them.
- Pre-arrange activities with theatre groups, musicians and traditional community entertainers.
- Identify and train community health workers, community leaders, religious leaders, influential people, women's groups, youth groups and other social mobilisers in Social Behavioural Change Communication (SBCC) and risk communication and community engagement.
- Identify mechanisms for communicating with hard-to-reach and vulnerable populations (the aged, persons with disabilities, children, the nomadic) and with isolated communities to ensure that they have access to health protection information and assistance.
- Define communication channels that can be used to reach vulnerable groups.

- Disseminate messages that describe the actions that the government is taking to protect the public and healthcare workers, promote awareness of the imminent health threats and preventive behaviours and actions that individuals, families and communities can take to reduce the risk. This can be done through the mass media, such as local community radios, public health address systems, community drama groups, television, print media and social media (Facebook, WhatsApp, twitter, etc.).
- Conduct community engagement activities and build trusted relationships between those in authority and communities through training, dialogue, consultations and capacity building. It is important to note that effective community engagement is based on trusted relationships between those in authority and communities. Therefore, use every opportunity to strengthen these relationships during non-emergency periods.
- Use ongoing health education, health promotion and other means to create, test and build trust in the systems. Interlocutors can be used for risk communication and community engagement during emergencies.
- Make arrangements for a hotline facility, (dedicated phone number, call centre etc.) which can be started immediately when the emergency occurs.
- Establish a media monitoring team to monitor the news and social media.
- Maintain and update a list of media houses and other stakeholders
- Develop plans for routine monitoring of misinformation and rumours and set up a media monitoring system to keep track of behaviours and practices related to the emergency.

It is important to integrate, to the extent possible, social science data that should be gathered as well. Data on the context and sociocultural information (including education, traditional practices, health-seeking, healthcare behaviour and beliefs) relevant to priority hazards and epidemic-prone disease should also be obtained. This will make it possible to contextualize epidemiological data and create risk-based real intelligence and thus tailor possible health interventions accordingly.

7.4.2 During Outbreak Response

During an outbreak response, and when the public is at risk of a real or potential health threat, treatment options may be limited, direct interventions may take time to organise and resources may be few. Communicating advice and guidance, therefore, often stands as the most important public health tool in managing a risk. The focus of outbreak communication is to promote outbreak control and mitigate disruption to society by communicating with the public in ways that build, maintain or restore trust.

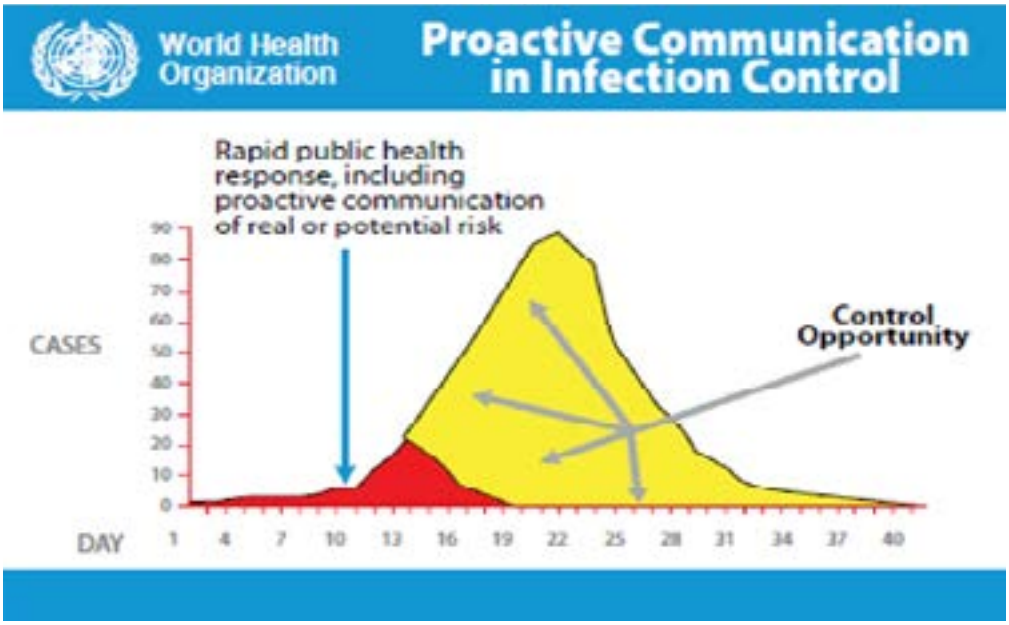
Proactive communication encourages the public to adopt protective behaviours, facilitates heightened disease surveillance, reduces confusion, fear and allows for a better use of resources, all of which are necessary for an effective response. Proactive communication also shows that health authorities are in control of the situation and care about the public. Hence, it builds trust between such authorities and the community at large.

People have a fundamental right to information and participation. In addition to the public health objectives, remember that people have a right to information on protective actions and they have a right to participate in and shape interventions that are acceptable to them.

Figure 7.2 illustrates a typical epidemic curve which tracks number of cases over time that could occur during an infectious disease outbreak. The yellow area represents the number of cases which could be avoided through the control opportunity of a rapid response to the threat.

The blue arrow indicates the point at which proactive communication plays a crucial role in supporting such a rapid response.

By alerting a population and partners to an infectious disease risk, surveillance of potential cases increases, protective behaviours are adopted, confusion is limited, and communication resources are more likely to be focused and optimised. Effective communication can help limit the spread of a disease and ultimately save lives. It also minimises damage to societies and economies and can help communities recover faster from a health event or emergency.



Source: adapted from figure 2, page, XII, World Health Report 2007

Fugure 7.2 Epidemic curve showing the importance of proactive communication

7.4.2.1 Identify and Coordinate Partners and Other Stakeholders During an Outbreak

Outbreaks usually create fear in the community. The involvement of several different stakeholders sometimes leads to lack of coordination and the duplication of efforts. Provision of timely and accurate information through a well-coordinated mechanism is important.

Internal coordination: Communication among national stakeholders is crucial during an emergency. The risk communication, community engagement and social mobilization

subcommittee described in chapter 5 is responsible for ensuring that an internal communication system is established among national stakeholders to ensure the timely flow of information to various government sectors.

Partner coordination: is another key essential element during outbreak and event response and is aimed at fostering ownership, effective participation of key players and efficient use of resources. See Annex 7F for the potential partners and stakeholders who can be involved. It establishes routine communication structures among health workers, community and partners. It helps ensure that this vital link is available and functional during an emergency. If the LGA, State or national level has a risk communication and community engagement plan, these would have been addressed in the Plan.

Coordination helps ensure that messages reaching the population are consistent and not contradictory or confusing, thereby promoting trust and the likelihood that expert advice will be followed.

The PHEMC through the PHEOC or through a similar coordination structure at national level may take responsibility for ensuring that communications are consistent and reflect the data that has been analysed. Ensure that the focus of communication activities is transparent and accurate and take into account community experiences and expectations regarding the outbreak.

There is need to distinguish between communication with stakeholders who are experts and those who are part of the response and those who require a more layman's description and explanation. These and other important interlocutors such as the media and civil society (and the general population) will require targeted and adapted products and messages. This means that carefully segmenting and targeting audiences, as well as adapting materials, messages and mechanism to suit each of them is essential.

7.4.2.2 Communicate With the Affected Community and Stakeholders

Communication with affected communities and stakeholders, including the media 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 press releases, press conferences, television and radio messages, meetings (health personnel, community, religious, opinion and political leaders), educational and communication materials (posters, fliers), to multimedia presentations (films, video or narrated slide presentations) at the markets, health centres, schools, women's and other community groups and service organizations, religious centres, local community media, Social media (Facebook, Twitter, WhatsApp, etc.), SMS, telephone, hand-carried message, community drama groups/ play groups, site visits, fax, email updates and exchanges of communication materials through more formal decision-making committees. Regardless of the mechanism, ensure that the focus is on transparent and trustworthy communication that considers community experiences.

Consider the following points when preparing messages:

- Make sure messages are clear and understandable to the audience: What is happening? Why and how is it happening? What threats to health do exist or are likely to occur? What should the public do? Where can people get services or information? What assurances can be given? Are the messages written in an understandable language and tailored to the audience's level of understanding? Research shows that risk should not be explained in technical language.
- Consider these factors when providing messages: Who is your audience? What do you want your audience to do after hearing the message? Do they have an enabling environment

to do as advised? Are there functioning and accessible services that enable them to follow the advice?

- Promote dialogue: Ensure that there is a two-way communication/exchange; listen to the audiences' concerns and respond appropriately rather than just informing.
- Demonstrate empathy and be caring: Are you showing empathy for their suffering? Are you being too cold and detached? Are you respectful?
- Provide harmonized and consistent messages: Ensure that consistent messages reach the public, notwithstanding the variety of partners involved in the dissemination of information. Use message maps and other tools to keep the same frame and logic for the messaging as this would enable partners to adapt to the context of more segmented audiences. Are messages consistent regardless of who is issuing them? Inconsistent or conflicting messages create confusion and destroy trust in the response and authorities.
- Establish a mechanism for continuous collation of facts and figures about the public health event.
- Update public information messages and share them with stakeholders involved in information dissemination.
- Ensure relevance: Communicate data/information that best illustrate your point, factoring in community concerns. Use examples that relate to the audience.

Consider pre-testing messages from similar settings before dissemination.

In case of rumours, quickly address them and any inaccuracies in general and especially within the specific community where they occur. Consider setting up a rumour monitoring system.

Widespread damaging rumours should be counteracted through public statements or press conferences. Provide comprehensive information to prevent rumours being generated from your response.

Build, maintain and restore trust as you communicate: Be as courteous as possible in your communication. Give health education messages to trusted and respected community leaders and ask them to transmit to the community. Only authorised and credible persons should communicate during crisis periods.

On a regular basis, LGA and State medical officers should meet with the local leaders to provide:

- Frequent, up-to-date information on the outbreak and response
- Clear and simple health messages for the media
- Clear instructions to communicate to the media only the formation and health education messages provided by the (PHEMC)

7.4.2.3 Distribute IEC Material and Develop Fact Sheets

Fact sheets are brief summaries of 1 to 2 pages. They are usually prepared by health workers for consumption by the general public and deal with a single topic or message. For example, a fact sheet on a Lassa fever outbreak in an LGA may contain the following information for the community: the cause of Lassa fever, how it is transmitted, signs and symptoms, steps for prevention, updates on the location, 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. Where possible, transform the fact sheets into audio products (audio files, short audio recordings on a phone), scripts or visual products (like posters or infographics). These can be used depending on the preference of the audience (oral or visual/written/illustrated communication). See attached example in the Annex 7A.

Also distribute other prepared IEC materials. Ensure that they have been pre-tested with the target audience to ensure comprehension and meaning.

7.4.2.4 Develop and Distribute Public Health Situation Reports During Outbreaks

In Nigeria, the national level or the State publishes public health bulletin. Rather than being published only during outbreaks, these bulletins should be produced more regularly and describe the outbreak, including trends, i.e., situation reports (Sitrep). These situation reports or bulletins have a wider audience than just the health worker in a particular LGA or health facility. They are usually brief (2 to 8 pages) and are also read by policymakers, legislators and other decision-makers. They are valuable channels for reaching technical and donor partners.

NCDC publishes a weekly epidemiology report all year round. This should be maintained, and States are encouraged to do same on a monthly basis.

During outbreaks, sitreps should be produced daily. The report describes trends and situation reports during outbreak settings. These reports have a wide audience other than just the health worker in a particular health facility, LGA, State or the country.

The bulletins contain at least:

(a) A summary table showing the number of reported cases and deaths to date for each priority disease

(b) A commentary or message on a given disease or topic

(c) Any relevant social science data on risky practices, behaviours and other factors

If a national public health situation report is sent to the LGA office, display it where everyone can see it. Make copies and distribute to health facility staff. Take a copy of the report with you on your next supervisory visit to show health workers how data produced during outbreak contributes to public health. A sample template for preparing a situation report is presented in Annex 4L.

7.4.2.5 Communicating to the Media

The media is a major influence and should be seen as a partner in risk communication and community engagement. However, the media is often associated with political parties or private interests and can therefore have biases of their own. They are also able to find and report on people's concerns, sensationalize stories and may not always rely on facts and evidence. Therefore, it is essential to meet regularly with the media, brief and educate them on priority hazards and response systems, and also provide them with appropriate information so as to cultivate a respectful and trusted relationship with them. The media will ensure wider dissemination of messages on radio or other appropriate channels.

As part of your risk communication and community engagement plan, determine how you will announce news of the outbreak and then keep the media regularly informed. Often, regular press releases and media briefings are appropriate tools for communicating with the media. If the emergency is complex, convening a workshop with targeted media is helpful to ensure correct information is disseminated, as most journalists have not been trained in medicine or public health.

In addition, it is good to develop media kits which could include fact sheets and community messages about the priority diseases and events.

Prior to the outbreak, ensure that you have reached out to the media and identified the key outlets you will need to work with during an outbreak. It is also good to identify, prior to an emergency, the clearance process for media products and appreciate the following:

- Ensure prompt and frequent access to experts, officials and spokespersons who will speak authoritatively and credibly on the issue at hand.
- Give exclusive stories and interviews to provide a different perspective.
- Provide media training to spokespersons.

- Spokespersons should be able to speak in layman's language, clearly explain scientific ideas and terms, avoid speaking in jargon, and illustrate the information provided with easy-to understand stories or examples. Talking points having the latest information could be used, with the messages kept as simple as possible. Ensure that the identified spokespersons are able to clearly communicate the uncertainty in an evolving event and to admit it when they do not know something. Community case definitions (see annex1B)and job aids will help the spokesperson to deliver correct messages.
- Promptly answer journalists` calls to show your respect for them.
- Provide them with accurate and well-explained information.
- Provide human interest stories.
- Give them clear easy-to-use handouts (written, audio, visual or audiovisual).

Monitor the media daily to see how the outbreak is being reported. Include social media in your monitoring strategy. If you feel that the wrong messages are being disseminated, devise a strategy for correcting this misinformation.

Release information to the media only through the spokesperson to make sure that the community receives clear and consistent information.

7.4.2.6 Communicating to Health Workers

Communicate regularly with health workers by providing correct information pertaining to the outbreak. It is important to communicate with health staff at the various levels about the data sent (including any gaps), analysis results for such data and the measures being taken to respond to the potential public health event which they have reported. Communication can also include providing participating health care workers with any outbreak or event response reports for future reference.

Make sure that health workers provide correct information on number of cases and any deaths that have occurred. Provide any changing information on case management or any other response intervention.

Encourage health workers to keep updated information and to update it in real-time during an event or emergency using reliable sources such as NCDC website (www.ncdc.gov.ng) and WHO's knowledge transfer platform (www.OpenWHO.org) on common re-emerging and emerging epidemic-prone diseases and on risk communication and community engagement.

Increasingly during emergency response to disease outbreaks, WHO will provide real-time online, off-line or face-to-face training to update health care workers and response teams. These provide an opportunity to update or acquire knowledge and skills.

7.4.3 Post-outbreak Response

7.4.3.1 Prepare an Outbreak or Event Response Report

After an outbreak or event response has taken place, LGA staff who 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, which decisions were taken and what recommendations were made. Make sure that the health unit that reported the initial cases receives a copy of the report. See Annexes 4k and 4L at the end of this chapter for examples of recommended formats and samples.

7.4.3.2 Evaluate Lessons Learnt in Order to Strengthen Appropriate Public Responses to Similar Emergencies in the Future.

(a) Assess the effectiveness of the communications team in each phase and area of work.

(b) Assess the effectiveness of meetings.

(c) Assess the effectiveness of the internal flow of communications.

(d) Assess the monitoring of communications and of the media.

(e) Assess the response of the communications media.

(f) Assess the outputs and outcomes of risk communication and community engagement

7.4.3.3 Periodic Testing of the Risk Communication and Community Engagement Plan

Carry out simulations to test the Risk communication and community engagement plan in order to detect possible weaknesses or gaps that need to be corrected before an emergency. Revise the plan based on lessons learnt from the simulation exercise, AAR or other assessment done.

(WHO provides ready-made desktop and other simulation exercises on the www-OpenWHO.org)

7.5 Annexes to Chapter 7

Annex 7A IHR core capacity monitoring questionnaire for Risk communication and community engagement

Annex 7b List of stakeholders and partners for risk communication and community engagement

Annex 7C Sample press release during outbreak

Annex 7A: IHR Core Capacity for Monitoring Risk Communication and Community Engagement

IHR Core Capacity Monitoring Questionnaire: Risk Communication and Community Engagement
1. Have risk communication and community engagement partners and stakeholders been identified?
2. Has a risk communication and community engagement planA been developed?
3. Has the risk communication and community engagement plan been implemented or tested through actual emergency or simulation exercise and updated in the last 12 months?
4. Are policies, SOPs or guidelines developed on the clearanceB and release of information during a public health emergency?
5. Are regularly updated information sources accessible to media and the public for information dissemination? C
6. Are there accessible and relevant IEC (Information, Education and Communications) materials tailored to the needs of the population? D
7. In the last three national or international PH emergencies, have populations and partners been informed of a real or potential risk within 24 hours following confirmation?
8. Has an evaluation of the public health communication been conducted after emergencies, for timeliness, transparencyE and appropriateness of communications been carried out?
9. Have results of evaluations of risk communication and community engagements efforts during a public health emergency been shared with the global community?

A. Plan includes inventory of communication partners, focal points, stakeholders and their capacities in the country
B. Procedures in place for clearance by scientific, technical and communications staff before information is released during public health events
C. This may include website/webpage (national level), community meetings, radio broadcasts nationally as appropriate etc.
D. The views and perceptions of individuals, partners and communities affected by public health emergencies should be systematically taken into account; this includes vulnerable, minority, disadvantaged or other at-risk populations.
E. Transparency here implies openness, communication and accountability, i.e. all information about public health risk is open and freely available.

Annex 7B: List of Stakeholders and Partners for Risk Communication and Community Engagement

(Composition of National Risk Communication Technical Working Group)

- Federal Ministry of Health
- Federal Ministry of Agriculture and Rural Development
- Federal Ministry of Environment
- Federal Ministry of Information and National Orientation
- Federal Ministry of Education
- Federal Ministry of Interior
- Federal Ministry of Defence
- Federal Ministry of Women Affairs
- National Quarantine services
- National Primary Health Care Development Agency (NPHCDA)
- Port Health Services
- National Populaton Commission (NPC)
- Para- Military/ Security Agencies
- National Emergency Management Agency (NEMA)
- Office of the National Security Adviser (ONSA) Chief Medical Officer
- National Orientation Agency (NOA)
- National Environmental Regulatory Agency (NERA)
- National Food, Drugs Administration and Control (NAFDAC)
- Nigeria Metrological Agency (NIMET)
- Development Partners (WHO, CDC, UNICEF and others)
- Other Relevant Professional Regulatory Bodies and Associations.
- Nigerian Police Force: Attention The Force Medical Officer/ AIG Medical
- Nigeria Nuclear Regulatory Agency
- Energy Commission of Nigeria
- National Oil Spill Detection and Response Agency (NOSDRA)
- Petroleum Product and Marketing Corporation
- Nigeria Petroleum Corporation
- Federal Airport Authority
- Federal Road Safety Commission
- Federal Fire Services
- National Environmental Standards and Regulations Enforcement Agency (NESREA)

Annex 7C: Sample Press Release During Outbreak

Press Release - NCDC and NPHCDA Continue to Respond to Yellow Fever Outbreak of in Bauchi State

Thu 19 Sep 2019

19 September, 2019 | Abuja – NCDC AND NPHCDA CONTINUE TO RESPOND TO YELLOW FEVER OUTBREAK OF IN BAUCHI STATE The Nigeria Cent...

7.6 References

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4. World Health Organization Outbreak Communication Planning Guide, 2008 Edition
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6. Communication for behavioural impact (COMBI)
7. http://www.who.int/ihr/publications/combi_toolkit_outbreaks/en/
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13. http://www.who.int/ihr/publications/outbreak-communication-guide/en/

8.0 Monitor, Supervise, Evaluate and Provide Feedback to Improve the Surveillance and Response System

Monitoring of surveillance and response systems refers to the routine and continuous tracking of planned surveillance activities (for example, prompt delivery of reports), while evaluation, which is done periodically (for instance, annually), assesses whether surveillance and response objectives have been achieved. Both monitoring and evaluation help to understand if the system has been working effectively. By evaluating information regularly, for example at the end of a given year, supervisors are able to determine whether surveillance and response objectives have been achieved and whether outcomes are of high quality. Through supervision, supervisors and health professionals work together to review progress, identify problems, determine causes of the problem and develop feasible solutions. Sustainable supervision and feedback have been shown to contribute to improved performance of national disease surveillance systems.

This chapter describes how to routinely monitor and annually evaluate performance of the surveillance system and specific disease or public health event control and prevention programmes. It concentrates on core surveillance functions described in the introduction section, and also describes how supervision and provision of feedback are key to improving the surveillance and response systems.

Some benefits of routine monitoring of the IDSR system are:

(a) tracking progress of implementation of planned activities and ensuring that planned targets are achieved in good time

(b) tracking progress of improvements in targeted indicators of the quality and attributes of the system, such as timeliness and completeness of reporting

(c) identifying problems in the system in order to institute corrective measures in a timely manner

(d) ensuring that all implementers of the system are held responsible and accountable for their defined activities

(e) ensuring that stakeholders can receive information on performance of the surveillance system.

Some benefits of evaluating the surveillance system are:

(a) ensuring that the surveillance system meets the objectives for which it was formulated
(b) documenting surveillance system status and change in performance
(c) providing evidence, based on which surveillance objectives, implementation strategy and planned activities can be modified
(d) enabling planning of resource allocation
(e) providing explanations for achievements and failures in the system
(f) providing specific recommendations for improving the system.

Some benefits of providing feedback after supervision are:

(a) reinforcing health workers' efforts to participate in the surveillance system
(b) motivating those who provided data, hence scaling up compliance for reporting
(c) improving quality of data provided by data collectors
(d) enhancing planned public health action
(e) complementing planning of appropriate actions
(f) strengthening communication and spirit of team work.

Chapter 3 of these guidelines describes how, each month, health workers responsible for surveillance at health facility and LGA levels review and analyze data that is reported during the month. Conclusions are drawn about the following:

(a) timeliness and completeness of reporting from each level
(b) quality of routine prevention and control activities taking place, so that when problems are detected, LGAs respond with appropriate action.

The same information can also be used during supervision to routinely monitor, and annually evaluate:

(a) timeliness in reporting immediately notifiable diseases, conditions or events
(b) outbreak investigations and responses
(c) reporting of summary data on a routine basis.

When problems are detected in the surveillance and response system, action can be taken to strengthen it. By providing feedback to health workers for implementing identified corrections, it is more likely that results of desired outcomes will be evident. For example, one may use the monthly monitoring data to do an evaluation at the end of the year, and questions to help carry out an evaluation may include:

(a) Are surveillance objectives for existing activities being met?
(b) Were surveillance data used for taking public health action?
(c) Did surveillance, laboratory and response activities have an impact on the outcome of health events in the LGA?

8.1 Identify Targets and Indicators

Using indicators is helpful in measuring the extent of achievement for a particular programme or activity. Indicators are signs of progress — they are used to determine whether the programme/intervention is on the way to achieving its objectives and goal. This achievement is then compared to overall recommended performance standards. Apart from performance standards, there are some disease-specific surveillance indicators that may be used to monitor quality of the surveillance system, e.g. those for AFP and measles.

Indicators are also used to assess performance of the surveillance system, to ascertain whether it is reaching its targets and objectives. For example, LGA may have a goal of reaching 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, quality of a given service or activity.

8.1.1 Use Indicators in Accordance With National Goals and Specific Plans

Use indicators according to national goals and specific plans to improve integrated disease surveillance and response activities at the LGA level. Select indicators that are specific to the LGA's plan for improving surveillance in the current year, and that will provide information the LGA can use.

8.1.2 Select Data for Measuring Indicators

After selecting relevant indicators, specify the numerator and the denominator. For example, if the LGA's 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 total number of health facilities in the LGA.

8.1.3 Ensure Availability of Data Sources

Each level should make sure that the level it supervises has the following sources of data available. For example, the national level has data available from State and LGA levels to conduct required monitoring activities.

Data source	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			
IDSR forms/Case-based and/or line listing reporting forms	X	X	X	X
Outbreak investigation report	X	X	X	X
Log of suspected out-breaks and rumours	X	X	X	X
Supervisory reports from LGA and/or states	X	X	X	X
Laboratory reports received	**X**	**X**	**X**	**X**

Table 8.1: Types of sources of data at various levels

8.2 Monitor Core Functions for IDSR at LGA level

Indicators for core functions measure processes and outputs from the surveillance system. In the introductory section, core surveillance functions have been described and so one may refer to the table of core surveillance functions for each level. This subsection in chapter 8, describes key indicators at various levels, in relation to core functions. Here, core functions are briefly described, but further detail of said functions is provided in Annex 8A, where indicators for each core function are available.

The core functions are:

(a) Identifying Cases and Public Health Events

(i) Case detection is the process of identifying cases and outbreaks. Case detection may be done through the formal health system, private health systems or community structures. Case definitions and a functioning signal-verification system are vital for case and outbreak detection. Once a case has been identified, it has to be recorded in a register (outpatient or inpatient register, clinical cases register, Electronic Medical Records, etc.). At the health facilities, health workers use any of these registers to extract the IDSR priority diseases.

(ii) Monitoring indicators should monitor this core surveillance function. Examples of indicators include:

- Proportion of health facilities that have standardised registers for recording diseases. Further assessment could also be done to examine the validity and quality of information recorded as well as factors that affect registration.
- Proportion of health facilities using standard case definitions (SCD) to identify IDSR priority diseases of cases.

(b) Report Cases and Events

(i) Reporting refers to the process by which surveillance data move through the surveillance system from the point of generation to the next level.

(ii) It also refers to the process of giving account of suspected and confirmed outbreaks as well as notifying under the IHR (2005) of PHEIC, using the decision instrument (see chapter 2).

(iii) There may be different reporting systems, depending on the type of data and information being reported, purpose and urgency of relaying data/information, and where the latter is being reported.

(iv) Timely submission of data is critical for prompt outbreak detection and response to prevent widespread outbreaks. Health facilities should, therefore, strive to submit reports on time, as prescribed in national guidelines.

(v) Examples of indicators for this core surveillance function include:

- Proportion of surveillance reports submitted on time to the LGA
- Proportion of cases of priority diseases of immediate case-based reporting that were reported within 24 hours

(c) Analyse and Interpret Data

(i) Analysing data is the systematic process of examining data to generate relevant information for timely and appropriate public health action to be taken

(ii) Surveillance data should be analysed routinely and the information interpreted for use in public health actions

(iii) Capacity for routine data analysis and interpretation should be established and maintained for epidemiological and laboratory data

(iv) Examples of indicators which can be used to monitor analysis include:

- Proportion of priority diseases for which a current line graph is available.
- Proportion of LGAs that report laboratory data for priority diseases

(d) Investigate and Confirm Suspected Cases/Outbreaks

(i) Case/outbreak confirmation depends on the epidemiological and laboratory capacity for confirmation

(ii) Capacity for case confirmation is enhanced through improved referral systems, networking and partnerships. This implies having the capacity for appropriate specimen collection, packaging and transportation.

(iii) Internal and external quality-control mechanisms are important elements for case confirmation; they help to ensure the validity and reliability of test results.

(iv) Examples of indicators for monitoring this core function include: Proportion of suspected outbreaks of epidemic prone diseases and other PHE events notified to the LGA level within 24 hours of surpassing the epidemic threshold

Proportion of investigated outbreaks of epidemic prone diseases with laboratory result within 7days.

(e) Prepare

(i) Epidemic preparedness refers to the existing level of preparedness for potential epidemics and includes availability of preparedness plans, stockpiling, designation of isolation facilities, and setting aside resources for outbreak response.

(ii) Examples of indicators which can be used to monitor preparedness include:

- Proportion of health facilities that have contingency stocks for 3–6 months. Proportion of LGAs with emergency preparedness and response plans

(f) Respond

(i) Public health surveillance systems are only useful if they provide data for appropriate public health response and control. For an early warning system, the capacity to respond to detected outbreaks and emerging public health threats needs to be assessed. This can be done following a major outbreak response and containment, to document the quality and impact of public health response and control.

(ii) Some examples of indicators for monitoring response include:

- Proportion of LGAs with functional multisectoral emergency public health preparedness and response committees.
- Proportion of LGAs with functional public health emergency rapid response teams (PHERRT).
- Case-fatality rate for the epidemic-prone disease reported.

(g) Provide Feedback

(i) Feedback is a process in which the effect or output of an action is returned (fed back) to modify the next action. It is an important function of all surveillance systems. See subsection 8.5.2 of this chapter provides a thorough description of types of feedback which may be used to improve performance of IDSR.

(ii) Some examples of indicators for feedback include:

- Availability of epidemiological bulletin/newsletters/briefs summaries at the State level Proportion of states that receive feedback from the national
- Proportion of health facilities that received IDSR technical support supervision visit in a given period.

While all indicators for the IDSR core functions are important, the WHO Regional Office for Africa will measure overall performance of core functions of IDSR in the countries, using 14 key performance indicators described in Annex 8J.

8.3 Monitor Quality of IDSR Activities at LGA Level

The quality of the surveillance system is defined by attributes such as:

(a) Completeness
(b) Timeliness
(c) Usefulness
(d) Sensitivity
(e) Positive predictive value (PPV)
(f) Specificity
(g) Representativeness
(h) Simplicity
(i) Fexibility
(j) Acceptability
(k) Reliability
(l) Accuracy.

Periodically, quality of the surveillance system should be assessed, based on these indicators.

Surveillance attributes can be evaluated using quantitative and qualitative methods. Some tools that may be used to comprehensively evaluate surveillance systems include:) updated guidelines for evaluating public health surveillance systems, produced by the United States Centers for Disease Control and Prevention (CDC); and the framework for evaluating public health surveillance systems for early detection of outbreaks (CDC, 2001). Nigeria engages the Nigeria Field Epidemiology and Laboratory Training Programme (NFELTP) residents to assist in evaluating the surveillance and response systems of IDSR and other disease surveillance systems.

8.3.1 Monitor Timeliness and Completeness of Reporting

An important indicator of a good-quality reporting system is the timeliness and completeness of reporting at each level. If reports are sent and received on time, the feasibility of detecting a problem and conducting prompt and effective response is greater. If, however, reports are incomplete, then

the information cannot describe the problem, and if they are late, or not submitted at all, aggregated information for a given LGA (or any other administrative area) will not be accurate. In such an event, outbreaks can go undetected, and other opportunities to respond to public health problems will be missed.

8.3.1.1 Timeliness

The single most important measure of timeliness is whether data are submitted in good time to begin investigations and implement control measures. Timeliness of reporting should be measured against standards developed by each country, in accordance with timelines set by the WHO Regional Office for Africa. Important aspects of timelines of reporting in a communicable disease surveillance system include:

- timeliness of immediate notification, i.e. within 24 hours
- timeliness of weekly reporting
- timeliness of monthly reporting

(a) Monitor Detection and Notification of Immediately Reportable Diseases Or Events.

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

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

(b) Timeliness of Weekly and Monthly Reporting

If dates on which reports are received are routinely recorded and reviewed, system effectiveness can easily be assessed each month in the course of analysing routine and case-based data. A monitoring tool, such as the one in Annex 8G, may be used to monitor timeliness in the LGA. For example, use the record of reports received to:

- measure how many reporting units submitted reports for a given week/month against the number of units expected to report
- identify which reporting units have reported
- measure how many monthly reports were timely.

Ensure deadlines are given for each level to enable effective monitoring.

8.3.1.2 Completeness

Completeness in surveillance can have varying dimensions and may include the following:

(a) Completeness of Reporting Sites Submitting Surveillance Forms:

Completeness of reporting sites refers to the proportion of reporting sites that submitted a surveillance report, irrespective of the time that report was submitted. Computing completeness of reporting sites for each of the surveillance reports can:

(i) provide a trend analysis on completeness of reporting for each of the surveillance reports over a period of time; and assist in identifying how each site is performing

(ii) in addition, trigger further investigation for reasons of poor performance, and possibly help to identify solutions to correct such performance.

(b) Completeness of Case Reporting

Completeness of case reporting refers to the match between the number of cases reported and the actual number of cases. This can be obtained by comparing the number of notifiable conditions reported to the next higher level (over a period of time), with the number of cases recorded in the patient register, over the same period.

(c) Completeness of Surveillance Data

Completeness of surveillance data is the match between the expected data requirement and what is reported. The following questions are useful in determining completeness of surveillance data and its implications on public health actions:

(i) Are all data on each of the required variables in a surveillance form collected, registered, validated and compiled?

(ii) If not, which variables are not routinely collected, and what problems are encountered in their collection?

(iii) What is the implication of missing data on the quality of surveillance data?

(iv) How can this problem be resolved?

8.3.1.3 Identify Problems and Take Action

If monitoring information shows that a health facility or any other reporting unit has not provided a report, or if the report is not on time, the surveillance focal point at the facility should be contacted. 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 is available). Explain to the facility staff the benefits of collecting good-quality data and reporting it in good time. This can help them, for instance, to detect outbreaks, improve forecasting of medicines and supplies, and improve overall health facility management.

Additionally, ask if a new staff person has started working at the facility, and is yet to receive orientation on the procedure for reporting; or find out if health facility staff receive feedback about case reports they have generated, and if there are resources available for taking action in response to the information obtained.

Make plans with the reporting unit to find solutions for improving the situation. Explain that, when information is complete, the LGA can assist health workers 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.

8.3.1.4 Report Timeliness and Completeness to Other Levels

When routine reports or line-listed records of the number of cases are being sent to the State or national level, include also necessary data for timeliness and completeness. This will help the other levels to understand the situation much more clearly, and to evaluate quality of the data that is being sent. For example, if the report to the national level states that two

cases of measles were detected during the month, it should also include information about the number of health facilities that have 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.

8.3.2 Monitor other attributes for assessing quality of the IDSR system

Some other key attributes are summarised in the table below and can be used to assess quality of surveillance systems during periodic evaluation assessments (Table 8.2).

Attribute	Definition	Examples of some questions to assist in assessment
Usefulness	Describes if the surveillance system has been able to contribute to the prevention and control initiatives or has been useful in contributing to performance measures e.g. Usefulness of surveillance data in an early warning system	Is the system e.g. the early warning system able to detect outbreaks early? Example: A useful system, over time, must demonstrate that a certain intervention has been instituted and has worked effectively. In a malaria programme, data collected over time might show if Insecticide treated nets (ITN) has been useful in reducing incidences of malaria among children under five years
Simplicity	Simplicity refers to structure of the system and ease of its implementation from the end-user to those at higher levels.	Is the system simple? e.g. is the standard-case definition simple? Does it have multiple reporting structures? Example: A health worker has to report maybe to the LGA, as well as to another vertical programme if a disease is under that programme
Acceptability	Acceptability of a system is a reflection of the willingness of the surveillance staff to implement the system, and of the end-users to accept and use data generated through the system	How is the participation rate of surveillance sites? How is the degree of completeness of reports? Example: number of health facilities submitting reports on time
Representativeness	Representativeness refers to the degree to which reported cases reflect occurrence and distribution of all cases in the population under surveillance.	Is the system covering all geographical areas to ensure accurate capture of cases? NB: A good system should be able to cover all population, even those who are marginalized
Data quality	Data quality reflects completeness and validity of data recorded in the public health surveillance system.	For completeness one can examine the percentage of "unknown" or "blank" responses to items on surveillance forms NB: Validity depends on data quality. Error-prone systems and data prone to inaccurate measurement can negatively affect detection of unusual trends.

Table 8.2: Summary of other attributes for assessing quality of the surveillance system

For further information on the other unmentioned attributes above, please refer to Centers for Disease Control and Prevention (CDC) (2001). Updated guideline for evaluating public health surveillance systems. MMWR: 50 (RR-13); 1–35.

8.4 Monitor quality of surveillance activities at community level

Monitor Events from Community-based Surveillance (CBS)

Monitoring a CBS system is as equally important as monitoring health facility, LGAs and States. Community health workers, community focal persons and/or volunteers involved in the system must understand the benefit of the system, and know that their input is of value and can assist in improving or adapting the system to work better for the community.

Qualitative feedback from volunteers and the community is an essential part of contextualising and understanding quantitative CBS data. A system should be in place from the beginning to capture community and volunteers' feedback, and this may involve one or more of the following approaches:

(a) open and regular community meetings where all issues are noted and acted upon

(b) focus group discussions with volunteers and/or community leaders

(c) suggestions and complaints box (es) for use in the community

(d) appointment of a community representative(s) to gather feedback and complaints

(e) feedback platforms on mobile phones, which may be used by community volunteers to give feedback.

There should also be community-driven data analysis and monitoring, whereby communities are supported to undertake their own data analysis. Communities may be provided with basic material to record the type of occurrences they report, as well as resulting actions, and also record outbreaks or events that occurred but did not trigger an alert, so that triggers can be adjusted. Some performance indicators listed below (Table 8.3), are examples of indicators for community-based surveillance.

Number of alerts detected	**An alert is unofficial information about a disease, condition or event of public health importance which may be true or invented**	**Number of alerts detected from each CBS focal person**	**CBS reports**
Proportion of alerts responded to within 24hr–48hr	**Numerator:** number of alerts responded to on time. **Denominator:** Total number of alerts detected from CBS focal person NB: responding to alerts is defined as visit by the nearby health facility for case investigation, case management, health promotion, community sensitization and distribution of materials (must be defined according to response plan)	Number of alerts responded to within 24hr–48hr divided by total number of alerts reported	CBS reports and response reports
Proportion of alerts which are true events	Number of true events detected	Total number of true events detected divided by total number of alerts reported	CBS reports and response reports

Table 8.3: Examples of indicators for community-based surveillance

8.5 Supportive Supervision and Feedback for Improving IDSR Activities

8.5.1 Supportive Supervision

Supportive supervision is a process of helping to improve work performance. Supervision is not an inspection. Rather, good supportive supervision aims to sustain good-quality services, and not to find what is wrong with the latter.

In a good supportive supervision system, supervisors and health professionals work together to review progress, identify problems, decide what has caused the problem and develop feasible solutions.

(a) Ensure Availability of Job Descriptions and Standard Operating Procedures (SOPs) for Surveillance Staff

Job descriptions and SOPs are the basis for conducting supervision and assessing performance. Review job descriptions and SOPs of health workers who have a role in the surveillance and response system. Make sure that a job description states:

(i) the surveillance tasks to perform

(ii) to whom the health worker reports

(iii) a defined scope of work, as well as SOPs that are adhered to in practice.

(b) Prepare a Supervision Plan

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

(i) Decide how often to monitor health workers performance. For instance, the LGA may decide to conduct a supervisory visit at least 4 times in a year for each health facility. In some countries, depending on resources, supervisory visits take place more often (monthly, for example).

(ii) Ask health facility supervisors to make a schedule of supervision they intend to conduct over the next year in their own facilities, and in any community sites that report to the facility.

(iii) Make sure that transport is available for supervision and for surveillance activities that require transportation means. For example, coordinate travel or logistics for surveillance supervisory visits with visits made by other programmes or activities.

(iv) Include in the overall plan, other reporting sites in supervision of LGA surveillance activities, such as private health centres, other clinics (of schools, uniformed forces etc.), medical centres and community reporting sites.

(c) Use a Supervisory Checklist

Each health facility has unique problems and priorities that require specific problem solving and corrections. To maintain positive motivation of health facility staff for their efforts at ensuring improvement, consider developing a graduated checklist to guide the supervisory visit. The items listed in a graduated checklist (see Annex 8H) are some of the examples of achievements that a health facility can be evaluated on. Always refer to Annex (8 A–D) and look for additional examples to evaluate for each core surveillance function at the health facility level. For example, when the facility has achieved one objective (using standard-case definitions consistently, for instance), work with health facility staff to include the next indicator or item for monitoring performance, such as using thresholds for action. Revise the supervisory checklist accordingly. Use it during future visits to help health staff in monitoring their activities and progress towards an improved system.

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:

Identifying and Registering Cases: Check the health facility register to see if the case diagnoses correspond to the recommended case definition. Check the register to see if all columns are filled out correctly.

Confirming Cases: Compare laboratory records for priority diseases with the number of cases seen in the clinic for the same period of time. For example, compare the number of positive malaria slides with the reported number of hospitalized malaria cases.

Reporting: Ask to see copies of the most recent reports for the most recent reporting period. Compare the number of cases of priority diseases that were reported with the number recorded in the register. Check the date on which the case report was sent against the date recommended for sending the report. Check reports to make sure they are complete and accurate.

Reviewing and Analysing Data: Verify that trend lines are prepared and updated for priority diseases. Ask to see the "Health Facility Analysis Book," or the electronic health facility data 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 PPEs to be sure there is adequate supply.

Note: A sample supervisory checklist for health facilities is in Annex 8H at the end of this chapter. Additionally, Annex 8A, describes details of core surveillance functions at health facility level and can be used for guidance in supervision of the health facility. Questions to be answered during a supervisory visit may be adapted or modified to meet specific concerns, and determine the extent of progress towards an integrated surveillance system within a health facility.

(d) Conducting Supervisory Visits

Conduct regularly-scheduled supervision at all levels (national to states; states to LGAs; LGAs to facilities; facility to community) to ensure:

(i) appropriate supplies (e.g. forms, job aids) and required standard-case definitions/ guidelines are available

(ii) public health staff know how to identify and use standard-case definitions to record suspected cases of priority diseases seen in their health facility

(iii) priority diseases are recorded in the case register, according to the case definition

(iv) some data are analysed 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)

(v) reported cases of diseases, conditions, or events for which a single case is a suspected outbreak or public health emergency, are investigated promptly (for example a single confirmed case of cholera with evidence of transmission, or polio, Lassa fever, MDR/XDR TB)

(vi) response takes place when outbreaks or other public health events are confirmed, or when problems are identified in routine reporting

(vii) response actions are monitored and action is taken by the health facility to improve surveillance and readiness for outbreak response.

Make Sure During the Visit to:

(i) Provide feedback to health workers. Let them know what is working effectively and what is not. Also give feedback on how previously reported data was used to detect outbreaks and take action to reduce illness, mortality and disability in the LGA. If improvements are needed, discuss solutions with staff

(ii) Provide on-the-job training as needed, if a problem is identified. For example, during review of the analysis workbook, the supervisor noted that case-fatality rates were not correctly calculated. The supervisor meets with the health workers who are responsible for data analysis, and reviews steps for calculating the rate with the staff in question

(iii) Follow up on any request for assistance, such as for emergency response equipment or supplies

(iv) If solution to a pre-existing problem was identified during 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

(v) Ensure that both supervisor and supervisee(s) sign the supervision reports and also provide dates on which supervision was done.

(e) Writing a Report on Supervisory Visit

Include in the report, achievements that were identified during the visit; also, state follow up actions that were planned with the health workers, and any requests for additional resources, funds or special problems.

(f) Using Supervisory Visits to Improve Surveillance Activities in the LGA

Visits of surveillance supervisors and State disease control programmes are good opportunities to discuss and improve disease control in the LGA. For instance, if a national malaria control person visits the LGA, the reason why inpatient malaria deaths have not been declining could be discussed with them. Questions may also be asked about additional ideas or resources that the malaria control programme could provide.

8.5.2 Feedback

In most cases, health facilities and LGAs reliably report surveillance data to the next level as required. When LGA or State or national managers receive data, they should respond to health facilities that provided them. The purpose of feedback is to reinforce health workers' efforts at participating in the surveillance system. Another purpose is to raise awareness about certain diseases and any achievements made by disease-control and prevention projects in the area. Feedback is classified as supportive when it reinforces and acknowledges good performance, and corrective, when a change in behaviour and improvement is required. It also strengthens the communication and spirit of team working. Feedback should be both vertical and horizontal targeting different audiences as provided by different levels in the health system. Effective feedback should be:

(a) specific to ensure that recipients understand the subject of the feedback

(b) based on the report submitted or the actual events and activities observed in the field

(c) given as soon as feasible, after receiving the report or field visit, so that recipients will remember activities that should be sustained or corrected.

If the facility does not receive information from the next level about how data were used or what data meant, health workers may think that their reporting is not important. As a result, future reporting may not be reliable, since health workers will not know whether the information they sent to other levels was important or necessary. Their understanding of the health situation may be good at their own level, but they may not have the needed information for characterizing the situation at LGA or State level. At community level, communication includes building relationships, communicating and coordinating with other community key informants, resource persons and existing formal and informal networks for information dissemination and reporting.

Feedback may be written, such as a monthly newsletter/bulletin, emails, WhatsApp, SMS or periodic official information like publications, or it may be given verbally through telephone calls or periodic meetings. Although this section focuses on LGA-level feedback, this can also be applied at health facility and national levels. Feedback may also be given during supportive supervision, by the LGA to health facilities, or by the State to LGAs or by the national level to LGAs and states. Supervision can be on performance of health programmes and feedback can be provided during such supervisory visits.

(a) Developing and Disseminating Routine Epidemiological Bulletins

Feedback should also be given periodically of IDSR reportable diseases, and this can be done through weekly, monthly or quarterly epidemiological bulletins. Bulletins provide information on disease patterns and achievement of programme objectives in the country. They are usually brief and are important for reaching policy-makers, legislators, development partners, programme technical staff and stakeholders. As a minimum, they contain:

(i) a summary table with the number of reported cases and deaths, to date, for each priority disease

(ii) a commentary or message on a given disease or topic

(iii) any relevant social, economic or cultural information or data on the context that can lead to creating real intelligence regarding an event.

Annex 8I shows examples of an epidemiological bulletin.

(b) Developing 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:

(i) At a staff meeting, or during a supervisory visit, give a verbal report or comment about data that were reported by the health facility during a given period.

(ii) Display data in a simple table. Sit with health workers and show them the data. Talk together about the likely conclusions that may be drawn from said data. Consider conclusions not only for the health facility, but also for the LGA as a whole.

(iii) Prepare a single sheet with a simple table that shows how data reported for a given period are different from data reported for some other period or target population. For instance, show the number of cases of diarrhoea with dehydration in children aged less than 5 years, from the same period last year, and compare them with a corresponding period in the current year, after a safe water project was implemented in a high-risk area, for example. Use summary sheets to support requests made to higher levels for additional funds, supplies and resources.

(c) Developing LGA newsletters

The purpose of a LGA 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 workers. The target audience for a newsletter could be health workers in the LGA. The newsletter may be 2 to 4 pages long, and produced simply with a computer entered or typewritten text.

Examples of articles that could be carried in a newsletter are:

(i) summary of national or LGA data for a given priority disease

(ii) report of progress towards a specific public health target

(iii) report of specific achievements towards public health by an individual health worker or a group of health workers

(iv) description of special events or activities (for example, a change in market day).

8.6 Evaluate Effectiveness of Performance of The IDSR System

The purpose of evaluating a surveillance system is to assess its effectiveness and response system in terms of timeliness, quality of data, preparedness, case management, overall performance and using indicators to identify gaps or areas that could be strengthened. A comprehensive evaluation should thus include the surveillance system and, if already available, the IDSR Implementation Plan. Evaluation of the surveillance system should:

(a) Show the extent to which desired outputs and outcomes are achieved

(b) Provide explanations for achievements, disparities and failures

(c) Document quality of the system and demonstrate any changes in its performance

(d) Demonstrate the extent to which overall surveillance objectives are achieved.

Depending on the development status of surveillance in a LGA, select evaluation indicators that will provide information relating to LGA's priorities and objectives for the year.

If there is already an IDSR implementation plan, with clearly defined objectives, then it is appropriate to conduct mid-term and end-of-term evaluations. Otherwise, surveillance systems should be evaluated every 2, 3 or 5 years.

Key steps in evaluation include:

Defining Objectives: Objectives should be simple, measurable, attainable, realistic, and time-bound (SMART).

Developing Evaluation Indicators: Indicators should be identified for each of the evaluation objectives, and should be harmonised, as much as possible, with monitoring indicators.

Developing Evaluation Methods and Tools: Based on these indicators, an evaluation protocol should be developed describing the evaluation process, methods, target group, data sources, data collection methods, and plan for data analysis and utilisation.

Identifying People to Conduct Evaluation:

(a) Determine who evaluators will be; people within the LGAs, people outside the LGA, or a mixture of people including partners/donors. Depending on the scope of evaluation, its purpose and available resources, a decision should be made during the planning stage on who should undertake evaluation.

(b) To ensure objectivity and transparency during the evaluation process, a blend of self-internal evaluations and external evaluations should be conducted periodically.

Conducting the Evaluation

8.6.1 Compiling and Organizing Monitoring Data and Other Results

The LGA health office should summarize surveillance data received from all health facilities in the catchment area, and submit a compiled report to the state or national level as appropriate. Report submission should not be delayed due to late reports from some health facilities; promptly submit all reports received. Late reports should be submitted as they arrive. Follow up with health facilities who do not report or who consistently provide late reports.

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

The State public health department/epidemiology unit should compile surveillance data received from all LGAs in the states, and submit the report to national level. The states should compile and submit available reports on time. Late reports may be sent separately when they are received.

The national level should compile surveillance data received from all states, and also look for epidemics that were not identified by LGAs. Follow up with areas where reporting continues to be unreliable or does not happen at all. Support states in providing assistance to LGAs when they evaluate measurements, and take action to improve the situation. Provide feedback to each and every level about national, State, LGA and health facility levels.

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

Gather data from several sources. For example:

(a) Review objectives for the year listed in the LGA's annual plan for improving surveillance and response.

(b) Gather monthly summaries of cases and deaths reported to the LGA, spot maps, and other analysis results performed by the LGA.

(c) Collect any results from special surveys or studies that were done in the LGA over the previous year.

(d) Include case investigation forms and reports of outbreak response activities that took place in the LGA.

(e) Gather summary information from the community and also from health workers.

8.6.2 Analyse Data

As summary data for the year are evaluated, some issues to make decisions on are as follows:

(a) Were the reports complete, on time and accurate?

(b) What were significant changes in disease or event trends during the year? If an increase occurred, was the problem identified?

(c) If additional cases are still occurring, why are they occurring? Where are they occurring?

(d) Were appropriate and timely actions taken in response to the surveillance data?

(e) Were supervisory visits conducted as planned and follow-up tasks carried out as planned?

(f) Did the community feel that response activities were successful?

(g) Were any actions taken to address health workers requests or suggestions about services or surveillance?

(h) Were appropriate measures taken to prevent similar events?

8.7.3 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 facility staff to find out possible causes of the problem.

8.6.4 Update Plans for Improving the IDSR System

Include in the LGA plan, successful activities that should continue. Also, include feasible solutions selected as a result of analysis of the year's annual evaluation. Plan to implement the solution. For example:

(a) State the new activity and its objectives

(b) Specify personnel who will carry out the activity

(c) Estimate the cost of the activity (if any)

(d) Develop a timetable for the activity. Define the sequence of activities in logical order.

(e) Specify logistics for the new activity (equipment, personnel, transportation, resource allocation).

8.6.5 Provide Feedback to Health Facilities About the Evaluation

Provide a report and give feedback to health facilities and others in the LGA about results of the evaluation activity. State in the feedback report:

(a) what the objectives were for the year

(b) what was actually achieved

(c) what the likely reasons were for any differences between what was planned and what was achieved

(d) recommended solutions and prioritised activities for improving surveillance and response in the LGA.

8.7 Annexes to Chapter 8

Annex 8A	IDSR core surveillance indicators and monitoring indicators for health facility, LGA, State and National level
Annex 8B	Monitoring chart for performance of IDSR indicators at health facility level
Annex 8C	Monitoring chart for performance of IDSR indicators at LGA and State level
Annex 8D	Sample form for recording timeliness and completeness of monthly reporting from health facility to LGA level
Annex 8E	Checklist for supervising surveillance and response activities at health facility
Annex 8F	Sample weekly and monthly public health bulletin
Annex 8H	Indicators for monitoring performance of IDSR core functions

Annex 8A: IDSR Core Surveillance Indicators for Health Facility, LGA, State and National Level

IDSR Core Function	Theme	Indicator			
		National	State	LGA	Health facility
Identify	Availability of IDSR guidelines	NA	NA	Proportion of health facilities with Standard-case definition (SCD)	Availability of Standard-case definition (SCD)
		Proportions of states with IDSR guidelines to identify cases	Proportions of LGAs with IDSR guidelines to guide identification of cases	Proportion of HFs with IDSR guidelines	Availability of IDSR guidelines/extract
			NA	Proportion of health facilities with standardized registers and IDSR forms	Availability of IDSR forms (001A, B &C; 002; 003; rumour log)
		NA	NA	Proportion of HFs with NHMIS registers	Availability of NHMIS registers (In/outpatient and for other diseases)
	EBS	Proportion of states reporting information using EBS	Proportion of LGAs reporting information using EBS	Proportion of health facilities reporting information using EBS	Number of events recorded in EBS log within the reporting period
Reporting	IDSR timeliness and completeness	Proportion of cases of priority diseases of immediate case-based reporting that were reported within 24 hours by the state	Proportion of cases of priority diseases of immediate case-based reporting that were reported within 4 hours by LGAs	Proportion of cases of priority diseases of immediate case-based reporting that were reported within24 hours by health facilities	Number of cases of priority diseases for immediate case-based reporting that were reported within24 hours by health facilities
		Proportion of States that submitted IDSR 002 report on time	Proportion of LGAs that submitted IDSR 002 report on time	Proportion of health facilities submitting IDSR 002 reports on time to the LGA	Number of IDSR 002 reports submitted on time to the LGA
		Proportion of States that submitted monthly IDSR (003) in the last three months	Proportion of LGAs that submitted monthly IDSR (003) in the last months	Proportion of HFs that submitted monthly IDSR (003) in the last months	Number of IDSR 003 reports submitted on time to the LGA in last three months
		Proportion of surveillance reports submitted to the NCDC in last three months	Proportion of surveillance reports submitted to the state	Proportion of surveillance reports submitted to the LGA.	Number of surveillance reports submitted to the LGA within reporting period
Analysis and Interpretation	Analysis	Proportion of the priority diseases for which a current line graph, epi curve are available at NCDC	Proportion of the priority diseases for which a current line graph is available at States	Proportion of the priority diseases for which a current line graph is available at LGAs.	Proportion of priority diseases for which a current line graph is available.
		Availability of the spot maps for epidemic prone diseases at the NCDC	Availability of the spot maps for epidemic prone diseases at the States	Availability of the spot maps for epidemic prone diseases at the LGAs	Proportion of priority diseases for which an updated spot map is available.
		Proportion of States that report Lab data for priority diseases	Proportion of LGAs that report Lab data for priority diseases	Proportion of health facilities that have priority diseases for which there is current lab data	Proportion of priority diseases with laboratory data
		Proportion of designated lab reporting analysed lab data to the national lab.	NA	NA	NA

Annex 8A: IDSR Core Surveillance Indicators for Health Facility, LGA, State and National Level

Investigation and confirmation of suspected outbreaks	Outbreak notification	Proportion of suspected outbreaks of diseases notified to the level within 48hours of surpassing the alert threshold	Proportion of suspected outbreaks of epidemic-prone diseases notified to the national level within 24 hours of surpassing the epidemic threshold	Proportion of suspected outbreaks of epidemic-prone diseases notified to the state within 24 hours of surpassing the epidemic threshold	Proportion of suspected outbreaks of epidemic prone diseases and other PHE events notified to the LGA level within 24 hours of surpassing the epidemic threshold
		The number of outbreaks detected at national level that were missed by the states.	Number of outbreaks detected at State level that were not reported by LGAs	NA	NA
	Analysis with case-based data	Proportion of report of investigated outbreaks that include analysed case-based data	Proportion of report of investigated outbreaks that include analysed case-based data	Proportion of report of investigated outbreaks that include analysed case-based data.	NA
	Lab testing	Proportion of investigated outbreaks of epidemic prone diseases with laboratory result within 7days	Proportion of investigated outbreaks of epidemic prone diseases with laboratory result within 7days	Proportion of investigated outbreaks of epidemic prone diseases with laboratory result within 7days	Proportion of samples of suspected cases whose Lab reports are returned within 72 hours
		NA	NA	Proportion of samples transported to the designated lab with 48 hours	Proportion of specimens transported to the lab within 48 hours of collection
	PH response	Proportion of confirmed outbreaks with a nationally recommended public health response (see checklist}	Proportion of confirmed outbreaks with a nationally recommended public health response (see checklist}	Proportion of confirmed outbreaks with a nationally recommended public health response (see checklist)	NA
Preparing		Presence of a functional coordination PHEMC (PH EOC) at national level	Presence of a functional coordination at PHEMC (EOC) at state level	Presence of a functional central unit for coordination of PHEMC/ EOC (at the LGA level	NA
		Availability of national Emergency Preparedness and Response Plan	Availability of state Emergency Preparedness and Response Plan	Availability of LGA Emergency Preparedness and Response Plan	Availability of all hazards' emergency preparedness and response plan
		Proportion of states with emergency preparedness and response (EPR) plans	Proportion of LGAs with emergency preparedness and response plans	Proportion of health facilities with emergency preparedness and response (EPR) plans	NA
	Coordination	Proportion of states with public health risks and resources mapped	Proportion of LGAs with Public health risk and resource mapping	NA	NA
	Funding	Proportion of States with funds for emergency preparedness and response	Proportion of LGAs with funds for emergency preparedness and response (or budget line for emergency funds)	Existence of funds for emergency response (or budget line for emergency funds)	NA
		Proportion of States that have contingency stocks, including lab supplies for 3–6 months	Proportion of LGAs that have contingency stocks for 3–6 months See checklist of critical emergency medical supplies	Proportion of health facilities that have contingency stocks for 3–6 months (See checklist of critical emergency medical supplies)	Availability of key supplies for emergency response (see checklist for critical medical supplies of priority disease and public events.)
	Supplies/Lab	NA	NA	Proportion of health facilities that experienced shortage of drugs and supplies for the most recent outbreak (see annex for minimum stock level)	NA

Annex 8A: IDSR Core Surveillance Indicators for Health Facility, LGA, State and National Level

Responding	PHEMC	Presence of a functional Public Health Emergency Management Committee at NCDC	Presence of a functional Public Health Emergency Management Committee at state level	Presence of a functional Public Health Emergency Management Committee at LGA level	Availability of a functional Public Health Emergency Management Committee (based on facility staffing) committee (based on facility staffing)
		Proportion of States with functional Public Health Emergency Management committee	Proportion of LGAs with functional Public Health Emergency Management Committee (PHEMC)	Proportion of HFs with functional public health emergency management committee	
	RRT	Proportion of states with functional PHERRT	Proportion of LGAs with functional public health emergency rapid response team (PHERRT)	Availability of public health emergency rapid response team (PHERRT)	NA
	Data Analysis	Attack rate for each outbreak of priority disease	Attack rate for each outbreak of priority disease	Attack rate for each outbreak of priority disease	Attack rate for each epidemic prone disease reported
		Case-fatality rate for each epidemic prone disease reported	Case-fatality rate for each epidemic-prone disease reported	Case-fatality rate for each epidemic- prone disease reported	Case fatality for each epidemic- prone disease reported
	Response	Proportion of outbreaks or any public health event responded to in the previous 12 months	Proportion of outbreaks or any public health event responded to in the previous 12 months	Proportion of outbreaks or any public health event responded to in the previous 12 months	NA
	IPC	Proportion of HFs with infection prevention and control (IPC) requirements	Proportion of hospitals with infection prevention and control (IPC) requirements (see checklist)	Proportion of hospitals with infection prevention and control (IPC) requirements established including isolation ward/ unit (see checklist)	Availability of IPC measures in the health facilities including a holding area (see checklist)
		NA	Proportion of HFs with isolation facility in the States	Proportion of HFs with isolation facility in the LGAs	Availability of an isolation facility in the hospital
		NA	NA	NA	Proportion of HCW trained in IPC in last 12 months at the facility
Feedback		Availability of weekly epidemiological bulletin/ newsletters/briefs summarising data on selected priority diseases	Availability of epidemiological bulletin/newsletters/ briefs summaries	NA	NA
		Availability of feedback reports	Availability of feedback reports	Availability of feedback reports/	Availability of feedback reports
		Proportion of states that receive feedback from the national	Proportion of LGAs that receive feedback from the states	Proportion of feedback reports sent to the HFs and community levels	Proportion of feedback reports received from the LGA level
		Proportion of States that receive IDSR technical support supervision visit in a given period	Proportion of LGAs that receive IDSR technical support supervision visit in a given period	Proportion of health facilities that receive IDSR technical support supervision visit in a given period	

Indicator Reference Sheet
IDSR Core Function: Identify
Name of Indicator: Proportion of states and LGAs with IDSR guidelines to identify cases
DESCRIPTION
Purpose: Is to correctly identify and filling cases/events
Numerator: Number of States/LGAs/HFs with IDSR guidelines
Denominator: Total number of states/LGAs/HFs
Unit of Measurement: Proportion/percent
Performance tracking level: State/LGAs/Facility
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Completed Supervisory Checklist
Frequency and Timing of Data: Quarterly Target:
Individuals Responsible for Providing Data: M&E Officers, DSNO
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Identify
Name of Indicator: Availability of standard case definition
DESCRIPTION
Purpose: Is to correctly identify and filling cases/events
Numerator: Number of facilities with standard case definition in the states
Denominator: Total number of all health facilities
Unit of Measure: **Target:** 100%
Performance tracking by: *States/*LGAs
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Completed Supervisory Checklist
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: M&E Officers, DSNO
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Identify
Name of Indicator: Proportion of facilities with standardized registers and IDSR form
DESCRIPTION
Purpose: Is to correctly identify cases/events
Numerator: number of health facilities with standardized registers and IDSR forms
Denominator: Total number of health facilities in the LGAs
Unit of Measure: Percent Target:100%
Performance tracking level: LGAs
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Completed Supervisory Checklist
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: M&E Officers, DSNO
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Identify
Name of Indicator: Availability of IDSR forms
DESCRIPTION
Purpose: Is to correctly identify cases/events
Numerator: Number of facility with IDSR forms
Denominator: Total number facilities within the LGA
Unit of Measure: Proportion/percent **Target:**100%
Performance tracking by: *LGAs*
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Completed Supervisory Checklist
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: LGA M&E Officers/DSNO officers
Individuals Responsible at NCDC: Program Manager for Surveillance
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Identify
Name of Indicator: Proportion of states and LGAs with IDSR guidelines to identify cases
DESCRIPTION
Purpose: Is to correctly identify cases/events
Numerator: Number of States/LGAs that have IDSR guidelines
Denominator: Total number of states/LGAs
Unit of Measure: Proportion/percent **Target:**100%
Performance tracking by: State/LGAs Level
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Completed Supervisory Checklist
Frequency and Timing of Data: weekly/monthly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager for surveillance
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Identify
Name of Indicator: Reporting information using EBS
DESCRIPTION
Purpose: To measure ability of the system to capture unusual events
Numerator: Number of States reporting information using events based surveillance methods
Denominator: Total number of states
Unit of Measure: percent **Target:**100%
Performance tracking by: State/LGA/facility
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Routine summary reports and Supervisory report
Frequency and Timing of Data: Annually
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager Surveillance
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Identify
Name of Indicator: Number of event recorded through EBS that were logged, verified, and confirmed within the reporting period.
DESCRIPTION
Purpose: Is to correctly identify and filling cases/events
Numerator: Number of confirmed events recorded using EBS within the reporting period
Denominator: Total number of events that occur during the reporting period
Unit of Measure: percent **Target:**100%
Performance tracking by: National/State/LGAs Level
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Case based report
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager Surveillance
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Identify
Name of Indicator: Proportion of cases of priority diseases selected for immediate case-based reporting that were reported within 48hours using IDSR 001
DESCRIPTION
Purpose: Is to measure ability of the system to capture unusual events
Numerator: Number of events/ case of selected priority diseases for immediate case based reporting reported within 48hours
Denominator: Total number of cases of selected priority diseases for immediate case based reporting that occur in the reporting period.
Unit of Measure: percent **Target:**100%
Performance tracking by: *National/* State/LGA /facility level
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Completed Supervisory Checklist
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Reporting
Name of Indicator: Proportion of IDSR report submitted on time within the reporting period
DESCRIPTION
Purpose: Is to measure practice of timely submission of surveillance data at all levels
Numerator: Number of surveillance data using IDSR 002 submitted on time within the reporting period
Denominator: Total number of IDSR report (cases/events) submitted for the reporting period
Unit of Measure: percent **Target:**100%
Performance tracking by: *National/* State/LGA/facility
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Monitoring chart; routine summary report
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: M&E Officers, DSNO
Individuals Responsible at NCDC: National DSNO
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Reporting
Name of Indicator: Proportion of IDSR 003 surveillance report submitted on time within the reporting period
DESCRIPTION
Purpose: Is to measure practice of timely submission of surveillance data from all levels
Numerator: Number of States that submitted IDSR 003 report on time to next level
Denominator: Total number of state
Unit of Measure: percent
Performance tracking by: State/LGAs/facility Level
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Monitoring chart; routine summary report
Frequency and Timing of Data: Monthly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager/DSNO
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Reporting
Name of Indicator: Proportion of cases of diseases selected for immediate case-based reporting that were reported by states/LGAS/facilities using specified reporting tools
DESCRIPTION
Purpose: To measure practice of timely submission of surveillance data to the next level
Numerator: Number of states that reported cases of diseases selected for immediate case-based reporting using specified tools
Denominator: Total number of states tools
Unit of Measure: percent **Target:**100%
Performance tracking by: State/LGAs Level/Facility
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Completed Supervisory Checklist
Frequency and Timing of Data: Monthly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Reporting
Name of Indicator: Proportion of states that report laboratory data for selected priority diseases
DESCRIPTION
Purpose: To measure practice of timely submission of surveillance data to the next level
Numerator: Number of state that report laboratory data for selected priority diseases
Denominator: Total number of states
Unit of Measure: percent **Target:**100%
Performance tracking by: State/LGA/facility Level
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Completed Supervisory Checklist
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Analysis and Interpretation
Name of Indicator: Proportion of States in which a current epidemic profile is available for selected priority diseases
DESCRIPTION
Purpose: To measure practice and capacity to analyse surveillance data
Numerator: Proportion of States with current epidemic profile for selected priority diseases
Denominator: Total number of states
Unit of Measure: Proportion/percent
Performance tracking level: State
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Supervisory report; Case based line listing reports
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

IDSR Core Function: Analysis and Interpretation
Name of Indicator: Proportion of health facilities in which current line graph is available for selected priority diseases
DESCRIPTION
Purpose: To measure practice and capacity to analyse surveillance data
Numerator: Number of health facilities with current line graph for selected priority disease
Denominator: Total number of facilities in the LGAs
Unit of Measure: percent
Performance tracking level: LGAs
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Supervisory reports; LGA analysis book
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Analysis and Interpretation
Name of Indicator: Proportion of priority diseases for which line graph, bar chart spot map etc are available within the reporting period
DESCRIPTION
Purpose: To measure practice and capacity to analyse surveillance data
Numerator: number of states/LGAs/Facilities that with priority disease analysis within the reporting period
Denominator: Total number of states/LGA/Facilities
Unit of Measure: Percent **Target:**100%
Performance tracking level: National/State/LGAs/facility
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Supervisory reports; analysis log books
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: M&E Officers/DSNO
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Investigation and Confirmation of suspected outbreaks
Name of Indicator: Proportion of suspected outbreaks of epidemic-prone diseases notified to the national level within 48hours of surpassing the alert threshold within the reporting period
DESCRIPTION
Purpose: To measure early detection and timely reporting of outbreak
Numerator: Number of suspected outbreaks of epidemic- prone diseases notified to the national within 24-48hours of surpassing the alert threshold
Denominator: Total number of suspected outbreaks of epidemic-prone diseases within the reporting period
Unit of Measure: Percent **Target:**100%
Performance tracking level: National/State/LGAs/facilities
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Completed Supervisory Checklist
Frequency and Timing of Data: Yearly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet

DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Investigation and Confirmation of suspected outbreaks
Name of Indicator: Proportion of outbreaks detected at national level that were not reported within the reporting period.
DESCRIPTION
Purpose: To measure early detection and timely reporting of outbreak
Numerator: Number of outbreaks detected and reported to the national level within the reporting period
Denominator: Total number of outbreaks detected at states/ LGAs level
Unit of Measure: Percent **Target:**100%
Performance tracking level: State/LGAs Level
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: States/LGAs log of suspected outbreaks and alerts
Frequency and Timing of Data: Yearly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Investigation and confirmation of suspected outbreak
Name of Indicator: Proportion of investigated outbreak for which descriptive analysis was done including for case-based data within the reporting period.
DESCRIPTION
Purpose: To measure early detection and timely reporting of outbreak
Numerator: number investigated outbreak for which descriptive analysis was done including for case-based data within the
Denominator: Total number of investigated outbreak in states/LGAs
Unit of Measure: Percent
Performance tracking level: State/LGAs Level
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Investigative report including epidemic curve map; person analysis table; line lists or case reporting forms
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers

Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Investigation and confirmation of suspected outbreaks
Name of Indicator: Proportion of investigated outbreaks where laboratory testing was performed and results were recorded.
DESCRIPTION
Purpose: Measures capacity of the laboratory to confirm and document the diagnosis and involvement of laboratory in the surveillance activities
Numerator: Number of investigated outbreaks with laboratory results
Denominator: Total Number of investigated outbreaks
Unit of Measure: Proportion/percent
Performance tracking level : National/State/LGA
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Outbreak investigation reports, Laboratory reports , Routine summary reports Log of outbreaks and rumours
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: Laboratory scientists
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Preparing
Name of Indicator: Proportion of /states with emergency preparedness and response (EPR) plans
DESCRIPTION
Purpose: Measures preparedness of the State
Numerator Number of / states with EPR plan
Denominator: Total number of states in Nigeria including the FCT
Unit of Measure: percent
Performance tracking by: National
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Completed Supervisory Checklist
Frequency and Timing of Data: Annually

Individuals Responsible for Providing Data: M&E Officers, DSNO
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Preparing
Name of Indicator: Proportion of States with funds for emergency preparedness and response
DESCRIPTION
Purpose: Measures preparedness of states
Numerator: Number of states with budgets/budget line
Denominator: Total number of states including the FCT
How to measure:
Unit of Measure: Percent
Performance tracking level: State
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Annual Approved budget, workplans
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: M&E Officers, DSNO
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Preparing
Name of Indicator: Proportion of States that have contingency stocks, including lab supplies for 3–6 months
DESCRIPTION
Purpose: Measures preparedness of states
Numerator: Number of states with contingency stocks
Denominator: Total number of states including the FCT
Unit of Measure: Proportion/percent **Target:**100%
Performance tracking by: National
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: State inventory, stock ledger

Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: LGA M&E Officers/DSNO officers
Individuals Responsible at NCDC: Program Manager for Surveillance
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Preparing
Name of Indicator: Proportion of State labs with performance reports of routine quality assurance
DESCRIPTION
Purpose: Measures capacity of preparedness
Numerator: Number of regional/provincial labs with performance of routine QA
Denominator: Number of regional/provincial labs
Unit of Measure: Proportion/percent
Performance tracking by: State
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Quality Assurance reports
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: DSNO officers
Individuals Responsible at NCDC: Program Manager for surveillance
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Responding
Name of Indicator: Presence of functional Public Health Emergency Management committee
DESCRIPTION
Purpose: Measures ability of states/Country to respond
Numerator: Number of States with functional Public Health Emergency Management committee
Denominator: Total number of states including the FCT
Unit of Measure: percent
Performance tracking by: State

PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Routine Supervisory report
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager Surveillance
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Reporting
Name of Indicator: Availability of functional PHERRT
DESCRIPTION
Purpose: Measures ability of State preparedness
Numerator: Number of states with functional public health emergency rapid response team
Denominator: Total number of events that occur during the reporting period
Unit of Measure: percent **Target:**100%
Performance tracking by: *National/*State/LGAs Level
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Supervisory reports
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager Surveillance
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Response
Name of Indicator: Proportion of outbreaks or any public health event responded to in the previous 12 months
DESCRIPTION
Purpose: Measures response to outbreaks
Numerator: Number of suspected outbreaks of epidemic-prone diseases responded to
Denominator: Total number of suspected outbreaks of epidemic-prone diseases/events
Unit of Measure: percent
Performance tracking by: *National/* State/LGA /facility level

PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Outbreak reports
Frequency and Timing of Data: Quarterly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Responding
Name of Indicator: Proportion of HFs with infection prevention and control (IPC) requirements
DESCRIPTION
Purpose: Measures practice and capacity of hospital to apply infection control measures
Numerator: Number of hospitals that reported having established infection prevention and control (IPC) requirements recorded
Denominator: Total number of hospitals in the country/State
Unit of Measure: percent
Performance tracking by: *National/* State/LGA
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Routine summary reports and supervisory reports
Frequency and Timing of Data: Annually (survey)
Individuals Responsible for Providing Data: M&E Officers, DSNO
Individuals Responsible at NCDC: National DSNO
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Feedback
Name of Indicator: Proportion of States producing weekly epidemiological bulletin/ newsletters/briefs summarizing data on selected priority diseases
DESCRIPTION
Purpose: Presence of a feedback mechanism
Numerator: Number of states with epi bulletin
Denominator: Total number of states including FCT
Unit of Measure: percent
Performance tracking by: State/LGAs/
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Supervision reports
Frequency and Timing of Data: Monthly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager/DSNO
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Indicator Reference Sheet
IDSR Core Function: Feedback
Name of Indicator: Proportion of states that receive feedback from the national
DESCRIPTION
Purpose:
Numerator: Number of states that receive feedback from the national
Denominator: Total number of states
Unit of Measure: percent
Performance tracking by: State
PLAN FOR DATA COLLECTION, COMPILATION, AND ANALYSIS
Data/Information Sources/Method: Completed Supervisory Checklist
Frequency and Timing of Data: Monthly
Individuals Responsible for Providing Data: M&E Officers, DSNO officers
Individuals Responsible at NCDC: Program Manager
Location of Data Storage: Electronic and Hard copies to be kept in the filling cabinet
DATA QUALITY ISSUES
Procedures for Future Data Quality Assessments: Supervisory visits, DQA
THIS SHEET LAST UPDATED ON:

Annex 8B: Monitoring Chart for 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, summarise and compile 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 a 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
Availability of SCD and IDSR forms/ registers												
Availability of IDSR forms (001A,B,C; 002, 003)												
Availability of registers (In/out patient and for other diseases)												
Existence of a mechanism to capture unusual or public health events from non-routine sources												
Proportion of complete surveillance reports submitted on time to the LGA												
Proportion of cases of diseases selected for case-based surveillance, which were reported to the LGA using case-based or line listing forms												
Proportion of priority diseases for which a current line graph is available												
Proportion of priority diseases for which there is current lab data analysis												
Availability of emergency preparedness and response plan Availability of supplies for specimen collection and transportation												
Availability of contingency stocks												

Annex 8B: Monitoring Chart for Performance of IDSR Indicators at Health Facility Level

Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Proportion of suspected outbreaks of epidemic prone diseases notified to the LGA level within 24 hours of crossing the epidemic threshold												
Proportion of samples from suspected outbreak timely transported for lab investigation												
Availability of a functional epidemic preparedness committee												
Case Fatality rate for each epidemic-prone disease reported												
Proportion of suspected outbreaks of epidemic-prone disease notified to the LGA level within 24 hours of crossing the epidemic threshold												
Availability of an isolation facility												
Attack rate for each epidemic- prone disease reported												
Availability of community feedback reports												
Proportion of feedback bulletins/ reports received from the next higher level												
Reply YES or NO to the folowing checklist items												
Were surveillance reports submitted on time?												
Are 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 LGA?												

ANNEX 8C: Monitoring Chart of IDSR Performance Indicators at LGA and State Levels

LGA/ States: _____Year: _____

Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Proportions of Health facilities with SCD												
Proportion of LGAs/ regions reporting information using EBS												
Proportion of health facilities within the LGA with standardized registers and IDSR forms												
Number of events recorded in the LGA log book for rumours												
Proportion of health facilities submitting IDSR reports on time to the LGA												
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.												
Proportion of hospitals submitting IDSR reports on time												
Proportion of priority diseases for which a current line graph is available												
Proportion of health facilities that have current trend analysis												
Proportion of health facilities that have current lab analysis data for priority diseases analysed												
Proportion of suspected outbreaks of epidemic-prone diseases notified to the regional/ provincial level within 24 hours or crossing the epidemic threshold												
Proportion of reports of investigated outbreaks that include analysed case-based data												
Proportion of investigated outbreaks with laboratory results												
Proportion of confirmed outbreaks with a nationally recommended public health response												

ANNEX 8C: Monitoring Chart of IDSR Performance Indicators at LGA and State Levels

Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Proportion of samples from suspected outbreaks timely transported to laboratory for investigation												
Presence of a functional central unit for coordination of PHEMC (PH EOC)												
Proportion of health facilities with emergency preparedness and response plans												
Availability of a LGA Emergency Preparedness and Response Plan												
Proportion of HF with a functional epidemic preparedness plan committee												
Availability of Public Health Emergency Rapid Response Team (PHERRT)												
Case-fatality rate for each epidemic-prone disease reported												
Attack rate for each outbreak of priority disease												
Proportion of outbreaks or any public health event responded to in time the previous 12 months												
Proportion of hospitals with isolation facilities												
Availability of feedback reports/letters/bulletin												
Proportion of feedback bulletins/reports sent to the lower level												

Note: *Please compute the actual percentage for each cell*

Annex 8D: Sample Form for Recording Timeliness and Completeness of Monthly Reporting From Health Facility to LGA Level

State: _____LGA: _____

Health Facility: _____Year: _____

Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	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 reports =100 * T / N												
Completeness of reporting =100 * (N-W) / N												

Legend

T = arrived on time

L = arrived late

NR=report not received

**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 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 8E: Checklist for Monitoring IDSR 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?		
Registering cases	1. Are diagnoses of cases of priority diseases recorded in the clinic register according to the standard-case definition?	Yes [ ] No[ ]	
Reporting	Do health staff use a standard-case definition to report the suspected cases and outbreaks? Do you record information about immediately notifiable diseases on a case form or line list?	Yes [ ] No [ ] Yes [ ] No [ ]	
Analysing and interpreting	Do you plot the number of cases and deaths for each priority disease on a graph? (Ask to see the health facility's analysis book. Check whether trend lines are up-to-date.) Do you plot distribution of cases on a map?	Yes [ ] No [ ] Yes [ ] No [ ]	
Investigating and confirming reported cases and outbreaks	1. If an epidemic-prone disease was suspected, was it reported immediately to the LGA office? 2. For cases of priority diseases needing laboratory tests seen since the last supervisory visit, how many had laboratory results? 3. Are appropriate supplies available or set aside for collecting laboratory specimens during an urgent situation? May I see the supplies?	Yes [ ] No [ ] Number of results obtained: Number of expected cases seen: Yes No	

Annex 8E: Checklist for Monitoring IDSR Activities at the Health Facility

ACTIVITY	SUPERVISORY QUESTION	ANSWER	COMMENT (What caused problem)
Responding	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~~ IDSR Surveillance focal person for this facility? 4. How often do you provide information and training in outbreak response to the staff of this facility?	Yes [ ] No [ ] Supplies seen Yes [ ] No [ ] Name: Designation : Training is done :	
Providing feedback	1. How often do you report information to the community? 2. Do you receive the latest bulletin from the (central, subnational) level?	Report it Yes [ ] No [ ]	
Evaluating and improving 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 prepared-ness	1. What precautions do 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 8F: Sample Weekly Public Health Bulletin

Nigeria Centre for Disease Control

Weekly Epidemiological Report

Week 45: 4th – 10th November, 2019

Highlight of the Week

Nigeria Conducts Mid-term Joint External Evaluation of International Health Regulations Capacities

In 2017, Nigeria voluntarily joined the list of countries to conduct the Joint External Evaluation (JEE) of International Health Regulations (IHR, 2005) capacities. To address the critical gaps identified following Nigeria's JEE, the Nigeria Centre for Disease Control (NCDC) as the IHR National Focal Point together with various Ministries, Departments and Agencies (MDAs), supported by partners, developed a National Action Plan for Health Security (NAPHS). The NAPHS is a five-year multi-sectoral and overarching strategic plan intended to provide clear roadmap for implementation of activities to address the JEE gaps.

Two years after the first JEE, relevant MDAs and partners whose functions are related to national health security identified the need to review progress made in the 19 technical areas as well as areas for prioritisation to meet the 2022 target set during the first JEE. To achieve this, a mid-term JEE was conducted from 18th -22nd November, 2019 using the World Health Organization (WHO) approved JEE 2.0 tool.

The process included an initial internal assessment by relevant MDAs and an external validation by a mission Team which included representatives from partner organisations. The major outputs from the meeting were:

1. Review of activities in the 19 technical areas since the first JEE and progress made
2. Prioritised activities matched with resource needs for implementation
3. Improved collaboration and coordination among MDAs with functions related to national health security

The Honourable Minister of Health, Dr. Osagie Ehanire, received the results of the JEE from the mission Team. He highlighted the commitment and support from His Excellency, President Muhammadu Buhari for to strengthen national health security. While congratulating Nigeria on the successful review, the Officer in Charge of WHO Nigeria, Dr. Clement Peter-Lawson, attributed significant progress recorded to strong

What Constitutes Response Standards Within 24 To 48 Hours

1. Conduct initial rapid assessment/situation analysis
2. Inform NCDC of the outbreak/public health event
3. Activate country emergency response structures and assign critical functions
4. Initiate response activities using a pillar approach
5. Convene first multisectoral emergency coordination meeting
6. Develop an initial response strategy, objectives and action plan
7. Issue initial internal situation report (sitrep)

8.8 References

1. The IHR Review Committee on Second Extensions for Establishing National Public Health Capacities and on IHR Implementation (WHA 68/22 Add.1).
2. Community-Based Surveillance guiding principles March 2017(International Federation of Red Cross and Red Crescent Societies).
3. WHE-IDSR KPI results. June 2017.
4. Early detection, assessment and response to acute public health events: Implementation of Early Warning and Response with a focus on Event-Based Surveillance. WHO/HSE/GCR/LYO/2014.4.
5. Public Health Surveillance: A Tool for Targeting and Monitoring Interventions, Peter Nsubuga, Mark E. White, Stephen B. Thacker, Mark A. Anderson, Stephen B. Blount, Claire V. Broome, Tom M. Chiller, Victoria Espitia, Rubina Imtiaz, Dan Sosin, Donna F. Stroup, Robert V. Tauxe, Maya Vijayaraghavan, and Murray Trostle. Disease Control Priorities in Developing Countries. 2nd edition.
6. Communicable disease surveillance and response systems. A guide to planning. WHO/CDS/EPR/LYO/2006.1.

9.0 SORMAS (eIDSR)

Electronic IDSR (eIDSR) is the application of electronic tools to principles of IDSR to facilitate prevention, prediction, detection, reporting and response. It is based on:

a) Standardised interoperable and interconnected information systems administered within the national context

b) Rapid collection, analysis, reporting and use of disease/events data in real time for appropriate public health action.

In Nigeria, SORMAS has been adopted as the tool for eIDSR

9.1 eIDSR in the Context of Health Management Information System

Health Management Information Systems (HMIS) are used to facilitate routine collection of data to support planning, management and decision-making in health service provision. It routinely collects data about diseases, conditions and events, as well as other administrative and service-provision data. The primary source of these data is the health facility outpatient or inpatient register. The electronic platform of National Health Management Information System (NHMIS) is DHIS2 hosted at the Federal Ministry of Health.

In both NHMIS and eIDSR, primary sources of data are derived from health facility outpatient or inpatient registers and Electronic Medical Records (EMRs). The eIDSR is an enabling platform for reporting IDSR priority diseases in real time. In SORMAS which is the eIDSR platform, there is an active and timely means of collecting data on IDSR priority diseases and conditions which are extracted from either outpatient or inpatient registers, including patients' folders, and they are reported immediately, weekly or monthly.

9.2 Rationale of eIDSR

Limitations of the current approaches to IDSR data collection and transmission are attributed to the fact that states still use manual procedures and paper-based methods to collect and transmit data. The use of paper based methods is faced with delays in submission of reports and data quality issues, especially in the event of a suspected outbreak for prompt interventions.

SORMAS aims to facilitate the work of every staff member in a health system, by improving disease surveillance using electronic tools, hence strengthening surveillance and response capacities, while in the long term, reducing morbidity and mortality due to epidemic-prone diseases as well as other public health events.

9.3 Benefits of eIDSR

The SORMAS provides real-time information for immediate action. Potential benefits of SORMAS include:

(a) Early Alert and Detection: With SORMAS, the speed of outbreak detection can be improved, as information may be more rapidly captured, and in some cases, the time and place of an outbreak can be predicted with varying degrees of accuracy, thus enabling opportunities for prevention and control (Refer to a study done by CDC. 2008b. *Potential effects of electronic laboratory reporting on improving timeliness of infectious disease notification—Florida, 2002–2006. Morbidity and Mortality Weekly Report 57(49):1325–1328. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5749a2.htm)*

(b) Timely Reporting: SORMAS tools allow rapid and timely transmission of data from lower primary reporting units to the next higher level to enable appropriate public health action

(c) Standardisation of Data: Standardisation of tools in the SORMAS system enables data collection to be more consistent and complete for ease of data exchange and comparison across health facilities.

(d) Better Data Transmission and Management Including Storage:

(i) A major challenge of paper-based data is a need to compile reports from various sources and transmit reports to higher levels at regular intervals and to different administrative levels. Moreover, data storage and transport can be difficult, and there is a risk of data damage and loss.

(ii) With SORMAS there is faster data transmission; data are also organized into a format that is more accessible for interpretation and use.

(e) Interoperability and Sharing of Data: SORMAS provides an opportunity for exchange and use of information across sectors, especially if standards and workflow have been well developed for the eIDSR system to allow interoperability with other information systems.

(f) Automated Transmission, Analyses and Improved Data Quality:

(i) Paper-based reporting runs the risk of omitting valuable information when reporting to higher administrative levels.

(ii) SORMAS reduces data entry errors and facilitates automated data analysis, thus saving considerable effort for health workers.

(g) Ultimate Contribution Towards Good Response, Better Monitoring and Evaluation: SORMAS provides a platform for data storage and automatic analysis across health facilities for better monitoring and evaluation of various public health interventions.

(h) Cost Reduction: SORMAS makes for early detection of disease outbreaks, which in effect, can contribute to overall reduction of high costs associated with management of these outbreaks.

9.4 eIDSR Development and Implementation Process

The eIDSR system was developed in collaboration with relevant stakeholders at all levels to fit capabilities and needs of the country.

The most important considerations for the process of developing and implementing eIDSR are shown below:

9.4.1 Important Considerations for a Successful eIDSR

The following are the important considerations for successful implementation of SORMAS at all levels in Nigeria

(a) Laboratory Integration

(i) The system should be linked with laboratory data or have the ability to link to lab data in the future.

(b) Data Privacy and Use of a Unique Identifier (ID Number)

(ii) Data collection with patient identifiable data must go to a server with protections.

(iii) Access to data should be controlled through user-access rights.

(c) Data Security and User-Agreement Policies

(i) There should be clear guidelines on how to access data.

(ii) There should be scheduled data backups (local and remote)

(iii) Physical data storage devices should be secured and locked.

(d) IT System Maintenance

(i) Software upgrades, hardware upkeep or replacement and server maintenance should be considered, if system is in-house.

(e) Sustainability

(i) In order to ensure sustained support of the eIDSR programme, a sustained financial base will need to be established to account for routine and one-time costs such as hardware system maintenance, training of personnel, connectivity costs and end-user materials, such as those for information, education and communication (IEC).

(ii) There should be local capacity to maintain software and hardware.

(iii) There should be adequate resources to support operational infrastructure.

(iv) There should be enough resources to support capital investments, such as mobile devices and computers, and associated operational costs.

(v) Resources for continued capacity building, training, re-training, etc. should be established.

(vi) eIDSR should be anchored within national eHealth policy and strategy.

(vii) There should be, right from the beginning, stakeholder (including private companies and telecom companies) involvement in the design and implementation stage.

(viii) There should be advocacy for domestic financial resource allocation as well as innovative financial solutions, including leveraging resources from the private sector, such as telecom providers.

(f) Interoperability

(i) Ideally, data may be shared across systems (including with the surveillance system), from the animal and other relevant sectors.

9.5. Using eIDSR in Core Surveillance Functions

There are many components that will ensure successful implementation of eIDSR in the public health sector. These components include understanding the scope and operational environment, using the right tools, and building capabilities within the local context. The One Health approach also provides an opportunity for creating interoperable, interconnected electronic reporting systems between human and animal surveillance systems.

The use of e-tools for conduct of Data Quality Assessment/Assurance (DQA) is also part of a monitoring and evaluation strategy of IDSR functions, which may be used for continuing improvement of data quality. Such tools can identify errors, inconsistencies and other data anomalies which can affect reliable, accurate, precise and complete data.

In Nigeria, establishing an electronic platform has facilitated implementation of the following IDSR activities, as described in previous chapters of the document:

(a) real-time reporting (indicator and event-based surveillance)
(b) alert notification (community and health facility reporting)
(c) case-based reporting
(d) routine reporting (weekly aggregates) and routine monthly reporting
(e) outbreak/emergency management, case investigation refer to chapters 4 and 6 respectively
(f) contact tracing
(g) logistics and supply chain management
(h) real-time outbreak line-listing
(i) event management (hazard description, characterization, risk assessment and outcomes)
(j) information products i.e. Sitreps, epidemiological bulletin etc. refer to chapter 7
(k) supportive supervision
(l) monitoring and Evaluation and Data Quality Assessment (DQA)

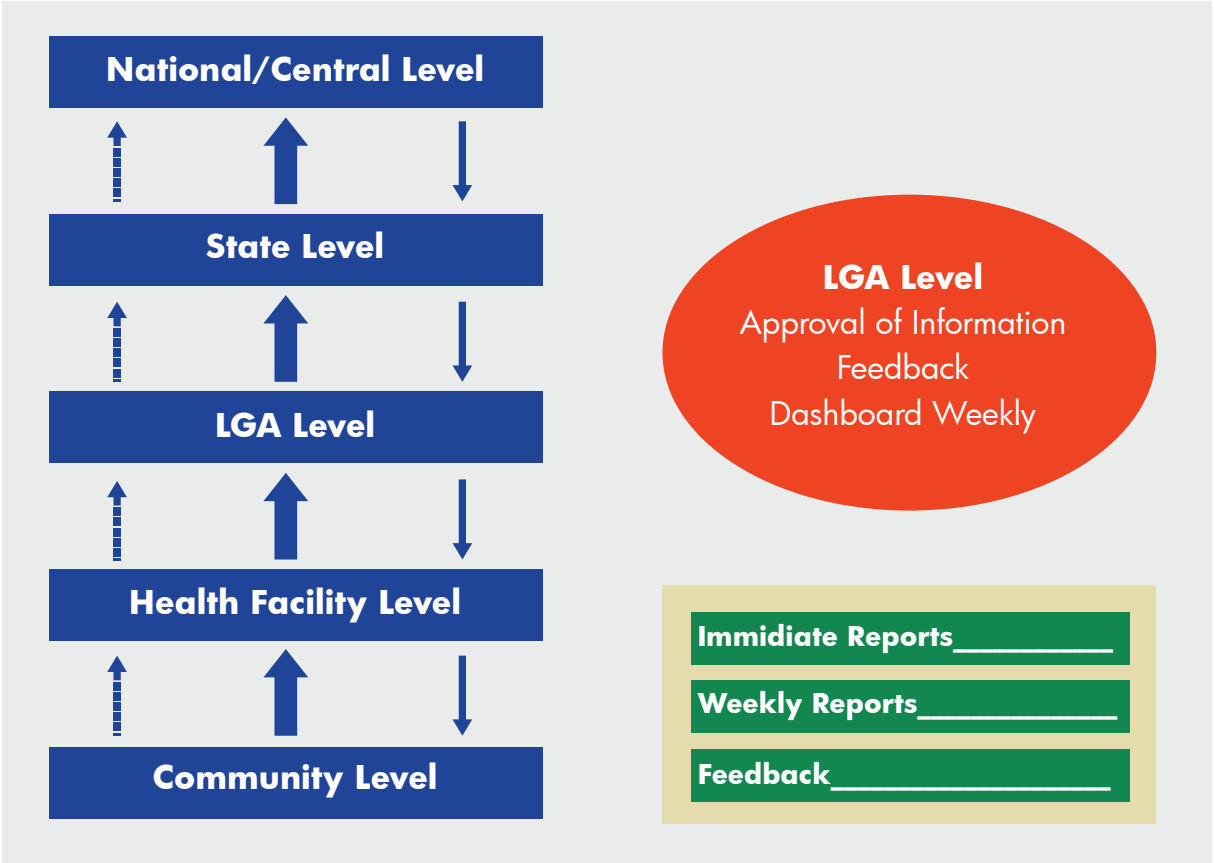

Figure 9.1: Information flow for eIDSR

9.6 Roles and Responsibilities at Different Levels In the Context of Real-time Reporting and Outbreak/Emergency Management

The following are some roles and responsibilities with regard to SORMAS at various levels. These roles should be complemented by specific roles, as described in relevant chapters

(a) Community Level

(i) Contributing information on events e.g. through toll-free helplines

(ii) Acting on alert message sent from health authorities

(b) Health Facility Level

(i) Reporting events requiring immediate action

(ii) Submitting weekly IDSR reports

(iii) Following up on events that are reported by community

(iv) Acting on notifications and response, as recommended, for their area of jurisdiction

(v) Ensuring maintenance and ownership of handset and other tools.

(c) LGA Level

(i) Providing staff access to SORMAS

(ii) Verifying and approving onward transmission of reported events from health facilities

(iii) Issuing alerts to other facilities and leaders, regarding events within the LGA

(iv) Providing feedback to reporting health facilities regarding events

(v) Updating health facilities and leaders on progress made regarding response

(vi) Training, mentorship and supervision of health staff

(vii) Mobilising resources to support effective implementation of SORMAS

(viii) Ensuring availability and compatibility of ICT equipment with SORMAS

(d) State Level

(i) Training and supervision

(ii) Collaborating with national level to develop and update electronic tools

(iii) Issuing alerts to LGAs

(e) National Level

(i) Maintaining the server

(ii) Developing and updating electronic tools

(iii) Managing SORMAS including troubleshooting

(iv) Maintaining system administration (registration of health staff using server)

(v) Training and supervision

(vi) Providing feedback

(vii) Issuing alerts to other facilities

(viii) Coordination of partners and stakeholders

(ix) Ensuring linkage with other platforms to facilitate interoperability

(x) Monitoring alerts

(xi) Advocacy with policy-makers, and resource mobilisation to sustain the system,

(xii) Ensuring data security

(xiii) Overseeing development and implementation of national eHealth/ digital health strategy

(xiv) Aligning SORMAS investments, and working with national eHealth/ digital health strategy

(xv) Considering eHealth/digital health architecture with re-usable components

(xvi) System governance.

(f) Regional Bodies (WHO, AU, WAHO, ECOWAS, etc.)

(i) Facilitating creation of formal platform for sharing information and data across countries

(ii) Technical assistance to Member States

(iii) Sharing best practices and facilitating exchange of expertise

9.7 Supervision, Monitoring and Evaluation

The development and implementation of SORMAS requires constant monitoring. This is very important during the initial system development and implementation phase. System functionality can be evaluated by looking at issues such as:

(a) Acceptability or willingness to participate. I.E. Number of people who are accessing and using the system correctly

(b) Accessibility – Is the system accessible from the place where the reporting site is situated? In some areas, where mobile telephone is used for eIDSR, accessibility is an important aspect, and this can hamper prompt reporting of diseases

(c) Data quality and completeness – Check for any data errors

(d) Timeliness of data submission

(e) System flexibility, portability and stability

(f) Cost.

To improve data use at the service level, users should be encouraged to use the system with regular feedback of information to lower levels, information flow should be two-way.

Other system performance indicators include core surveillance indicators for monitoring IDSR (refer to chapter 8). The IDSR supportive supervision checklist should be used during supervisory visits, while considering integrated needs from other teams, in terms of joint supervision.

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10 Tailoring IDSR to Emergency or Fragile Health System Contexts

10.1 Introduction

Humanitarian emergencies have major implications for the populations where they occur and for their health services surveillance systems (WHO, 2012). Emergencies typically result in population displacement to congested settings where access to basic needs like water, food, shelter and other social services are constrained. These conditions increase the risk of death from common epidemic and endemic diseases.

Consequently, effective public health surveillance and outbreak response is a priority during public health emergencies in affected populations. Due to the disruption of health and other social services during the emergencies, the routine IDSR system must be enhanced to meet the public health surveillance and outbreak response needs in humanitarian contexts. In these settings, IDSR should be tailored to the prevailing context to meet the additional emergency needs.

Similarly, an Enhanced IDSR system should be established in such settings to address the humanitarian emergency. It should be based on the IDSR strategy, structures, tools, guidelines and resources, but should ensure the flexibility required in addressing the surveillance and response needs of affected populations in emergency situations. This should be done within the existing national IDSR system.

This chapter introduces key principles of implementing IDSR in complex humanitarian emergencies. This will involve enhancing IDSR core functions to ensure early detection, assessment and response to acute public health events. Refer to the WHO document on early detection, assessment and response to acute public health events - implementation of early warning and response with focus on event- based surveillance, (WHO, 2014).

10.2 Health Information System in Emergency Contexts

Acute and protracted crises have major immediate and long-term effects on population health and health systems. Conflicts and disasters create disruptions in the overall functionality of the health system. In such situations, the routine IDSR system may be underperforming or may be disrupted. The IDSR must therefore be tailored to adequately meet the surveillance information needs of a humanitarian emergency. Examples of such humanitarian emergencies include: armed conflicts, famine, natural disasters and other major emergencies.

10.2.1 Key Definitions in Emergency Contexts

Disaster

A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources (International Strategy for Disaster Reduction [ISDR], 2009). A disaster is also defined as a situation or event which overwhelms local capacity, necessitating additional national or international assistance (Center for Research on Environmental Decisions [CRED, Relief Web, 2008).

Humanitarian Emergency

A situation where the basic human needs of a population are threatened and therefore requires extraordinary measures and urgent action (Relief Web, 2008).

Complex Emergency

A humanitarian crisis in a country, region or society where there is total or considerable breakdown of authority resulting from internal or external conflict and which requires an international response that goes beyond the mandate or capacity of any single and/or ongoing UN country programme (Relief Web, 2008).

10.3 Early Warning and Response

Early warning is an organized mechanism to detect, as early as possible, any abnormal occurrence or any divergence from the usual or normally observed frequency of diseases, conditions and events. It relies on a network of people from functional static or mobile health facilities/clinics whose responsibility it is to collect, investigate, report, analyze and disseminate information from the field to the central level for appropriate action.

10.3.1 Why is it Needed?

The enhanced surveillance needs during humanitarian emergencies demands that surveillance systems are in place for systematic collection, collation, analysis, and interpretation of data, and for dissemination of information to facilitate public health response to prevent excess morbidity, mortality and disability (WHO, 2009). Consequently, during the acute phase of a humanitarian emergency, IDSR should be modified as soon as possible to focus on priority health problems during the emergency phase. The tailored IDSR should focus on diseases, conditions or events for a given emergency context and should be flexible enough to respond to other emerging public health priorities (WHO, 2009).

During emergencies, populations are more vulnerable to morbidity, mortality and disability resulting from endemic and epidemic-prone diseases. Thus, IDSR should be enhanced within

3–10 days of grading the public health emergency to facilitate rapid detection and response to disease outbreaks and public health events (WHO, 2009). Ultimately, this will contribute to the overall goal of reducing avoidable mortality, morbidity, and disability during humanitarian crises (WHO, 2009b).

10.3.2 The Objectives of Tailoring IDSR to Emergency Context

The main objective is to rapidly detect and control acute public health events of any origin, with particular attention to prioritised health risks. The aim is to increase sensitivity of detection, quality of risk assessment,

and timeliness and effectiveness of the response to acute public health risks in order to minimize the negative health consequences to the affected population.

The specific objectives are to:

(a) Detect acute public health events and health risks early.

(b) Ensure immediate communication of information from local and intermediate levels to national levels as well as from any source identified at the national level.

(c) Verify the initial information (i.e. the signal).

(d) Document the nature of the event through investigation, characterisation and etiological confirmation.

(e) Perform risk assessment to determine the level of risk posed by the detected event.

(f) Ensure immediate alert mechanisms from national and/or state to local government levels.

(g) Ensure prompt investigation as necessary and implement an adequate response through mitigation and control measures, as required by the continuous risk assessment.

(h) Alert and maintain communication/coordination with national international stakeholders.

10.3.3 Critical Components

During humanitarian crises, all functional static and mobile health facilities/clinics, including those in camps for refugee and internally displaced persons (IDPs) which provide curative, preventive and health promotion interventions should be included in the IDSR network to enhance the sensitivity of the system (WHO, 2009). Depending on the extent of the crisis, the surveillance network may include government and/or partner-supported clinics (WHO, 2012).

To ensure efficiency, the data collection and analysis processes need to be structured and standardised. Epidemic intelligence should be based on the two main IDSR event detection systems, namely: indicator-based surveillance (immediate and weekly reporting of data aggregated by health facilities) and event-based surveillance, which is the organized collection, monitoring, assessment and interpretation of mainly unstructured ad hoc information regarding health events or risks. These complementary systems increase the sensitivity of IDSR to ensure timely detection and verification of outbreaks, and effective monitoring of morbidity patterns (WHO, 2012)

10.4 Implementation of IDSR in Humanitarian Emergencies

10.4.1 Rapid Assessment of the Situation

During the acute phase of the emergency, it is helpful to undertake a systematic assessment of the risk of acute public health events. This involves gauging both the likelihood of a disease occurring and its eventual impact. The assessment can identify the epidemic-prone diseases that have the potential to cause the greatest amount of morbidity and mortality in the affected population, and determine the geographical scope of surveillance. An assessment of the status of key surveillance infrastructure is also done, including existing surveillance capacity, identification of resource needs for IDSR implementation, including staff with relevant skills, communication and information technology (IT) equipment, laboratory support and transport. The assessment should be based on consensus-building, analysis of existing data, establishment of technical working groups and conducting of in-depth interviews, as required. It should be based on an all-hazards approach and be repeated as the emergency evolves, to account for changes.

10.4.2 Gap Analysis

The gap analysis should be performed to complement the situation analysis and the assessment of the surveillance system. It aims to assess the specific needs and environment and review the strengths, weaknesses, opportunities and threats around the existing national surveillance system in order to identify available resources to reinforce IDSR. Gap analysis does not require a new or additional formal evaluation to be carried out. The results of previous evaluations of the surveillance system can be reused. In cases where not all of the information needed is available, focus groups or in-depth interviews with stakeholders at all levels of the surveillance system could be considered.

10.4.3 Prioritisation

In order to ensure the most efficient use of resources, the strategy should be based on a prioritisation exercise, the results of the gap analysis and the list of priority events for surveillance. For each selected disease, condition or event, surveillance objectives need to be specified based on the country's context. The objectives will depend on the characteristics of the disease, condition or event (e.g. attack rate, morbidity and mortality, setting), the mode of transmission (e.g. person to person, point source outbreaks, exposure to toxic substances), and the nature of the public health interventions required to control spread.

10.4.4 Development of a Plan of Action for the Implementation of IDSR

Once the prioritisation exercise has been completed and all potential sources of information listed, a plan of action should be developed and implemented at the national, intermediate and local levels. The plan of action should be well-integrated with the national IDSR system, including monitoring and evaluation.

10.4.5 Designate a Coordination Mechanism

A coordination structure should be established at the national and intermediate levels to ensure a single-entry point for reporting, analysis and triaging of information, verifying signals, assessing risks, and monitoring and responding to acute public health events.

10.5 Various actors in enhancing IDSR to improve early warning and response

During acute or complex emergencies where the capacity of the national and sub-national IDSR system is greatly constrained, the roles and responsibilities of various actors may need to be reinforced.

10.5.1 National Level

The overall coordination of data collection, entry, analysis and dissemination during humanitarian crises should be undertaken by the NCDC with support from WHO and other partners, and fed as necessary to the PHEOC. The National PHEMC coordinated by the national PHEOC is activated, to support the coordination and response activities in the affected States and LGAs. However, during acute crises or complex emergencies where the capacity of the national surveillance coordination unit is greatly constrained, a coordinator (typically an epidemiologist or public health expert with experience in disease surveillance and disease control) in emergencies can be recruited to support the NCDC during the acute phase of the crisis (WHO, 2012). The functions of the coordinator will be guided by the initial rapid assessment and should include but not be limited to:

(a) Providing dedicated technical oversight.

(b) Coordinating the supervision of surveillance and outbreak response activities in crisis - affected areas.

(c) Guiding coordination of health workers and partners for effective disease surveillance and outbreak/public health response in crisis-affected populations.

(d) Supporting LGAs or state to investigate and respond to outbreaks or public health events including reorientation of staff in IDSR.

(e) Conducting regular analysis of epidemiological trends and production of regular surveillance bulletins and situation reports.

(f) Providing aids for reporting and notifying priority diseases, conditions and events.

(g) Supporting evaluation of the response activities

10.5.2 LGA or State Levels

The existing IDSR focal points at LGA or state level should coordinate surveillance and response activities in crisis-affected populations. However, during acute crises or complex emergencies where the capacities of LGA, state or national surveillance focal points are constrained, WHO country office, working in close collaboration with the health cluster, should assign a partner or a focal point in each affected LGA to:

(a) Support the coordination of disease surveillance and outbreak response in crisis-affected populations.

(b) Ensure timely reporting of priority diseases, conditions and events related to the crisis.

(c) Conduct trend analyses and provide feedback to health facilities and clinics.

(d) Conduct initial investigation of disease outbreaks and public health events.

(e) Respond to disease outbreaks and public health emergencies in collaboration with the NCDC, partners, and local health facilities.

10.5.3 Public and Partner-Supported Health Facilities or Clinics

All identified focal persons working in health facilities or mobile clinics offering curative, preventive and health promotion services should implement the following:

(a) Detect, collect and report priority diseases, conditions and events.

(b) Support the verification and investigation of outbreaks and public health events.

(c) Undertake public health and outbreak response measures, with support from the community focal persons, LGA, state and national surveillance focal points.

10.5.4 List of Diseases/Conditions/Events

During the acute phase of a humanitarian crisis, a rapid risk assessment should be undertaken to identify diseases, conditions, and events that pose a threat to the population. These should be prioritized in addition to the national IDSR priority list. In identifying the list of additional priority diseases, conditions and events, criteria for inclusion should take into account WHO guidelines for inclusion of an event under a surveillance system (WHO, 2012), namely:

(a) Epidemic prone diseases

(b) Vaccine preventable diseases due to disruption of immunization in most of the emergencies.

(c) Ability to cause severe morbidity or death.

(d) International surveillance requirements in line with IHR (2005).

(e) Availability of prevention and control measures.

(f) Availability of reliable and meaningful case definitions and simple laboratory tests, where appropriate.

It is critical that clinicians register the most important diagnosis per patient and that only new case visits are counted and not the follow-up visits.

The sources of data on new cases include:

(a) Outpatient clinics

(b) Inpatient clinics

(c) Laboratory

(d) Mobile clinics in the community or from focal people identified from community

(e) IDP/refugee camp clinics

(f) Other sources of event-based information

10.5.5 Case Definitions

For the diseases, conditions and events already included on the IDSR priority disease list, the existing case definitions should be used. Sensitive case definitions that increase the chances of detecting new outbreaks should be developed for the additional diseases, conditions, events and syndromes identified as part of the risk assessment. These case definitions should be simple, standardized and harmonized with the national IDSR case definitions.

10.5.6 Laboratory Support

Quality assured WHO approved Point of care Rapid Diagnostic Test (RDT) kits for diseases like malaria, and cholera are essential for timely treatment and outbreak response decisions.

Laboratory confirmation is more critical for suspected outbreaks in crisis-affected populations and the following should be in place to facilitate timely investigation of new outbreaks:

(a) Adequate stocks of outbreak and sample collection kits/SOPs (standard operating procedures) at the local level

(b) Cold chain and shipping arrangements that are linked to the national specimen transportation network.

(c) Field or mobile laboratories that are set up to address the routine and outbreak laboratory testing needs of crisis-affected populations.

(d) Existing laboratories at national and sub-national levels that have been strengthened to address the extra demands of crisis-affected populations.

(e) Referral laboratories (national and international) should be identified to facilitate laboratory confirmation, antibiotic susceptibility testing and quality control.

(f) The existing IDSR laboratory and case investigation forms should be used for routine collection and reporting of laboratory aggregate and case-based data.

(g) Harmonisation of laboratory reporting between surveillance and laboratory systems for timely dissemination of results.

10.5.7 Methods of Data Collection

Data should be collected on reportable alerts and priority diseases, conditions and events that are generated from data sources, such as inpatient and outpatient clinics, mobile clinics, laboratories, disease-specific active case search or outbreak investigations, community health workers, community alerts and other sources of disease surveillance data. Health workers should observe the following standards:

(a) Strict adherence to the case definitions while collecting disease, conditions or event data.

(b) Each patient should be assigned one main diagnosis and counted once.

(c) New and follow-up visits should be coded separately in the health facility register.

The data collection will entail the following paper-based tools and/or electronic platforms:

(a) National Health Management Information System (HMIS) outpatient and inpatient registers.

(b) IDSR immediate case-based and laboratory investigation form

(c) IDSR weekly/monthly summary reporting form.

(d) IDSR health facility alert logbook.

(e) Disease specific line lists.

(f) Generic or disease-specific case investigation forms.

(g) Mortality line lists.

10.5.8 Data Reporting and Transmission Methods

Humanitarian crises tend to disrupt existing national disease surveillance platforms for transmitting data. In the same way, crisis-affected populations may have additional public health needs beyond the ones established through the routine IDSR. Flexibility should be exercised to update the existing IDSR/HMIS reporting tools to capture diseases, conditions and events unique to crisis-affected populations. Consequently, the existing IDSR/HMIS paper-based tools and/or electronic reporting platforms should be updated to capture such additional diseases, condition, and public health events.

The reporting platforms (paper based and/or electronic) should provide for the following reporting timelines:

(a) Immediate reporting of epidemic-prone disease alerts.

(b) Daily reporting of aggregated and/or case-based data on priority diseases, conditions, events during the acute phase of the crisis and after a new outbreak is confirmed.

(c) Weekly reporting of aggregated data on priority diseases.

(e) Weekly mortality line listing should be updated with community and health facility deaths and reported.

10.5.9 Data Analysis and Interpretation

The principles of data analysis utilized as part of the routine IDSR should be used in crisis - affected populations. Analysis on aggregated data is therefore conducted to document and describe disease trends and crossing of thresholds. The data is also used to calculate ratios and rates.

Before embarking on any analysis, data validation and cleaning should be undertaken for missing entries, outliers, and duplicates. The basic analysis entails case/death descriptive analysis by time, person, and place.

Morbidity indicators in crisis-affected populations include:

(a) Absolute counts of cases and deaths by priority disease.

(b) Incidence of disease (new cases by week divided by the total population) with a graph to show trends from recent weeks. This can be disaggregated by location and person characteristics.

(c) Proportional morbidity (new cases of disease in a week divided by the new consultations in the week).

(d) Case fatality ratio (CFR) – the proportion of cases that die from a specific disease.

(e) Attack rate during outbreaks as the cumulative incidence of epidemic disease in a population over a period of time.

The mortality indicators in crisis-affected populations

It is critical that mortality rates {Crude Mortality Rate (CMR) and Under-five Mortality Rate (U5MR)} are monitored for crisis-affected populations to ensure that rates exceeding the established emergency threshold are detected and responded to promptly.

(a) CMR as deaths per 10 000 per day is calculated as the number of deaths divided by the population present during the period and the total number of days over which the deaths were reported.

(b) U5MR as deaths per 10 000 per day is calculated as the number of deaths in under-fives divided by the population of under-fives present during the period and the total number of days over which the deaths were reported.

The existing electronic platforms offer the advantage of automated analyses for both routine and case-based outbreak data thus saving time and ensuring analysed data is available in real- time to inform disease surveillance and outbreak response decisions at all levels.

10.5.10 Feedback and Dissemination

Feedback is critical for ensuring full engagement of the stakeholders. In addition to informing disease control efforts, information providers must be included in feedback. Weekly surveillance summaries, bulletins and presentations should be presented and reviewed during:

(a) Weekly IDSR or outbreak committee meetings.

(b) Health and Water, Sanitation and Hygiene (WASH) and other relevant meetings.

(c) Other relevant disease control meetings.

(d) Extension of all reporting units and stakeholders to inform public health response decisions

(e) Outbreaks, regular situation reports should be shared with all stakeholders.

The existing electronic platforms offer the advantage of producing automated disease surveillance and epidemic bulletins or situation reports to inform disease surveillance and outbreak response decisions at all levels.

10.5.11 Support Functions for Surveillance in Crisis-Affected Populations

To optimise the functioning of disease surveillance and outbreak response in crisis -affected populations, it is critical that IDSR guidelines are adapted and used to improve access to the following:

(a) Surveillance and outbreak response guidelines at all levels.

(b) Training of health workers, surveillance focal persons or points and rapid response teams on surveillance functions including outbreak preparedness, investigation and response.

(c) Support to communication (computers, phones, internet connectivity etc.) based on local context and surveillance needs.

(d) Regular supervision and support to enhance surveillance functions at all levels.

(e) Periodic evaluation to improve the performance of the surveillance system (refer to framework for evaluating surveillance systems).

10.5.12 Outbreak Preparedness

Outbreak preparedness is paramount given the heightened risk of disease outbreaks in crisis- affected populations. Preparedness efforts should, as much as possible, be integrated in the existing national IDSR framework at national and subnational levels with the NCDC leading the efforts and supported by WHO and partners. However, during acute or complex emergencies where the capacities of the NCDC are greatly compromised or diminished, WHO, working with the health cluster partners should take lead to enhance outbreak preparedness (WHO, 2012). The key preparedness efforts in crisis-affected populations should entail the following:

(a) Strengthening existing or forming new multisectoral outbreak control teams at national and sub national levels, with roles and responsibilities designated for each team member.

(b) Updating existing or developing new outbreak prevention and response plans that incorporate risks unique to crisis-affected populations.

(c) Development or updating (if necessary) of standard line-list forms for data collection during an outbreak.

(d) Development and distribution of standard treatment protocols for key diseases, with strategies for training of staff.

(e) Calculation of potential attack rates for epidemic-prone diseases, where possible.

(f) Pre-positioning stocks of essential treatment supplies to initiate outbreak control (e.g. oral rehydration salts, intravenous fluids, vaccination material, personal protective equipment, transport media for samples, water purification supplies, disinfectants, spray pumps and information leaflets on preventive measures for health staff or the community)

(g) Procurement of laboratory sample collection for the priority diseases, and identification of a competent laboratory for confirmation of cases.

(h) Identifying potential sites for isolation and adequate treatment of patients, or for extra capacity, in the event of a surge in cases (e.g. a cholera treatment centre)

(i) Implementing relevant prevention measures based on the risk assessment of diseases (e.g. measles and cholera vaccination, indoor-residual spraying of dwellings and distribution of long-lasting insecticide-treated nets to prevent malaria).

(j) Scaling up preparedness and response efforts/ activating rapid response teams at the points of entry (PoE).

10.5.12.1 Alert and Epidemic Thresholds

The following thresholds are used in crisis-affected populations:

(a) Assess the severity of the humanitarian crisis based on the CMR and U5MR.

  (i) The CMR threshold should be less than 1 per 10 000 people per day.

  (ii) The U5MR threshold should be less than 2 per 10 000 people per day.

(b) Alert system for detecting possible outbreaks based on doubling of weekly incidence compared to the weekly average of previous 2-3 weeks.

(c) Detection of a case of potentially severe epidemic-prone disease like measles, polio, cholera, viral haemorrhagic fevers (VHF) or meningitis based on the IDSR alert and action thresholds specific to crisis-affected populations.

Once the thresholds are exceeded, verifications, investigations and response should be instituted promptly to prevent further morbidity and mortality.

10.5.12.2 Alert Verification

To minimise morbidity and mortality, alert verification should start immediately once the alert is received by sub-national and national surveillance focal points (WHO, 2012). The verification can be done by telephone or site visit and can include the collection of information about:

(a) Cases based on standard case definitions.

(b) Symptoms and signs (consider differential diagnoses).

(c) Date of onset of symptoms of the first and the most recently detected cases.

(d) Place and date seen or admitted at the health facility.

(e) Age, sex and vaccination status of patients, where relevant.

(f) Place of residence at onset of illness.

(g) Where cases are occurring (community-level data)

(h) Geographical, personal and time relationships between cases.

(i) Prompt laboratory investigation of samples from suspected cases.

(j) Outcomes including, for example, deaths, case management details and the health-care staff affected.

10.5.13 Outbreak Investigation

Outbreak investigation involves determining the cause of an outbreak and who is at risk so that control measures can be implemented. The main objective of an outbreak investigation is to control the outbreak and thus reduce morbidity and mortality. The investigation should begin as soon as an alert is detected and has been verified.

The investigations should be undertaken by rapid response teams at national and sub- national levels that have been established as part of the national IDSR framework. In acute and complex emergencies, dedicated and trained teams will be identified to undertake the investigations, which should follow existing IDSR outbreak investigation guidelines that have been adapted to address the unique needs of crisis-affected populations.

10.5.14 Outbreak Response

Outbreak response should follow the existing national IDSR framework at national and sub national levels with the country's existing structures leading the efforts. However, during acute or complex emergencies where the capacities of the country are greatly compromised or diminished, WHO, working with the health cluster partners should support in coordinating and implementing outbreak response activities.

The additional risks in crisis-affected populations will demand strengthening existing or formation of new multisectoral outbreak control teams at national and subnational levels, with roles and responsibilities designated for each team member as set out in the IDSR outbreak response guidelines. Health, Water, Sanitation and Hygiene (WASH) and other relevant cluster partners should support outbreak response activities in crisis -affected populations.

During the recovery phase of the crisis, NCDC should work with WHO and partners to re-establish all the IDSR structures and focal points in the crisis -affected populations. The government should aim at conducting an evaluation to assess what happened, why it happened and document lessons learnt and gaps identified to inform the recommendations to prevent future occurrence.

10.6 References

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11 Summary of guidelines for Specific Priority Diseases

This section provides summary guidelines for each of the priority diseases, events and conditions targeted for surveillance by WHO/AFRO. It provides disease/event/condition specific guidance to:

- Take action to respond to alerts and action thresholds,
- Identify surveillance goals and objectives,
- Surveillance data analysis and interpretation,
- Prepare to use the district analysis workbook or database,
- Standard case definitions for reporting diseases/event s/conditions.

This chapter is intended as a rapid reference. When additional information is required, please use the detailed references listed in the summary. The table below shows how information is organised in this section.

11.0 Priority Disease/Event/Condition for IDSR

Background
In this sub-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/event is a priority for surveillance. For example, the disease/event is responsible for a high number of deaths, disability and illness, • General and specific risk factors in African countries. • Any additional background information that might serve the district surveillance team.
Surveillance Goal
This sub-section states how the surveillance information is used for action.
Standard case definition
Suspected case: A definition is provided for suspecting a case or outbreak of this disease or event. **Probable case:** A definition is provided for a suspected case with epidemiological link to a confirmed case or an outbreak if laboratory confirmation results are not available. **Confirmed case:** A definition is provided for classifying a case as confirmed through laboratory diagnostic testing.

Respond to alert threshold

Some diseases or events have program specific thresholds for alerting the health facility or district to a potential problem.

For epidemic-prone diseases, diseases targeted for elimination or eradication, or public health events of international concern, a single case is a suspected outbreak and requires immediate reporting followed by patient treatment, collection of specimens for case confirmation, and investigation of the case to determine the risk factors and potential interventions.

For other priority diseases of public health importance, an outbreak or event is suspected when there is any unusual cluster, pattern, or increase in the number of cases when compared with previous time periods. This should prompt a response such as investigating what might have caused the unusual events. If laboratory confirmation is indicated, specimens should be collected for laboratory confirmation.

Respond to action threshold

For epidemic-prone diseases, diseases targeted for elimination or eradication, or public health events of international concern, a confirmed case should trigger a response such as conducting an emergency immunization activity, enhancing access to safe drinking water, community education campaigns, and improving case management.

For other priority diseases of public health importance, a confirmed outbreak should prompt an appropriate response such as improving coverage for specified immunizations, strengthening case management, providing information, education and communication about preventing and controlling the disease, and so on.

Analyse and interpret data

This sub-section contains generic information about the minimum data elements to collect, Analyse and interpret. The key points to consider for interpreting the data and specific elements for analysis are also stated (time, place, and person).

Laboratory confirmation

In this sub-section, guidelines on laboratory confirmation are provided including: relevant diagnostic tests, how to collect, store and transport the specimens needed for 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.

11.1 Acute Haemorrhagic Fever Syndrome

Background

Acute haemorrhagic fever syndromes can be attributable to Ebola and Marburg viral diseases (filoviridae); Lassa fever (arenaviridae), Rift Valley fever (RVF) and Crimean-Congo haemorrhagic fever (CCHF) (bunyaviridae); dengue (dengue haemorrhagic fever (DHF)) and yellow fever (flaviviridae); and other viral, bacterial or rickettsial diseases with potential to produce epidemics.

All cases of acute haemorrhagic fever syndrome whether single or in clusters, should be immediately notified without waiting for the causal agent to be identified.

Surveillance goal

Early detection of acute haemorrhagic fever syndrome cases and outbreaks, rapid investigation, and early laboratory verification of the cause of all suspected cases and 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 Lassa fever).

Standard case definition(Lassa fever)

Suspected case: Any individual presenting with one or more of the following: malaise, fever, headache, sore throat, cough, nausea, vomiting, diarrhoea, myalgia, chest pain, hearing loss and either a. History of contact with excreta or urine of rodents b. History of contact with a probable or confirmed Lassa fever case within a period of 21 days of onset of symptoms OR Any person with inexplicable bleeding/hemorrhage.

Probable case: A suspected case (see definition above) who died or absconded without collection of specimen for laboratory testing

Confirmed case: A suspected case with laboratory confirmation (positive IgM antibody, PCR or virus isolation)

Note: During an outbreak, case definitions may be changed to correspond to the local event. It is important to note that during outbreaks, most cases might not show haemorrhagic manifestation, a proper history taking is crucial

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the appropriate levels.
- Suspected cases should be isolated from other patients/people and strict infection prevention procedures should be implemented. Standard precautions should be enhanced throughout the health care setting and in communities.
- Treat and manage the patient with supportive care.
- Collect the appropriate specimen (blood) while observing strict infection prevention and control procedures to confirm the case.
- Complete a laboratory request form, use triple packaging of the specimens (see detailed SOP for triple packaging) and mark well the containers to warn of a potential laboratory biosafety risk.
- Complete the case investigation form for all cases
- Conduct case-contact tracing and follow-up (See detailed SOP for contact tracing and follow up).
- Conduct active case search for additional cases
- Begin or enhance case reporting and surveillance; as well as screening procedures for fever and VHF related symptoms

Respond to action threshold

If a single case is confirmed:

- Maintain strict VHF infection prevention and control (IPC) practices* throughout the outbreak.
- Mobilize the community for early detection and care and conduct community education about how the disease is transmitted and how to implement IPC in the home care setting and during funerals and burials. Consider social distancing strategies.
- Conduct case-contact follow-up and active search for additional cases that may not come to the health care setting.
- Request additional help from other levels as needed.
- Establish an isolation ward or treatment centre to handle additional cases that may come to the health centre and ensure strict IPC measures to avoid transmission in health care settings.
- Suspected cases should be isolated and treated for more common conditions with similar symptoms, which might include malaria, typhoid, louse borne typhus, relapsing fever or leptospirosis. Ensure a barrier is instituted between suspected and confirmed cases.
- Provide psychosocial support for the family, community and healthcare workers.
- Consider quarantine for high risk contacts with home support during the incubation period and ensure daily follow up of their movements.
- There are promising vaccine candidates under development for some VHDs that might be useful in the event of outbreak in a ring vaccination approach and for health care workers.
- Treat conservatively the symptoms which might be presented; severe cases require intensive support and care, if dehydrated ensure fluid replacement with fluids that contain electrolytes.
- A range of potential treatment options including blood products, immune therapies, and drug therapies are currently being evaluated

Analyse and interpret data

Person:	Implement immediate case-based reporting of cases and deaths. Analyse age and sex distribution. Assess risk factors and plan outbreak response interventions accordingly.
Time:	Graph cases and deaths daily/weekly. Construct an epidemic curve during the outbreak.
Place:	Map locations of cases' households and work sites. If you have a GPS gadget, this will add to understand exact location of the cases; as well as contacts.

Laboratory confirmation

Diagnostic test	Laboratory confirmed cases must test positive for the virus antigen, either by detection of virus RNA by reverse transcriptase-polymerase chain reaction (RT- PCR), or by detection of IgM antibodies directed against Ebola/Marburg, CCHF, Lassa or West Nile Fever
Specimen	For ELISA: Whole blood, serum or plasma For RT-PCR: Whole blood or blood clot, serum/plasma or tissue For immunohisto-chemistry: Skin or tissue specimens from fatal cases **NB: RDTs theoretically can be performed in any health care setting and without additional equipment, however, use of an RDT may result in both false positive and false negative test results. A nucleic-acid based (e.g., PCR) diagnostic assay, such as GeneXpert, must be used to confirm the RDT result. Recent guidance from WHO recommends that antigen detection RDT's for VHDs have no role in the routine management of VHDs in settings where PCR testing is available. However, they may have utility in settings without laboratory infrastructure and where specimens cannot be rapidly transported to a diagnostic laboratory, if their benefits and limitations are understood.**

When to collect the specimen	Collect specimen from all suspected patients. All cases must be investigated, with contact tracing. Blood samples and appropriate clinical specimens must be collected to confirm a diagnosis as rapidly as possible.
How to prepare, store, and transport the specimen	HANDLE AND TRANSPORT SPECIMENS FROM SUSPECTED VHF PATIENTS WITH EXTREME CAUTION. WEAR PROTECTIVE CLOTHING AND USE FULL PPE. *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 NCDC or WHO.

References

- 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

11.2 Acute and Chronic Viral Hepatitis

Background

Viral hepatitis A and viral hepatitis E

- Enterically transmitted HAV and 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 per mucosal 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 sterlised.
- Prevention and control measures for hepatitis B and C include transfusion safety, safe and appropriate use of injections and vaccination (hepatitis B).
- To address the increasing burden of viral hepatitis, in 2016, African member states adopted Prevention, Care and Treatment of viral hepatitis in the African Region: Framework for action 2016-2020
- There is no specific treatment for acute viral hepatitis A, B, C and D.

Surveillance goal

Acute viral Hepatitis

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

Chronic viral hepatitis

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

Standard case definition

Acute Viral Hepatitis

Suspected case: Any person with discrete onset of an acute illness with signs/symptoms of; (i) Acute infectious illness (e.g. fever, malaise, fatigue) and (ii) Liver damage (e.g. anorexia, nausea, jaundice, dark coloured urine, right upper quadrant tenderness of body),

AND/OR

(iii) Raised alanine aminotransferase (ALT) levels more than ten times the upper limit of normal

Confirmed case: A suspected case that is laboratory confirmed by virus specific biomarkers

- Acute Hepatitis A: IgM anti-HAV positive or positive RNA HAV
- Acute Hepatitis B: HBsAg, IgM anti-HBc (IgG) positive
- Acute Hepatitis C:
  - HCV RNA positive (Viral Load) and anti-HCV negative

    OR
  - Seroconversion to anti-HCV[1]

    OR
  - Anti-HCV positive AND IgM anti-HBc negative AND anti-HAV IgM negative AND anti-HEV IgM negative

Acute Hepatitis D: IgM anti-HBc positive plus anti-HDV positive (only as co-infection or super-infection of hepatitis B)

Acute Hepatitis E: IgM anti-HEV positive

Chronic Viral Hepatitis Case definition (HBV and HCV):

Chronic Hepatitis B:

- HBsAg is the first serological marker to appear. Persistence of HBsAg for at least 6 months indicates chronic infection
- HBsAg is present with positive anti HBcIgG

Chronic Hepatitis C:•

- Hepatitis C virus RNA present in a person with antibodies against hepatitis C (Anti-HCV positive)
- HCV RNA positive OR HCV core antigen positive

NB: Antibody detection (i.e HCV Ab positive) cannot differentiate between acute, chronic infection and past infection.

11.2.1 Acute Viral Hepatitis

<table>
<tr><th colspan="2">Respond to alert threshold</th></tr>
<tr><td colspan="2">If hepatitis cases are suspected:
▪ Report case-based information to the appropriate levels.
▪ Collect specimens and send to laboratory to identify the aetiology of the illness
▪ As necessary, treat and manage the Acute viral hepatitis patient(s) with supportive care.</td></tr>
<tr><th colspan="2">Respond to action threshold</th></tr>
<tr><td colspan="2">If hepatitis cases are confirmed
▪ Determine mode of transmission
▪ Identify population exposed to risk of infection
▪ Eliminate common source(s) of infection
▪ Implement appropriate prevention and control interventions
▪ Patients with chronic viral hepatitis should be refereed to tertiary or specialist centres or designated treatment centres for treatment, care and follow-up</td></tr>
<tr><th colspan="2">Analyse and interpret data</th></tr>
<tr><td colspan="2">Time: Analysis of suspected and confirmed cases by week and month. Graph cases and deaths weekly and monthly. Construct an epidemic curve during outbreaks.
Place: Plot location of case households.
Person: Analyse by age and gender. Assess risk factors to plan and monitor prevention and control measures. Calculate the Incidence Rate for Acute Viral Hepatitis cases and Prevalence Rate for Chronic Viral Hepatitis B and C cases and Case Fatality Rate</td></tr>
<tr><th colspan="2">Laboratory confirmation</th></tr>
<tr><td>Diagnostic test</td><td>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</td></tr>
<tr><td>Specimen</td><td>Serum, whole blood or stool (for hepatitis A and E viruses)</td></tr>
</table>

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.

Laboratory Tests for Chronic Viral Hepatitis

Chronic Viral Hepatitis B (HBV)

Basic initial laboratory investigations:

The following laboratory tests should be requested after thorough history and physical examination in HBsAg positive individuals;

a. Establish chronicity: HBcIgG positive or Repeat HBsAg after 6 months if HBcIgG test is unavailable
b. Establish e antigen/antibody status: HBe Ag & Ab
c. Establish inflammatory activity: LFTs,
d. Determine the Level of viraemia – viral load: HBV DNA
e. Screen for complications using Alpha fetoprotein, Abdominal
f. ultrasound, Coagulation profile, Full blood count
g. Screen for other co-infections: HCV Ab, HIV, HDV if available
h. Supportive investigation: determine blood urea and creatinine
i. Consider liver biopsy or fibro-scan if indicated

Chronic Viral Hepatitis C (HCV)

Initial Investigations for HCV Patients:

The screening test for HCV is HCV Ab test. Unlike HBV testing, a positive HCV screening test (anti-HCV Ab) does not equate to active infection. Also, the HCV testing often provides several false positive results. The following steps are recommended to establish active infection;

- Confirm HCV Ab testing using ELISA
- Confirm active infection using RNA testing; detectable RNA confirms active infection; if RNA undetectable, no further testing is indicated. It indicates past infection

Further testing for RNA positive cases include LFT, abdominal ultrasound, Genotyping, FBC, alpha fetoprotein, BUE and Cr; Screen

for co-infections - HIV, HBV

Assess degree of inflammation and fibrosis by conducting the following test:

- Aspartate aminotransferase-to-platelet ratio index (APRI) Score
- Fibrosis-4 (FIB4) score
- Fibroscan
- Liver biopsy is the gold standard.

References

- WHO Recommended WHO/CDS/CPE/SMT/2001.13 Strategies for Prevention and Control of Communicable Diseases;
- WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2
- WHO Fact Sheet No 328, Hepatitis A, revised May 2008. 204, Hepatitis B, revised August
- WHO Fact Sheet No 204, Hepatitis B, revised August
- WHO Fact Sheet No 2008 164, Hepatitis C.
- WHO Fact Sheet No 280, Hepatitis E, revised January 2005.
- World Health Organisation http://www.who.int/topics/hepatitis/en/
- United States, Centers for Disease Control and Prevention http://www.cdc.gov/hepatitis/
- Control of Communicable Diseases Manual, 18th Edition
- WHO Guidelines for the prevention, care and treatment of persons with
- chronic hepatitis B infection; March 2015
- WHO Guidelines for the screening, care and treatment of persons with
- chronic hepatitis C infection; April 2016

11.3 Adverse Events Following Immunization (AEFI)

Background

Reports of AEFIs have had negative effects on national immunization programmes. Most reports are mild, self-limiting clinical signs like low grade fever, local induration at the site of injection, etc. Other relatively serious conditions are "coincidental" events not related to vaccines. It is important to identify and manage all AEFIs, especially serious AEFIs, and conduct thorough investigation to determine their cause.

Surveillance goal

To determine the cause of an AEFI or cluster of AEFIs 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

Respond to alert threshold

If a single case is suspected:

- Treat the patient
- Communicate with the parents and community
- Respond to rumours or public enquiries
- Complete case investigation form

Respond to epidemic threshold

If a single case is confirmed:

- Monitor for a cluster
- Send report immediately to initiate investigation of cause
- Take remedial action to avoid another AEFI occurring from the same cause

Analyse and interpret data

Determine the cause of the event. 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.

Reference

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

11.4 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, 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. Its important to take thorough history to determine if there is occupational exposure, as uneccesary administratio n of antibiotics might led to AMR

Respond to action threshold

If a single case is confirmed:

- Standard infection control precautions are sufficient and should be used when managing the patients
- Particular attention should be paid to body fluid spills which should be managed by the usual methods for cleaning and decontamination of 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 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.

Analyse and interpret data

Time: Graphs of number of suspected / probable / confirmed cases by date.

Place: Map of suspected and confirmed human and animal cases by geographical area (district)

Person: Table showing the number of suspected / probable / confirmed cases by date, age and sex

Laboratory confirmation

Diagnostic test	Isolation of *Bacillus anthracis* from a clinical specimen (e.g. blood, lesions, discharges) Demonstration of *B.anthracis i*n 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 specime. 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. 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 Organisation, 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*
- *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)*

11.5 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. Since 2017, full oral combined antibiotics (rifampicin and clarithromycin) are now recommended for treatment of cases with wound care of ulcers. Surgery is still needed for late cases (category III). Cumulative number of cases in the WHO African Region that is the most affected (95% of global cases) is around 90,000 in 2017.
- Mode of transmission is still unknown. M ulcerans could penetrate the skin through insect bite (water bugs); micro trauma or small wounds
- Confirmation of diagnosis is done by PCR, AFB search with ZN staining, culture or histology. Specimens of lesions are taken by swab in ulcer, fine needle aspiration (FNA) or biopsy in case of surgery. New diagnostic tests based of the presence of mycolactone, a toxin released by M ulcerans in lesions, are under development.

Surveillance goal

- Geographical distribution of the disease to locate endemic areas and districts and focus early case finding, proper management with WHO recommended antibiotics and prevention of disabilities

Standard case definition

Suspected case:A person presenting a painless skin nodule, plaque or ulcer, living or having visited a BU endemic area

Confirmed case: A suspected case confirmed by at least one laboratory test (ZN for AFB, PCR, culture or histology). Confirmation of presence of mycolactone in skin lesions

Respond to alert threshold

If a single case is suspected:

- Report the suspected case to the appropriate level of the health system

At health facility level:

- Take a specimen for laboratory confirmation (Swab or FNA)
- Begin wound dressing and combined antibiotic treatment with: Rifampicin 10 mg/kg daily oral intake for 8 weeks (56 days).
- Clarithromycin 7.5 mg/kg twice daily oral intake for 8 weeks (56 days)
- Refer category III patients to reference hospital/centre
- Fill in case report form (BU 01 or BU 02) with origin village GPS data and report to Health District, Regional and National levels
- Search other cases in origin village of confirmed case of BU

Respond to action threshold

If a suspected case is confirmed (Not applicable to BU)

Analyse and interpret data

Time: Graph of cases by year of diagnosis, graph of cumulative number of cases.

Place: Plot cases by location of households and colour shade endemic districts

Person: Count newly detected cases monthly by category of patients (Cat I, II or III). Analyse age and disability distribution and treatment outcomes (cases cured, cured without limitation of movement or amputation, relapse after recommended antibiotic treatment).

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 ▪ Mycolactone detection in lesion (new)

Specimen	Smears Fine needle aspirations (FNAs) 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
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- *Control of Communicable Diseases Manual,* 18th Edition
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11.6 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

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

Analyse and interpret data

Time: Graph cases and deaths weekly. Construct an epidemic curve during outbreaks.

Place: Plot location of case households with precise mapping.

Person: Report immediate case-based information for cases and deaths. Report summary totals monthly.

During outbreak, count cases and deaths weekly. Analyse by age. Assess risk factors to improve prevention of outbreaks.

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.
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 2° to 8° C serum or clot for testing within 24 hour. If kept for longer store at -80°. For Isolation and RT_PCR ▪ Store at -80° 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. ▪ Minstry 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 labortory. 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 Organisation 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
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11.7 Cholera

Background

- Acute illness with profuse watery diarrhoea caused by *Vibrio cholerae* serogroups O1 or O139. The disease is transmitted mainly through the faecal-oral route; that is through eating or drinking contaminated food or water.
- Cholera causes over 100 000 deaths per year. It may produce rapidly progressive epidemics or worldwide pandemics. In endemic areas, sporadic cases (less than 5% of all non-outbreak-related diarrhoea cases) and small outbreaks may occur.
- Incubation period is from a few hours to 5 days, usually in the range of from 2 to 3 days.
- There has been a resurgence of cholera in Africa since the mid-1980s, where over 80% of the world's cases occurred in 1999. The majority of cases occurred from January through April. In 2016, globally, 38 countries reported a total of 132 121 cases. Of cases reported globally, 54% were from Africa, 13% from Asia and 32% from Hispaniola. Imported cases were reported in 9 countries.
- Cholera may cause severe dehydration in only a few hours. In untreated patients with severe dehydration, the case fatality rate (CFR) may exceed 50%. If patients present at the health facility and correct treatment is received, the CFR is usually less than 1%. At least 90% of the cases are mild, and they remain undiagnosed.
- Risk factors: eating or drinking contaminated foods such as uncooked seafood or shellfish from estuarine waters, lack of continuous access to safe water and food supplies, attending large gatherings of people including ceremonies such as weddings or funerals, contact with persons who died of cholera.
- Other enteric diarrhoea may cause watery diarrhoea, especially in children less than 5 years of age. Please see *Diarrhoea with dehydration* summary guidelines.

Surveillance goal

- Detect and respond promptly and appropriately to cases and outbreaks of watery diarrhoea. To confirm an outbreak, collect and transport stool specimens transported in Cary-Blair medium.
- Do immediate case-based reporting of cases and deaths when an outbreak is suspected.

Standard case definition

Suspected cholera case: In areas where a cholera outbreak has not been declared: Any patient aged two years and older presenting with acute watery diarrhoea and severe dehydration or dying from acute watery diarrhoea.

In areas where a cholera outbreak is declared: any person presenting with or dying from acute watery diarrhoea.

Confirmed cholera: case A suspected case with Vibrio cholerae O1 or O139 confirmed by culture or PCR polymerase chain reaction and, in countries where cholera is not present or has been eliminated, the Vibrio cholerae O1 or O139 strain is demonstrated to be toxigenic

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately.
- Manage and treat the case according to national guidelines.
- Enhance strict hand-washing and isolation procedures.
- Conduct case-based investigation to identify similar cases not previously reported.
- Obtain stool specimen from 5 patients within 5 days of onset of acute watery diarrhoea, and before antibiotic treatment is started. See laboratory guidelines for information on how to prepare, store and transport the specimens.

Respond to action threshold

If a suspected case is confirmed:

- Establish treatment centre in locality where cases occur. Treat cases onsite rather than asking patients to go to standing treatment centres elsewhere.
- Initiate a line listing of suspected and confirmed cases and ensure laboratory results are linked with cases
- Strengthen case management including treatment.
- Mobilize community early to enable rapid case detection and treatment. Survey the availability of clean drinking water.
- Work with community leaders to limit the number of funerals or other large gatherings for ceremonies or other reasons, especially during an epidemic. If seen mandatory, establish bylaws
- Reduce sporadic and outbreak-related cases through continuous access to safe water. Promote safe preparation of food (especially seafood, fruits, and vegetables).
- Promote safe disposal of human waste.
- Ensure adequate collaboration with various sectors including water and sanitation to ensure appropiate interventions are addressed
- Cholera vaccine is available; but its utilization must be accompanied with strategies to improve water and sanitation

Analyse 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. Analyse distributionof cases by age and according to sources of drinking water. Assess risk factors to improve control of sporadic cases and outbreaks.

Laboratory confirmation

Diagnostic test: Isolate V. cholerae from stool culture and determine O1 serotype using polyvalent antisera for V. cholerae O1. If desired, confirm identification with Inaba and Ogawa antisera.

If specimen is not serotypable, consider, V. cholerae O139 (see note in Results column).

Specimen: Liquid stool or rectal swab

When to collect the specimen:

For each new area affected by the outbreak, a laboratory confirmation should done. Collect stool sample from the first suspected cholera case. If more than one suspected case, collect until specimens have been collected from 5 to 10 cases. Collect stool from patients fitting the case definition and Onset within last 5 days, and Before antibiotics treatment has started

Do not delay treatment of dehydrated patients. Specimens may be collected after rehydration (ORS or IV therapy) has begun.

If possible, specimens should be collected from 5 – 10 suspected cases every 1 – 2 weeks to monitor cessation of the outbreak, changes in serotypes, and antibiotic sensitivity patterns of V.cholerae

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 4°C to 8°C
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 (dPHEPRessed 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.

References

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- Management of the patient with cholera, World Health Organisation, 1992. WHO/CDD/SER/91.15 Rev1 (1992)
- Epidemic diarrhoeal disease preparedness and response--Training and practice. Facilitator and participant manuals. World Health Organisation, 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

11.8 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 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 and initiate a line list/register of suspected cases
- Conduct active search for additional cases
- Collect specimens for confirming the cases and ensure results are linked with cases
- Survey the community to determine the abundance of vector mosquitoes, identify the most productive larval habitats, promote and implement plans for their elimination, management or treatment with appropriate larvicides.
- Educate the public and promote 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 bednets.

Refer suspected DHF/DSS cases to more advanced facilities.

Analyse and interpret data	
Time: Graph cases and deaths weekly/monthly. Construct an epidemic curve during the outbreak. **Place:** Plot location of case households and work sites using precise mapping. **Person:** Case-fatality rate. Analyse age and sex distribution. Percentage of DHF / DSS cases and of hospitalisations.	
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.
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	

11.9 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 rPHEPResents 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 STEPwise 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 Organisation 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: ▪ Increasing thirst ▪ Increased hunger ▪ Frequen urination **Confirmed new case:** Any person with a fasting 6.1 mmol/L (110 mg/dl) Or venous plasma glucose measurement of ≥ 7 mmol/L (126 mg/dl) or capillary glucose ≥ Any person with a non-fasting glucose ≥ 11,1 nnik>k (200 venous plasma glucose measurement of ≥ 11.1mmol/L (200 mg/dl) or capillary mg/dl) *Report only the first lab-confirmed

Recommended public health action	
For people with diabetes: ▪ Treat confirmed cases according to the standardized case management guidelines (WHOPEN). **District-level Prevention:** ▪ Implement an integrated prevention and control programme for non-communicable diseases focusing on diabetes through community awareness and education activities conducted in accordance with national prevention and control programmes for non-communicable diseases. These activities would include 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).	
Analyse and interpret data	
Time: Graph cases quarterly to Analyse trends. **Place:** Compare district trends with national and regional trends. **Person:** Analyse the distribution of cases by age and other demographic factors. **Data for non-communicable diseases is Analysed for long term trends*	
Laboratory confirmation	
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 tu 16 hours. For children the fasting time is 6 hours. Post-prandial specimen: 2h 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.

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/
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- 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

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11.10 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 (abdominal pain) and diarrhoea with visible blood in stool.

Confirmed case:

Suspected case with stool culture positive for *Shigella dysenteriae* type1.

Respond to alert threshold

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. Initiate a line list/register of cases
- Strengthen case management and treatment.
- Collect apporpiate samples and link results with cases
- Mobilize community to enable rapid case detection and treatment.
- Identify high risk populations using person, place, and time data.
- Reduce sporadic and outbreak-related cases by promoting hand-washing with soap or ash and water after defecating and before handling food.
- Ensure access to safe water supply and storage, and use of latrines and safe disposal of human waste.
- Ensure adequate collaboration with various sectors including water and sanitation to ensure appropiate interventions are addressed

Analyse 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 Analyse 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 tightly-fitting cap. Specimens not preserved in Cary-Blair will have significant reduction of *shigellae* after 24 hours. If storage is required, hold specimens at 4°C to 8°C, and do not freeze.
Results	Culture results are usually available 2 to 4 days after receipt by the laboratory. SD1 isolates should be characterized by antibiotic susceptibility. After confirmation of initial 5-10 cases in an outbreak, sample only a small number of cases until the outbreak ends, to monitor cessation of the outbreak, and antibiotic sensitivity patterns, which will guide the definitive treatment. 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

11.11 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 rPHEPResent the second leading cause of death among children less than 5 years of age in many African countries, with more than 3 million deaths per year.
- Different epidemiological patterns (for example, seasonality) are observed for different pathogens.
- The WHO and UNICEF advocate that each district team use the Integrated Management of Childhood Illnesses (IMCI) strategy to reduce morbidity and mortality of childhood diarrhoea.

Surveillance goal

- Detect diarrhoea outbreaks promptly. Laboratory confirmation can confirm specific pathogenic agent outbreak, but laboratory confirmation is not necessary for routine surveillance of diarrhoea with dehydration.
- Monitor antimicrobial resistance during outbreaks of bacterial origin.

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.

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.

Analyse 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 severedehydration 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 Organisation. WHO/CDR/95.14*
- *Integrated Management of Childhood Illness: A WHO/UNICEF Initiative Bulletin of the World Health Organisation. Vol. 75, 1997, Supplement 1, 1997. ISBN 92 4 068750 5*

11.12 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, inflicting to affect individuals an excruciating pain and usually temporary disability, leaving many patients with unfortunate socio-economic consequences. It is transmitted through ingestion of water containing a crustacean (cyclops) which is infested by an immature form (larvae) of the nematode. The Cyclops is found in stagnant surface water sources (ponds, traditional shallow wells) in rural areas. The female nematode discharges larvae from the host's skin when there is contact with water. The incubation period is usually between 10 to 14 months. There is no treatment or vaccine against the disease.
- Successful disease control strategies conducted by the endemic countries and an international coalition of partners has pushed Dracunculiasis towards eradication. During 2017, only 30 cases of Guinea worm were reported to WHO, worldwide, compared to 892 000 that were reported in 1989, showing a reduction of 99.99%.
- 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
- Africa remains the only affected continent, with 3 endemic countries as of 2018: Chad, Ethiopia and Mali.
- Since, 2012, emerging worms from animals, mostly dogs, and in a few cases, cats and baboons, have been reported in the remaining endemic countries and confirmed in laboratory at WHO Collaborating Centre at CDC, USA (WHO Collaborating Centre at CDC for Dracunculiasis Eradication), as Dracunculus medinensis. Accordingly, Dracunculiasis Eradication, which was previously based on interrupting transmission in human, will now include interrupting transmission in both human and animal hosts.

Surveillance goal

- Active detection and containment of cases 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 cases in high-risk areas and promptly follow-up and investigate all rumours of dracunculiasis (within 24 hours of notification).
- Report all imported cases to countries or areas of origin for further follow up investigation to trace the source of infection to act on.
- Integrate dracunculiasis surveillance in National Surveillance systems and continue to report weekly/monthly according to national reporting system
- Continue publicity of the cash reward for reporting Dracunculiasis
- Systematically document and properly store information /surveillance data related to Guinea worm disease surveillance, to serve as evidence for future certification, and beyond until Global eradication is declared.

From 2011 when Sudan was split into Sudan and South Sudan, the number of countries is now counted as 21, with 17 of them in the WHO Region for Africa

Standard case definitions

Rumour

- Information about the occurrence of Guinea worm disease (Dracunculiasis) from any source.

Suspected case

- A person presenting a skin lesion with itching or blister living in an endemic area or risk areas of Guinea worm, with the emergence of a worm.

Confirmed case

- A case of Guinea worm disease is a person exhibiting a skin lesion with emergence of a Guinea worm, *ideally with laboratory confirmation.* That person is counted as a case only once during the calendar year, i.e., when the first Guinea worm emerged from that person. All worm specimens should be obtained from each case patient for laboratory confirmation and sent to CDC. All cases should be monitored at least twice per month during the remainder of the calendar year for prompt detection of possible additional Guinea worms.

Respond to alert threshold

As a disease targeted for eradication, every rumour or suspected case of Guinea worm disease is an emergency.

- Follow up and investigate any rumour of dracunculiasis (within 24 hours of notification), using the national programme guidelines and WHO recommended forms, in order to determine whether or not there is a suspected case requiring further follow-up, monitoring and specimen collection for laboratory investigation.

If a single case is suspected:

- Report the case according to national program guidelines for eradication of Dracunculiasis.
- Treat the wound (if any) to decrease disability associated with painful leg lesions.
- Collect and preserve specimen of any emerged worm according to WHO /National guidelines for specimen handling, and send to WHO Country office for onward transmission to WHO Collaborating Centre at CDC for laboratory analysis
- Conduct case investigation to confirm risk factors.
- Improve access to safe water according to national guidelines.

Analyse and interpret data

Time: Graph cases monthly.

Place: Plot distributions of localities (communities) from which cases have been reported.

Person: Count monthly cases and analyse age distribution. Use data to forecast interventions. Report monthly to next levels.

Laboratory confirmation

A clinical diagnosis is usually made when the blister has ruptured, and the anterior end of the female worm can be seen, and worm emerges. Current programme standards require that the emerged worm is sent to the laboratory for confirmation as *D. medinensis*. Several other worms emerging from the skin may mimic Guinea worm disease, notably onchocerciasis and sparganosis, and should be differentiated from dracunculiasis through laboratory confirmation. Collect and preserve any emerged specimen according to WHO/ National guidelines for specimen handling and send to WHO Country office for onward transmission to WHO Collaborating Centre at CDC for laboratory analysis (mandatory).

References

- Dracunculiasis or guinea-worm, Geneva, World Health Organisation, WHO/CDS/CEE/DRA/99.2, 1999 and WHO/WER N°37 September 2003
- Control of Communicable Diseases Manual, 18th Edition
- District Laboratory Practice in Tropical Countries, Cambridge
- Dracunculiasis Eradication:(http://www.who.int/dracunculiasis/surveillance-control/en/)
- Weekly epidemiological Records, 2018, 93, 33–44(http://www.who.int)
- Reports of meetings of International Task Force for Disease Eradication (ITFDE)(https://www.cartercenter.org/news/publications/health/itfde_reports.html)

11.13 Ebola or Marburg Virus Diseases

Background

- The Ebola and Marburg viruses are both filoviruses.
- Almost 3,000 cases of Ebola with over 1,900 deaths have been documented since the Ebola virus was discovered in 1976. Major Ebola outbreaks have occurred in Sudan, DRC, Cote d'Ivoire, Gabon, Uganda and Congo.
- More than 500 cases of Marburg with over 400 deaths were reported during outbreaks of Marburg virus that occurred in DRC (1998-2000), Angola (2004-2005) and Uganda (3 cases in 2007).
- These two viruses are transmitted by direct contact with the blood, secretions, organs or other body fluids of infected persons. The infection of humans with Ebola virus through the handling of infected chimpanzees, gorillas, and forest antelopes (alive and dead) has been documented.
- Ecological studies are in progress to identify the natural reservoirs of both Marburg and Ebola. There is evidence that fuirt 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.
- Support of prevention efforts such as social distancing and vaccination when available.
- Monitoring case fatality, assess spread of illness (chains of transmission), and death.
- To guide the support and care of survivors

Standard case definition

Routine Surveillance:

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.

Community-based surveillance:

- Alert case

a. Illness with onset of fever and no response to treatment of usual causes of fever in the area; OR

b. At least one of the following signs: bleeding, bloody diarrhoea, bleeding into urine; OR

c. Any sudden death

- If an alert case (living or dead) is identified, report the case to a surveillance team or to the closest health centre
- This definition of "alert cases" for Ebola or Marburg virus disease has been developed for use by the community or community-based volunteers. It may be used for community-based surveillance during the pre-epidemic phase and during the outbreak.

Note: During an outbreak, case definitions are likely to be adapted to new clinical presentation(s) or different modes of transmission related to the local event

In Outbreak setting, the following standard case definitions may guide appropriate detection of cases:

- Suspected case: Any person, alive or dead, suffering or having suffered from a sudden onset of high fever and having had contact with: - a suspected, probable or confirmed Ebola or Marburg case; - a dead or sick animal (for Ebola) - a mine (for Marburg)
- OR
- Any person with sudden onset of high fever and at least three of the following symptoms: - headaches - lethargy - anorexia / loss of appetite - aching muscles or joints - stomach pain - difficulty swallowing - vomiting - difficulty breathing - diarrhea - hiccups;

OR

- Any person with inexplicable bleeding;

OR

- Any sudden, inexplicable death;

OR

- A person (alive or dead) suffering or having suffered from a sudden onsite of high fever and having had contact with: a dead or sick animal (for Ebola); a mine (for Marburg)

Note: During epidemics, most infected patients do not show hemorrhagic symptoms, therefore, the case definition for suspected or confirmed case does not include it.

In Outbreak setting, the following standard case definitions may guide appropriate detection of cases:

- Suspected case: Any person, alive or dead, suffering or having suffered from a sudden onset of high fever and having had contact with: - a suspected, probable or confirmed Ebola or Marburg case; - a dead or sick animal (for Ebola) - a mine (for Marburg)

OR

- Any person with sudden onset of high fever and at least three of the following symptoms: - headaches - lethargy - anorexia / loss of appetite - aching muscles or joints - stomach pain - difficulty swallowing - vomiting - difficulty breathing - diarrhea - hiccups;

OR

- Any person with inexplicable bleeding;

OR

- Any sudden, inexplicable death;

OR

A person (alive or dead) suffering or having suffered from a sudden onsite of high fever and having had contact with: a dead or sick animal (for Ebola); a mine (for Marburg)

Note: During epidemics, most infected patients do not show hemorrhagic symptoms, therefore, the case definition for suspected or confirmed case does not include it.

Probable case:

Any suspected case evaluated by a clinician;

OR

Any deceased suspected case (where it has not been possible to collect specimens for laboratory confirmation) having an epidemiological link with a confirmed case Note: if laboratory specimens are collected in due time during the illness, the preceding categories are reclassified as "laboratory confirmed" cases and "non-case".

Laboratory confirmed case: Any suspected or probably cases with a positive laboratory result. Laboratory confirmed cases must test positive for the virus antigen, either by detection of virus RNA by reverse transcriptase-polymerase chain reaction (RT- PCR), or by detection of IgM antibodies directed against Marburg or Ebola.

Non-Case: Any suspected or probable case with a negative laboratory result. "Noncase" showed no specific antibodies, RNA or specific detectable antigens

Respond to alert threshold:

If a single case is suspected:

If a single case is suspected:

- Report case-based information immediately (phone or text with information from generic case investigation form) to the appropriate levels.
- Collect specimen to confirm the case(s). Carefully complete specimen request form and mark containers to warn laboratory of risk.
- Suspected cases should be isolated from other patients and strict barrier nursing techniques implemented. Eliminate body fluid exposure and wear VHF appropriate PPE.
- Standard precautions should be enhanced throughout the healthcare setting.
- Conduct case-contact follow-up (using case investigation form) and active case search for additional cases. Begin contact tracing (see contact tracing forms)

Begin or enhance death reporting and surveillance

Respond to action threshold :

If a single case is confirmed:

- Notify next level and WHO
- 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.
- Psychosocial support for family, community, and staff.
- Begin screening procedures for fever and VHF-like symptoms at the entrances to health care facilities with hand washing
- Request additional help from other levels as needed.
- Establish isolation ward to handle additional cases that may come to the health centre.Ensure there is a barrier between suspected cases and confirmed cases in an isolation unit.
- Quarantine high-risk contacts with home support during the incubation period. Low risk contacts under daily follow-up should be encouraged to limit their movements
- Begin surveillance and screening of dead bodies including: any individual aged 5 years or more, dying within 14 days of symptom onset from an indeterminate cause, OR still births.)
- Treat accompanying similar symptoms, in particular malaria, typhoid, fever, louse-borne typhus, relapsing fever or leptospirosis.
- Iplement IPC measurea and avoid nosocomial transmission by strict implementation of barrier nursing. If barrier nursing material is not available, avoid any invasive procedure (e.g. blood sampling, injections, placement of infusion lines, or nasogastric tubes) and put on at least one layer of gloves for any direct contact with the patient; double gloving is advised during invasive procedures (e.g., surgery) that poses an increased risk for blood exposure.
- There is no specific treatment for either disease. Severe cases require intensive supportive care, as patients are frequently dehydrated and in need of intravenous fluids or oral rehydration with solutions containing electrolytes.

For EVD, a range of potential treatments including blood products, immune therapies and drug therapies are currently being evaluated.

Analyse and interpret data	
Person: Implement immediate case-based reporting of cases and deaths. Analyse age and sex distribution. Assess risk factors and plan disease control interventions accordingly. **Time**: Graph cases and deaths daily/weekly. Construct an epidemic curve during the outbreak. **Place**: Map locations of cases' households.	
Laboratory confirmation	
Diagnostic test	Laboratory confirmed cases must test positive for the Ebola or Marburg virus antigen, either by detection of virus RNA by reverse transcriptase-polymerase chain reaction (RT- PCR), or by detection of IgM antibodies directed against Ebola/Marburg.
Specimen	For ELISA: Whole blood, serum or plasma For RT-PCR: Whole blood or blood clot, serum/plasma or tissue For immunohisto-chemistry: Skin or tissue specimens from fatal cases **NB: RDTs theoretically can be performed in any health care setting and without additional equipment, however, use of an RDT may result in both false positive and false negative test results. A nucleic-acid based (e.g., PCR) diagnostic assay, such as GeneXpert, must be used to confirm the RDT result. Recent guidance from WHO recommends that antigen detection RDT's for VHDs have no role in the routine management of VHDs in settings where PCR testing is available. However, they may have utility in settings without laboratory infrastructure and where specimens cannot be rapidly transported to a diagnostic laboratory, if their benefits and limitations are understood.**
When to collect	Collect specimen from the first suspected case. If more than one suspected case, collect until specimens have been collected from 5 to10 suspected cases.
How to prepare, store, and transport	HANDLE AND TRANSPORT SPECIMENS FROM SUSPECTED VHF PATIENTS WITH EXTREME CAUTION. WEAR PROTECTIVE CLOTHING AND USE BARRIER PRECAUTIONS. For ELISA or PCR: ▪ Refrigerate serum or clot ▪ Freeze (-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.
How to prepare, store, and transport	HANDLE AND TRANSPORT SPECIMENS FROM SUSPECTED VHF PATIENTS WITH EXTREME CAUTION. WEAR PROTECTIVE CLOTHING AND USE FULL PPE. 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

- *WHO Interim Guidelines -Case Definitions Recommendations for Ebola and Marburg Virus diseases. 9th August 2014*
- *Interim Infection Control Recommendations for Care of Patients with Suspected or Confirmed Filovirus (Ebola, Marburg) 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 Organisation. 1997.*

11.14 Epilepsy

Background

- Epilepsy is defined as the recurrence of, at least, two epileptic seizures with sudden occurrence of abnormal signs which could be: motor, tonic, sensitive, sensorial, neuro-vegetative, or psycho-behavioral. These symptoms could or could not be associated to a loss of conscience. It can appear at any age.
- Epilepsy is the most common result of brain cells disturbance that lead to excessive nerve-cell discharges. According to the disturbance on some or many groups of cells, seizures could be partial or generalized.
- Seizures with tonic-clonic muscle movements are named convulsion or fit or attack. Convulsion can appear at any age; all convulsions are not systematically epilepsy.
- Epilepsy is frequent in the Region and its prevalence rate range from 2.2 to 58 per 1000. Studies from five sub-Saharan African countries showed an incidence ranging from 64 to 156 per 100,000 person/year.
- This higher incidence may be a consequence of many risk factors which are related with predisposing factors such as poor perinatal care, head trauma, consanguinity.
- Many etiological factors are related with communicable diseases (malaria, tuberculosis, meningitis, neurocysticerocisis and HIV), non communicable diseases (high blood pressure, diabetes, alcoholism and illicit drug use), poorer medical facilities, poorer general health and a lower standard of living. Misunderstanding linked to cultural beliefs, sigma and exclusion do not facilitate appropriate care.
- Epilepsy substantially increases mortality risk, particularly in conditions of later detection due to lack of well trained health workers to diagnose and treat neurological disorders.
- Death and injury occur primarily due to status epilepticus (especially in the case of abrupt medication withdrawal), burns and drowning.

It has been estimated that in developing countries, up to 80% of people with epilepsy are not receiving treatment, or are often not even identified. While the etiological diagnosis of the epilepsies may be more difficult in developing countries, due to limited investigative resources, many can be diagnosed on the basis of simple clinical and epidemiological knowledge.

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	
Analyse 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	
Laboratory confirmation	
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

11.15 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
- 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*

11.16 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; 2009. The 1918 pandemic killed an estimated 40–50 million people. It is predicted that a pandemic of equivalent magnitude could kill 62 million people, 96% of them in developing countries.
- Successful containment or control of pandemic influenza is dependent on early recognition of sustained human-to-human transmission of a new influenza A virus. Countries have been encouraged as part of pandemic preparedness planning to enhance surveillance to (i) detect the emergence of new disease; (ii) characterize the disease (epidemiology, clinical manifestations, severity); and (iii) monitor its evolution and start control measures.
- **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 18 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 every human case of influenza caused by a new subtype.

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

Include IHR case definition for reporting of human infection with a novel influenza virus

For some zoonotic influenza subtypes, specific cases definitions are existing such as for H5N1 and H7N9 Suspected H5N1 case:

Any person presenting with unexplained acute lower respiratory illness with fever (>38 °C) 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 align with respiratory investigation guidance

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.
- 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.

Analyse and interpret data cross check against investigation guidance

Time:	Graph weekly cases and deaths, construct an epidemic curve. Construct timeline with onset dates, exposure dates, date of death and possible interactions between suspect and confirmed cases.
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. Analyse 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, exposure history.

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 ideally within 3 days of the onset of symptoms but up to 10 days after onset, 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 collected; If possible they 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 memdia. Media that could be used for a variety of viruses are commercially available. ▪ Specimens in viral transport medium for viral isolation should be kept at 4°C and transported to the laboratory promptly. If specimen is transported within 2 days, it may be kept at 4°C; otherwise should be frozen at or below -70 °C until transported to the laboratory. Repeated freezing and thawing must be avoided to prevent loss of infectivity. ▪ Sera may be stored at 4°C for approximately one week, but thereafter should be frozen at -20°C ▪ Transport of specimens should comply with the WHO guidelines for the safe transport of infectious substances and diagnostic specimens

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

- *WHO guidelines for global surveillance during an influenza pandemic,* April 2009.
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- *WHO guidelines for investigation of human cases of avian influenza A(H5N1),* 2007
- *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
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- *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.
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11.17 Hypertension

Background

- Hypertension or high blood pressure (HBP) is a chronic condition in which the blood pressure in the arteries is elevated. It is classified as either primary (essential) or secondary. 'Primary' Hypertension is elevated blood pressure where no medical cause is found. 'Secondary' Hypertension is caused by other conditions that affect the arteries, heart, endocrine system or kidneys.
- Hypertension is a major risk factor for cardiovascular diseases such as heart attack or stroke. According to The World Health Report 2001, cardiovascular disease related deaths are increasing in the African Region, and in 2000 accounted for 9.2% of the total deaths in the African Region. Prevalence ranges from 25% to 35% in adults aged 25 to 64 years.
- Hypertension affects approximately 1 billion worldwide and it is estimated that more than 20 million people in the African Region are affected.
- Major risk factors for hypertension are ageing, lack of physical activity, obesity, and a diet high in salt and fat. Other risk factors include; tobacco and alcohol use.
- Lifestyle modifications shown to lower BP include; weight reduction for individuals who are overweight or obese, reducing the amount of fat and salt in the diet, and eating more fresh fruits and vegetables, increased physical activity,

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 diagnosis 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.

Analyse and interpret data

Time: Graph cases quarterly to Analyse trends.

Place: Compare district trends with national and regional trends.

Person: Analyse the distribution of cases by age and other demographic factors.

*Data for non-communicable diseases is often Analysed for long term trends

Laboratory confirmation

Diagnostic is clinical.

Reference

- WHO, Atlas of heart disease and stroke, Geneva, World Health Organisation, 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/
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- 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/

11.18 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

An acute respiratory infection in a child or adult with:

- Sudden onset of fever > 38 °C AND
- And Cough
- with onset within the last 10 days.

A confirmed case of influenza is a case that meets the clinical case definition and is laboratory confirmed (laboratory results must be positive for influenza virus).

Respond to an alert threshold

If there is an unusual event (a cluster of deaths, for example) of respiratory infection, or if a single case of pandemic-prone acute respiratory disease is suspected

Unusual cases of influenza-like illness.

- Health-care workers with only occupational exposure risks develop SARI after providing care to patients with SARI.
- 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).

Analyse 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 s verity 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, Analyse age and sex distribution. Assess risk factors immediately

Place: Describe the degree of disruption of schools, health care infrastructure, workplace and point of entry (PoE). Ascertain whether any evidence exists that the virus may have increased it ability to cause human disease or improved its transmissibility. Also use trends of flu remedies and painkillers sales

Laboratory confirmation

Further technical information on the role of laboratory can be found in the WHO guideline on sentinel surveillance of influenza viruses

Reference

World Health Organisation. WHO surveillance case definitions for ILI and SARI. As of January 2014 [http://www.who.int/influenza/surveillance_monitoring/ili_sari_surveillance_case_definition/en/]

World Health Organisation – Acute Respiratory Infections http://www.who.int/vaccine research/diseases/ari/en/index.html

World Health Organisation – Influenza resources http://www.who.int/csr/disease/influenza/inforesources/en/index.html

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World Health Organisation - Guidelines for investigation of human cases of avian influenza A (H5N1), January 2007.

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11.19 Injuries (Road Traffic Accidents)

Background

- Injury is a physical damage resulting when the human body is briefly or suddenly subjected to levels of energy exceeding its physiological tolerance or the impairment in function resulting from the lack of one or more vital elements (water, air, warmth) .The energy causing the injury can be mechanical, electrical, thermal, radiant or chemical. Injury is classified as intentional and unintentional.
- All injuries account for 10% of the world's deaths. 5.8 million People die each year as a result of different types of injuries. Of the all systems that people have to deal with on a daily basis; road transport is the most complex and the most dangerous.
- Road traffic accidents result in unintentional injury.
- A traffic collision (motor vehicle collision, motor vehicle accident, car accident, or car crash) occurs when a road vehicle collides with another vehicle, pedestrian, animal, road debris, or other geographical or architectural obstacle. Traffic collisions can result in injury, property damage, and death.
- Worldwide, the number of people killed in road traffic crashes each year is estimated at 1.2 million, while the number of injured could be as high as 50 million.
- Road traffic injuries are a major but neglected global public health problem, requiring concerted efforts for effective and sustainable prevention.
- Road traffic injuries continue to be among the leading causes of death and disability among young people aged between 5 and 44 years and the leading cause of death in the category of people between 15-29 years. The majority of such deaths are currently among "vulnerable road users"-pedestrians, pedal cyclists and motorcyclists.
- Without increased efforts and new initiatives, the total number of road traffic deaths worldwide and injuries is forecast to rise by some 67% by 2020, and in low income and middle-income countries deaths are expected to increase by as much as 83%
- The African region has the highest fatality rate for road traffic crashes at 32/100 000 population. Road traffic injuries are preventable. Very substantial reductions in juries can be achieved by implementing measures which address risk factors (excessive and inappropriate speed, driving under the influence of alcohol, non-use of seat belts and child restraints, non- use of helmets for cyclists)

Surveillance goal

- Estimate and monitor incidence of road traffic injuries and related outcomes
- Identify risk factors and high risk areas to inform prevention policy and programs
- Evaluate programmes aimed at preventing road traffic injuries
- Establish alert thresholds for fatalities to allow health facility personnel review care and services provided to injured persons
- Establish incidence alert thresholds and monitor trends to enable district health personnel inform relevant stakeholders

Standard case definition

Road traffic injury: Any person who has sustained an injury as a result of a road traffic crash presenting for the first time.

Road traffic fatality: Any person killed immediately or dying within 30 days as a result of an injury crash.

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

Analyse and interpret data

Person: Analyse the distribution of cases by sex, age and other demographic factors

Time: Graphs to show monthly figures of cases and deaths, curves for the year to depict trends

Place: Plot location of cases and identify high risk areas

Laboratory confirmation

Imaging of the injured person - when required

Reference

- *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
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11.20 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.
- In Nigeria, 633 confirmed cases of Lassa fever was recorded with a case fatality rate (CFR) of 27% in 2018.
- 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 2-21 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 among hospitalised patients may exceed 50% during outbreaks.
- 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 if 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.

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: Any individual presenting with one or more of the following: malaise, fever, headache, sore throat, cough, nausea, vomiting, diarrhoea, myalgia, chest pain, hearing loss and either

a. History of contact with excreta or urine of rodents

b. History of contact with a probable or confirmed Lassa fever case within a period of 21 days of onset of symptoms OR Any person with inexplicable bleeding/hemorrhage.

Confirmed case of Lassa fever: A suspected case with laboratory confirmation (positive IgM antibody, PCR or virus isolation)

Probable case of Lassa fever: A suspected case (see definition above) who died or absconded without collection of specimen for laboratory testing.

Confirmed case: A suspected case with laboratory confirmation (positive IgM antibody, PCR or virus isolation)A suspected

Note: *During an outbreak, case definitions may be changed to correspond to the local event. It is important to note that*

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).
- Complete the case investigation form for all cases
- 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-bite 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.	
Analyse and interpret data	
▪ Person: Implement immediate case-based reporting of cases and deaths. Analyse age and sex distribution. Assess risk factors and plan disease control interventions accordingly. ▪ Time: Graph cases and deaths daily/weekly. Construct an epidemic curve during the outbreak. ▪ Place: Map locations of cases' households.	
Laboratory confirmation	
Diagnostic test	Presence of IgM antibodies against CCHF, or Lassa 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 all 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 NCDC.

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
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- 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

11.21 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. Seventeen years later, at the end of 2016, this prevalnec rate was reduced to 0.25 cases per 10 000 population and les than 25 000 registered cases
- Incubation period is 6 months to 20 years or more. Infection is probably frequent but clinical disease is rare, even among the closest contacts of patients. Multibacillary patients are most contagious, but infectiousness is reduced rapidly as soon as multiple drug therapy begins. Leprosy can be complicated by neuritis and leprosy reactions, resulting in impairment and disabilities of hands, feet, and eyes.
- Leprosy has historically been associated with social isolation and psychosocial consequences. This social stigma still persists in some countries in Africa.
- Some skin diseases such as tinea versicolor, mycosis, vitiligo, Scleroderma, psoriasis, systemic lupus erythematosus and Von Recklinghausen disease may be mistaken for leprosy.

Surveillance goal

- Observe national trends towards the leprosy elimination target, defined as a reduction in prevalence to less than 1 new case with grade-2 disabilities per 1 000 000 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, including active case search among household contacts of leprosy patients, especially during mass medicine administration or immunization campaigns.

Standard case definition

Suspected case:
A person showing one of three cardinal signs of leprosy: hypo-pigmented or reddish skin lesion, loss or decrease of sensations in skin patch, enlargement or peripheral nerve.

Confirmed case:
A person showing at least two cardinal signs of leprosy and who has not completed a full course of treatment with multidrug therapy (MDT).

Respond to alert threshold

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.

Analyse and interpret data

Time: Graph cases by date diagnosed and treatment begun.

Place: Plot cases by location of households and disease classification (MB or PB)

Person: Count newly detected cases monthly by the type of leprosy (MB or PB). Analyse age and disability distribution and treatment outcomes (cases cured, defaulted, relapsed).

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

- Global Leprosy strategy for the period 2016-2020 (SEA-GLP-2016.2)
- WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2

11.22 Lymphatic Filariasis

Background

- Lymphatic filariasis is the second leading cause of permanent and long-term disability worldwide. It affects over 120 million persons in 80 countries, and over 40 million persons are seriously incapacitated by the disease; 20% of the world population is at risk of infection. Of those infected, roughly 1/3 are in India, 1/3 in Africa, and the rest in the Americas, Asia, and the Pacific. In 1997, resolution WHA50.29 called for the elimination of lymphatic filariasis as a global public health problem. The strategy adopted is based on:
  - Reducing transmission below a threshold where new infection ceases to occur
  - Treatment of the problems associated with disability control and prevention.
- Causal agents:in Africa only the filariae Wuchereria bancrofti, Brugia malayi, and Brugia timori
- Modes of transmission: transmitted by various species of mosquitoes, these parasitic filarial worms lodge in the human lymphatic system, producing millions of immature microfilariae that circulate in the blood. Microfilariae appear in the peripheral blood after 3 to 6 months for Brugia malayi, 6 to 12 months for 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.

Analyse and interpret data

- Map the distribution of Lymphatic Filariasis and identify implementation units that will require mass drug administration
- Analyse the drug coverage in implementation units
- Assess the decline of parasitological indices microfilaremia before starting MDA and after at least four rounds of MDA till the criteria of less than 1% microfilaraemia in the population and less than 0.1% antigenaemia in school entry children is achieved

Laboratory confirmation

Diagnostic test	Night blood smear Filarial antigen test
Specimen	Blood smear Blood
When to collect	Night between10pm 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

11.23 Malaria

Background

- Malaria is an endemic tropical illness with fever following the bite of an infected female Anopheles mosquito which transmits the parasite. Five parasite species cause malaria in humans, namely: *Plasmodium falciparum (the most common), P. ovale, P. vivax, P. malariae and Plasmodium knowlesi.* Serious malarial infections are usually due to *P. falciparum* which may result in severe disease.
- Malaria is one of the leading causes of illness and death in many African countries. In most parts of Africa malaria transmission is largely seasonal. In areas of high transmission in Africa malaria is mainly a disease of children less than 5 years old and pregnant women. However, some countries have witnessed a dramatic reduction of malaria transmission and in such countries malaria has become a disease of all age groups and malaria epidemics are likely to occur.
- Worldwide, Malaria continues to be a public health burden with estimated 228 million malaria cases in 2018 and 405,000 deaths in the same year attributed to malaria. (WMR 2019) The malaria cases in 2018 were mostly in African Region (213 million or 93%), followed by the South-East Asia Region with 3.4% of the cases and the Eastern Mediterranean Region with 2.1% of cases. (WMR 2019) Nigeria accounts for 25% of the Global burden and according to the recent NDHS the prevalence of malaria in Nigeria is 23% with a range 2% in Lagos state and 52% in Kebbi state. (NDHS 2018)
- The incubation period from the time of being bitten to onset of symptoms is approximately 10 to 14 days. The incubation period may be longer, with non- *P. falciparum* species.

Surveillance goal

- Detect malaria cases promptly in areas of high transmission and to detect epidemics promptly in epidemic prone areas or in areas with a large population at risk.

Standard case definition

Uncomplicated malaria: The signs and symptoms of malaria are non-specific. However, clinical suspicion is based on fever or history of fever in the last 24 hrs and/or the presence of anaemia. The patient commonly complains of fever, headache, aches and pains elsewhere in the body and occasionally abdominal pain and diarrhoea. In a young child, there may be irritability, refusal to eat and vomiting. It is important to note that clinical diagnosis alone may result in over-diagnosis of malaria; hence**, parasitological confirmation is strongly recommended in all suspected cases**. Clinical signs may include amongst other symptoms:

- Elevated body temperature ≥ 37.5°C.
- Enlarged spleen or liver, especially in children.
- Pallor (children/pregnant women)
- Exclude signs of severe disease.

Severe malaria: Severe falciparum malaria is defined as one or more of the following occurring in the absence of an identified alternative cause, and in the presence of P falciparum asexual parasitaemia.

- Impaired consciousness: A Glasgow Coma Score <11 in adults or a Blantyre Coma Score <3 in children.
- Prostration: Generalized weakness so that the person is unable to sit, stand or walk without assistance
- Multiple convulsions: More than two episodes within 24hours
- Acidosis: A base deficit of >8 meq/L or, if unavailable, a plasma bicarbonate of <15mmol/L or venous plasma lactate > 5 mmol/L. Severe acidosis manifests clinically as respiratory distress- rapid, deep and laboured breathing.
- Hypoglycaemia: Blood or plasma glucose <2.2mmol/L (<40mg/dL).
- Severe malarial anaemia: A haemoglobin concentration < 5g/dL or a haematocrit of < 15% in children <12 years of age (<7g/dl and <20% respectively in adults) together with a parasite count >10,000/µL.
- Renal impairment: (acute kidney injury): Plasma or serum creatinine >265µmol/L (3mg/dL) or blood urea > 20 mmol/L
- Jaundice: Plasma or serum bilirubin > 50µmol/L (3mg/dL) together with a parasite count >100,000/ µL.
- Pulmonary oedema: Radiologically confirmed, or oxygen saturation <92% on room air with a respiratory rate >30/minute, often with chest indrawing and crepitations on auscultation.
- Significant bleeding: including recurrent or prolonged bleeding from nose, gums or venepuncture sites; hematemesis or melaena
- Shock: Compensated shock is defined as capillary refill ≥3 seconds or temperature gradient on leg (mid to proximal limb), but no hypotension. Decompensated shock is defined as systolic blood pressure less than 70 mm Hg in children or < 80 mm Hg in adults with evidence of impaired perfusion (cool peripheries or prolonged capillary refill)
- Hyperparasitaemia: Red blood cell P.falciparum parasitaemia >10%.

Respond to alert threshold

If there is an unusual increase in the number of malaria cases or deaths as compared to the same period in previous non-epidemic years:

- Report suspected epidemic to the next level,
- Treat with appropriate anti-malarial drugs according to national treatment guidelines
- Investigate the cause for the increase in cases
- Make sure cases in children age 2 months up to 5 years are managed according to National treatment guidelines/ IMCI guidelines.
- Conduct community education for prompt detection of cases and access to health facilities.

Respond to action threshold	
If the number of cases exceeds the upper limit of cases seen in a previous non-epidemic period in previous years: • Evaluate and improve, as needed, prevention strategies, such as use of LLIN and IRS for all at risk of malaria. • Ensure appropriate case management • Ensure adequate supplies and drugs are available in the health facilities	
Analyse and interpret data	
Time: Graph the number of cases by month/week. Construct an epidemic curve during epidemics. **Place:** Plot location of households for new cases and deaths. **Person:** Count the number of new malaria cases and deaths by month and Analyse by age group and time of onset.	
Laboratory confirmation	
Diagnostic test	▪ Microscopy: Presence of malarial parasites in blood films for suspected cases ▪ Malaria Rapid diagnostic test (mRDT): 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. The smears need to be well stained with Giemsa stain to facilitate the reading, (parasite staging, species identification and determination parasite counts ▪ Store stained and thoroughly dried slides at room temperature out of direct sunlight. *For rapid diagnostic test:* ▪ *Collect specimen and perform test according to manufacturers' instructions.*

Results	Thick and thin smear results can be available the same day of preparation. Microscopic examination of malarial slides may also reveal the presence of other blood-borne parasites. RDT result is ob- tained 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 Organisation. WHO/MAL/98.1084 ▪ *Basic Laboratory Methods in Medical Parasitology,* WHO, Geneva, 1991	

Malaria Continued...

Note: Setting an epidemic threshold:

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

1. Look at the number of malaria cases at a specific health facility or district by month/week for the past 5 years.
2. Determine the median for each month/week (for example, each January for the last 5 years). Rank the monthly/weekly data for each month/week for the five years in ascending order. Identify the number in the middle of each month's/week's series for the five years. This is the median. Repeat this process for each month/week in the five years.
3. Determine the 3rd Quartile for the monthly/weekly series by identifying the 4th highest number from the bottom in each data series (since data is ranked in ascending order). This is the 3rd Quartile representing the upper limit of the

expected normal number of malaria cases.

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

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

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

Note: Please note that to ensure early detection and control of malaria epidemics; it is preferable to use weekly surveillance data in Malaria epidemic prone areas.

In areas in malaria pre-elimination or elimination phases a single case of locally transmitted malaria should lead to proactive interventions, including active case search in the locality where the case originated.

Source: WHO/AFRO Regional Malaria Program

11.24 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).

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.

Analyse and interpret data

Time: Graph cases monthly to Analyse trends and weekly in emergency

Place: Plot location of households/community with cases

Person: Count monthly/weekly cases and Analyse age and gender distribution

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

- 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 Organisation and the United Nations Children's Fund

11.25 Maternal Deaths

Background

- The death of a woman during pregnancy or within 6 weeks (42 days) of childbirth or termination of pregnancy from any cause related to pregnancy or its management is termed a maternal death. (NB. Those due to accidental or incidental causes are not considered as maternal deaths)
- Globally, about 80% of maternal deaths are due to; severe bleeding (mostly bleeding postpartum), infections (also mostly soon after delivery), hypertensive disorders in pregnancy (eclampsia) and obstructed labor. Complications after unsafe abortion cause 13% of maternal deaths.
- Across the developing world, maternal mortality levels remain too high, with more than 500,000 women dying every year as a result of complications during pregnancy and childbirth. About half of these deaths occur in sub-Saharan Africa where a woman's lifetime risk of maternal death is 1 in 22, compared with 1 in 8,000 in industrialized countries. In Nigeria the lifetime risk of maternal death is 1 in 34 women (NDHS, 2018).
- 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.
- SDG reporting in 2030 demands active surveillance, and counting of maternal deaths. The report is no longer proportionate as was in the MDGs (Reduce by 75%), Rather countries will report pegged on an actual number - in that no country should have MMR >70 deaths/ 100 000 live births
- Review of progress towards MDG 5 indicates that most African countries were not able to meet MDG by 2015. Intensified actions and increased investments are required to improve the coverage and quality of maternal health care services and addressing issues and factors contributing to these deaths are key if we are to achieve SDG

Surveillance goal

- Active surveillance for improved and accurate identification and reporting of maternal deaths at community and facility level
- Estimate and monitor maternal mortality rates.
- Identify underlying causes and contributing factors and high-risk areas for maternal mortality to inform program decisions.
- Evaluate programs aimed at reducing maternal mortality.

Standard case definition

The death of a woman while pregnant or within 42 days of the delivery or termination of the pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.

Respond to alert threshold

- After determining that the death of a woman occurred during pregnancy or within 42 days of its termination, the initial notification of the suspected death should be done immediately (within 24 hours), by the fastest means possible
- Every maternal death is significant and this puts the alert threshold at ONE (1)
- The health facility should contact the district authority and provide information about the IDSR Case Alert form. Moreover, the health facility maternal death review committee is required to review the case within 7 days
- The initial notification should be followed by a written report using a maternal death review form; and this should be shared with the district or state/ regional MPDRS coordinator/desk officer
- MDR should be anonymous and unlinked; and the reports should not be used for disciplinary action or litigation
- The initial notification should be followed by a written report using a maternal death review form/case investigation form.

Recommended public health action

- Every death of a woman of Reproductive age should be investigated to determine her pregnancy status and thereby establish whether it is a maternal death or not
- Surveillance for maternal deaths should be conducted not just in the labour wards, but in the community, and all service areas where women are seen or die.
- Monitor trends and respond to any maternal death based on recommendations from the Maternal death review
- Increase availability and use of antenatal care, and skilled birth attendance
- Implement evidence based high impact essential interventions for maternal health
- Educate and engage communities on emergency preparedness and complication readiness; including evidence based nutrition and dietary interventions for safe pregnancy and childbirth
- Address socio cultural norms and practices that negatively impact on maternal health
- Ensure EmOC coverage of >80 % with recommended signal functions provided by level of care

Analyse 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 Analyse the distribution.

Person: Analyse 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; ICD MM;

http://apps.who.int/iris/bitstream/handle/10665/70929/9789241548458_eng.pdf;jsessionid=862B3C6054CED65E30EDE6605FFAEDF4?sequence=1

WHO Technical guidance for MDSR; MEBC guidance
UNICEF http://www.unicef.org/index.php

11.26 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 the African Region of the WHO, in line with the Regional measles elimination goal: immediate case-based reporting of suspected cases and deaths of fever with rash illness; confirm all suspected measles cases with laboratory test (serum IgM).

Standard case definition

Suspected case:

Any person with fever and maculopapular (non-vesicular) generalized rash and cough, coryza or conjunctivitis (red eyes) or any person in whom a clinician suspects measles.

Confirmed case:

A suspected case with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an outbreak.

Respond to alert threshold

If an outbreak is suspected:

- Report suspected case to the next level.
- Collect blood sample for confirming the outbreak.
- Treat cases with oral rehydration, vitamin A, and antibiotics for prevention of bacterial super-infection. Use airborne isolation precautions where feasible.
- Investigate the case or outbreak to identify causes for outbreak.

Respond to action threshold

If an outbreak is confirmed:

- Improve routine vaccine coverage through the EPI, and lead supplemental vaccination activities in areas of low vaccine coverage.
- Mobilize the community early to enable rapid case detection and treatment.
- Provide Vitamin A:
- Dose 1: immediately, Dose 2: next day
- Age: 0-6mo=50,000IU, 7-11 mo = 100,000IU; ≥12mo=200,000IU

Analyse and interpret data

Time: Graph weekly cases and deaths. Construct epidemic curve for outbreak cases.

Place: Plot location of case households.

Person: Count total cases and Analyse by age group and immunization status.

Laboratory confirmation

Diagnostic test: Presence of IgM antibodies to measles virus in serum.

Specimen : Serum, Whole blood, gingival fluid, throat swab

When to collect the specimen

- Collect specimens between the 3rd day of the rash and 28th day after onset of rash.
- Collect blood samples on 5 suspected measles cases when the number of cases exceeds the measles outbreak threshold (usually more than 5 cases in a district in a month).
- In countries with an elimination target:
- Collect specimen from every suspected case of measles
- Collect serum for antibody testing at first opportunity or first visit to the health facility

How to prepare, store and manage the specimen

- For children, collect 1 to 5 ml of venous blood depending on size of child. Collect into a test tube, capillary tube or microtainer.
- Separate blood cells from serum. Let clot retract for 30 to 60 minutes at room temperature. Centrifuge at 2000 rpm for 10-20 minutes and pour off serum into a clean glass tube.
- If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clot retracts. Pour off serum the next morning.
- If no centrifuge and no refrigerator, let blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle). Pour off serum into a clean tube.
- Store serum at 4°C.
- Transport serum samples using appropriate packaging to prevent breaking or leaks during transport.

Results

The specimen should arrive at the laboratory within 3 days of being collected. Results are usually available after 7 days.

If as few as 2 out of 5 suspected measles cases are laboratory confirmed, the outbreak is confirmed.

Avoid shaking of specimen before serum has been collected.

To prevent bacterial overgrowth, ensure that the serum is poured into a clean glass test tube. The test tube does not need to be sterile, just clean.

Transport the serum in an EPI hand vaccine carrier to 4°C to 8°C to prevent bacterial overgrowth (up to 7 days). If not refrigerated, serum stored in a clean tube will be good for at least 3 days.

Reference

- "Response to measles outbreaks in measles mortality reduction settings" http://apps.who.int/iris/bitstream/10665/70047/1/WHO_IVB_09.03_eng.pdf
- WHO–recommended standards for surveillance of selected vaccine-preventable diseases. WHO/V&B/03.01 http://apps.who.int/iris/bitstream/10665/68334/1/WHO_V-B_03.01_eng.pdf?ua=1
- World Health Organisation. Regional Office for Africa. African Regional guidelines for measles and rubella surveillance- Revised April 2015. http://www.afro.who.int/index.php?option=com_docman&task=doc_download&gid=10814&Itemid=2593

11.27 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

Suspected case: Any person with sudden onset of fever (>38.5°C rectal or 38.0°C axillary) and one of the following signs: neck stiffness, altered consciousness or other meningeal 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 district as well as any contiguous districts in alert phase.
- Mobilize community to permit early case detection and treatment, and improve vaccine coverage during mass vaccination campaigns for outbreak control.
- Continue data collection, transmission and analysis.
- Maintain regular collection of 5-10 CSF specimens per week throughout the epidemic season in all affected districts to detect possible serogroup shift.
- Treat all cases with appropriate antibiotics as recommended by National protocol.

Analyse and interpret data

Time: In meningitis belt countries during epidemic season, graph weekly cases and deaths. Otherwise, graph monthly trends in cases and deaths. Construct an epidemic curve for outbreak cases.

Place: In epidemics (not in endemic situations), plot location of case households and estimate distance to the nearest health facility.

Person: Count total sporadic and outbreak cases. Analyse age distribution. Target case fatality rate: <10%

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 No 38, 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 meningococci diseases. meningococcal disease. WHO Practical Guidelines, 2nd Edition. WHO/EMC/BAC/98.3

Laboratory Methods for the diagnosis of Meningitis caused by Neisseria meningitidis, Streptoccus pneumoniae and Heamophilus Influenza. WHO document WHO/CDS/EDC/99.7 WHO, Geneva

11.28 Middle East respiratory syndrome (MERS)

Background

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

Surveillance Goal

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

Standard case definition

http://www.who.int/csr/disease/coronavirus_infections/technical-guidance-surveillance/en/

The following people should be investigated and tested for MERS-CoV

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

   AND any of the following:

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

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

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

5. Testing should be according to local guidance for management of community-acquired pneumonia. Examples of other aetiologies include Streptococcus pneumoniae, Haemophilus influenzae type B, Legionella pneumophila, other recognized primary bacterial pneumonias, influenza, and respiratory syncytial virus.
6. For a map of the Middle East, see: http://www.un.org/Depts /Cartographic/map/profile/mideastr.pdf

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

2. A person with an acute respiratory infection, with history of fever and cough and indications of pulmonary parenchymal disease (e.g. pneumonia or ARDS), based on clinical or radiological evidence, and who has travelled within 14 days before onset of illness to the Middle East[2] or countries where MERS-CoV is known to be circulating in dromedary camels or where human infections have recently occurred.
3. Individuals with acute respiratory illness of any degree of severity who, within 14 days before onset of illness, had any of the following exposures (Note: see section on Recommendations for testing in clusters associated with health care settings):
   a. close physical contact with a confirmed or probable case of MERS-CoV infection, while that patient was ill;
   b. a healthcare facility in a country where hospital-associated MERS-CoV infections have been reported;
   c. direct contact with dromedary camels or consumption or exposure to dromedary camel products (raw meat, unpasteurized milk, urine) in countries where MERS-CoV is known to be circulating in dromedary camel populations or where human infections occurred as a result of presumed zoonotic transmission.
4. Countries in the Middle East[2] are also strongly encouraged to consider adding testing for MERS-CoV to current testing algorithms as part of routine sentinel respiratory disease surveillance and diagnostic panels for pneumonia.

Confirmed case

WHO case definitions for MERS-CoV can be found here http://www.who.int/entity/csr/disease/coronavirus_infections/case_definition/en/index.html

A person with laboratory confirmation of MERS-CoV infection,[1] irrespective of clinical signs and symptoms.

Probable case

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

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7. A 'cluster' is defined as two or more persons with onset of symptoms within the same 14 day period, and who are associated with a specific setting such as a classroom, workplace, household, extended family, hospital, other residential institution, military barracks or recreational camp.

8. Close contact' is defined as:
   - Health care associated exposure, including providing direct care for MERS-CoV patients, working with health care workers infected with MERS-CoV, visiting patients or staying in the same close environment of a MERS-CoV patient.
   - Working together in close proximity or sharing the same classroom environment with a with MERSCoV patient
   - Traveling together with MERS-CoV patient in any kind of conveyance
   - Living in the same household as a MERS-CoV patient

   The epidemiological link may have occurred within a 14-day period before or after the onset of illness in the case under consideration.

Notes

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

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

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

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

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

[4] Inconclusive tests may include:

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

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

Respond to alert threshold

If a single case is suspected:

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

Refer to the WHO case reporting form

Respond to action threshold

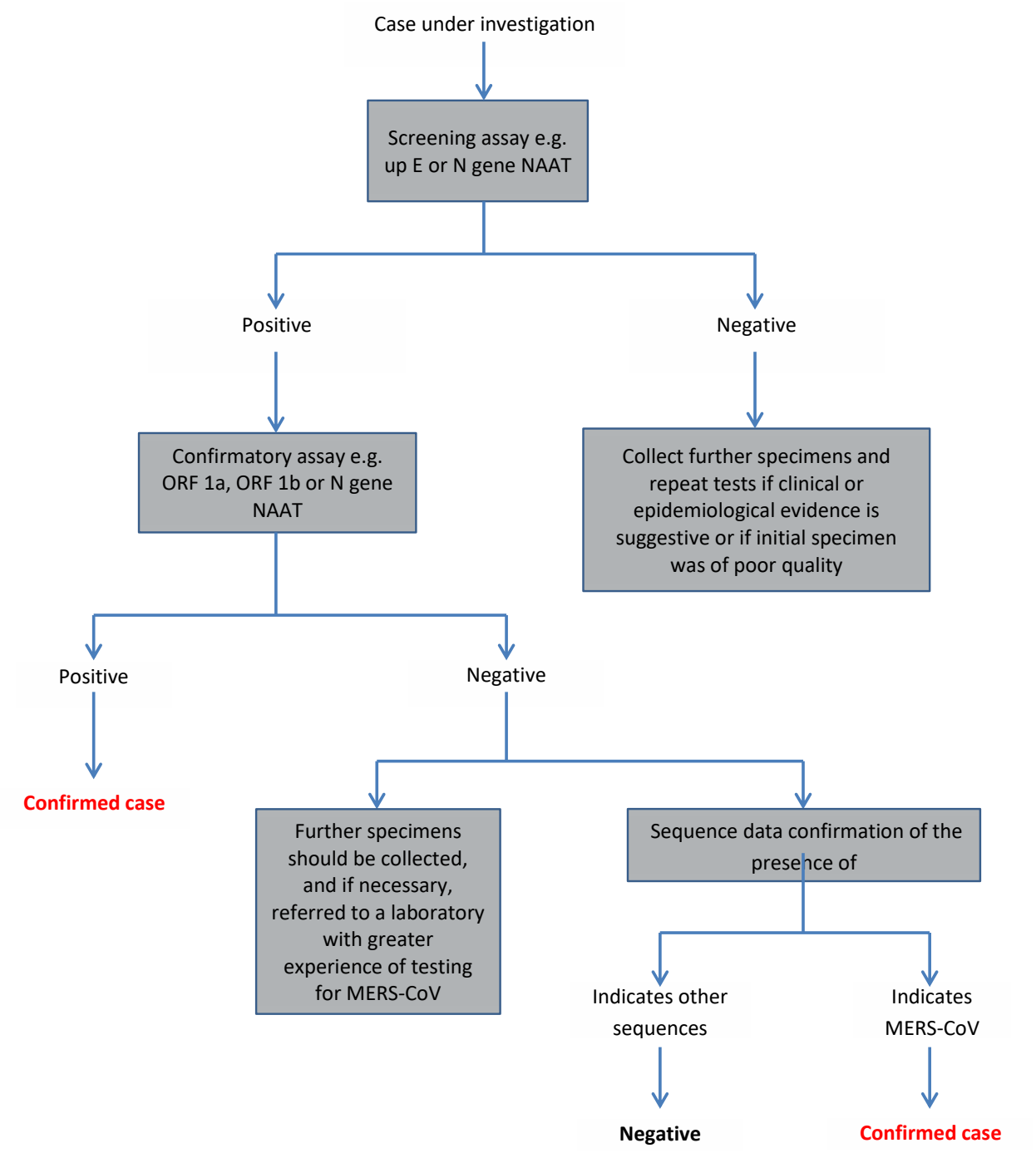
If a single case is confirmed:

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

Patient	Test	Type of sample	Timing	Storage and transportation	Remarks
Symptomatic	NAAT	**Lower respiratory tract** - sputum - aspirate - lavage **Upper respiratory tract** - naso pharyngeal and - oro pharyngeal swabs - naso pharyngeal wash/naso pharyngeal aspirate	Collect on presentation. To confirm clearance of the virus, sample collection to be repeated until the results are negative on 2 sequential samples.	If the specimen will reach the laboratory in less than 72 hours, store and ship at 4°C. If the specimen will reach the laboratory in more than 72 hours, store at -20°C or ideally□80°C and ship on dry ice or liquid nitrogen.	Follow national regulations for in-country shipping and WHO guidance for international movement of specimens including the use of triple package systems.
Symptomatic	Serology	Serum for serological testing. Only if NAAT is not available	Paired samples are necessary for confirmation with the initial sample collected in the first week of illness and the second ideally collected 3-4 weeks later. If only a single serum sample can be collected, this should occur at least 3-4 weeks after onset of symptoms for determination of a probable case.	As above, with storage and shipping at -20°C being sufficient.	As above.

Asymptomatic Contact (particularly in health-care centre associated outbreaks or other outbreak settings involving high-intensity contact. Testing asymptomatic individuals not associated with outbreaks is not recommended	NAAT	Nasopharyngeal and oropharyngeal swabs; lower respiratory tract specimens if possible.	Within 14 days of last documented contact.	As above for NAAT.	As above.
	Serology	Serum	Baseline serum taken as early as possible within 14 days of contact and convalescent serum taken 3-4 weeks after last contact. If only a single sample is possible, collect at least 3-4 weeks after last documented contact	As above for serology.	As above.

Figure 1. Algorithm for testing cases under investigation for MERs-COV by NAAT



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

Analyse and interpret data

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

Place: Map of suspected and confirmed human and animal cases by geographical area (district)

Person: Table showing the number of suspected / probable / confirmed cases by date, age and sex

Laboratory confirmation

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

Laboratory guidance for MERS-CoV http://www.who.int/entity/csr/disease/coronavirus_infections/technical-guidance-laboratory/en/index.html

Recommendations for specimen collection

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

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

Reference

Surveillance (link)

WHO Guidance

- Case definition for reporting MERS-CoV confirmed cases to WHO (link)
- Surveillance for human infection with MERS-CoV (link)
- Investigation of cases of human infection with MERS-CoV (link)
- MERS-CoV Initial Interview questionnaire of cases (link)
- Case Summary Form for rapid reporting of MERS-CoV probable & confirmed cases to WHO (link)
- WHO Global Summary and Risk Assessments

The latest WHO MERS-CoV global summary and risk assessment and archives

Investigation Tools

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

Laboratory

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

Case Management and IPC

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

Additional resources

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

Travel

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

11.29 Monkey Pox

Background

- Monkeypox is a rare, viral, zoonotic orthopoxvirus disease that has a similar but milder disease presentation as (now eradicated) smallpox in humans. It is usually a self-limiting disease but the case-fatality rate can be up to 10%, particularly among children.
- Monkeypox primarily occurs in the rain forests in West and Central Africa. The primary animal reservoir is unknown but it has been detected in a range of small mammal species, particularly rodents, and monkeys. Animal species in which evidence of monkeypox virus has been found include Gambian giant rats, squirrels, dormice and monkeys.
- Communities living in the West and Central African rainforest regions need to be educated about avoiding direct contact with animals, especially wild species. Efforts to prevent transmission in endemic regions should focus on thoroughly cooking all animal products (blood, meat) before eating.
- Human-to-human transmission is limited (no evidence that this mode of transmission alone can sustain monkeypox in human populations) and occurs via prolonged contact with respiratory droplets and contact with lesions or bodily fluids that contain the virus. Household members and health care workers are at highest risk during an outbreak.
- Monkeypox is an emerging disease which has become the most prevalent orthopoxvirus since the global eradication of smallpox that was declared by the World Health Assembly in 1980. This is partly because smallpox vaccination which was cross-protective for other orthopoxviruses was discontinued at the time which means younger people no longer have vaccine-induced immunity.
- Human monkeypox was first identified in humans in 1970 in the Democratic Republic of Congo which remains the country that routinely reports the highest number of cases (>1,000) annually since 2005. Other countries that have reported human cases since 1970 include Sierra Leone, Liberia, Cote d'Ivoire, Nigeria, Cameroon, Gabon, Republic of Congo, Central African Republic and Sudan (in an area that is now South Sudan). Since late 2016 there have been increasing reports of monkeypox cases from countries that have not seen any for the past 40 years.
- Clinical recognition, particularly differential diagnosis with other rash and fever illnesses such as chickenpox, laboratory-based diagnosis and prevention remain critical challenges in endemic areas. Two distinct clades or subtypes have been identified. It is believed that infection with a West African strain of monkeypox virus causes a less severe infection, fewer deaths, and lower rates of human-to-human transmission as compared to outbreaks involving Central African strains.
- The incubation period of monkeypox is 6-16 days (range 5–21). The infection can be divided into two periods: (1) **invasion period** (0-5 days) characterized by fever, intense headache, lymphadenopathy (swelling of the lymph node), back pain, myalgia (muscle ache) and an intense asthenia (lack of energy); and (2) **skin eruption period** (1-3 days after appearance of fever) where the various stages of the rash appears, often beginning on the face and then spreading elsewhere on the body.
- The most distinguishing symptom of monkeypox is lymphadenopathy. The face (in 95% of cases), and palms of the hands and soles of the feet (75%) are most affected by the rash. Evolution of the rash from maculopapules (lesions with a flat bases) to vesicles (small fluid-filled blisters), pustules, followed by crusts occurs in approximately 10 days. Three weeks might be necessary before the complete disappearance of the crusts.
- Varicella (chickenpox) is often confused with monkeypox but can be distinguished from monkeypox and smallpox by its much more superficial lesions, their presence more on the trunk than on the face and extremities, and by the development of successive crops of lesions in the same area. Fever and rash occur simultaneously in chickenpox and develop more rapidly; with death being a rare complication.

Surveillance goal

- To detect and immediately respond to any suspected case of monkeypox.

Standard case definition

Suspected case:
An acute illness with fever > 38.3 C (101 F), intense headache, lymphadenopathy, back pain, myalgia, and intense asthenia followed one to three days later by a progressively developing rash often beginning on the face (most dense) and then spreading elsewhere on the body, including soles of feet and palms of hand.

Probable case:
A case that meets the clinical case definition, is not laboratory confirmed, but has an epidemiological link to a confirmed or probable case,.

Confirmed case:
A clinically compatible case that is laboratory confirmed.

Differential diagnosis:
Alternative causes of clinical symptoms that must be considered include other rash illnesses, such as, smallpox, chickenpox, measles, bacterial skin infections, scabies, syphilis, and medication-associated allergies.

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the appropriate levels.
- Ensure patient is isolated and health personnel attending have been vaccinated with smallpox vaccine.
- Implement airborne infection control precautions.
- Treat and manage the patient with supportive care and symptom-specific management.
- Collect and transfer specimen (prefer swab of rash) under strict safety conditions to confirm the case.
- Implement risk communication, community engagement, contact tracing and contact management.
- Conduct active surveillance to identify additional cases.
- Notify WHO.

Respond to action threshold

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.

Analyse and interpret data

Time: Graph cases and deaths daily/weekly/monthly. Construct an epidemic curve.

Place: Map location of case households.

Person: Immediate case-based reporting of cases and deaths. During the outbreak, count and report cases (including suspected and confirmed) and deaths. Analyse age and sex distribution. Assess risk factors (contact with wild animals or another active confirmed case) immediately.

Laboratory confirmation

Diagnostic test	Isolation of monkeypox virus from a clinical specimen (rash lesions) Or Polymerase chain reaction (PCR) assay identification of monkeypox DNA in a clinical specimen Note: Level C or D laboratories only.
Specimen	Optimal specimens: vesicular swabs of lesion exudate or crusts that can be in the following forms: Biopsy specimens* Scabs* Vesicular fluid swab* Lesion skin (roof)* Pustule material* Blood/serum samples – mostly for serology because viremia is short-lived. Requires detailed case and illness dates and information for appropriate interpretation **Note:** *blood samples from person where severe, dense rash may be difficult to draw as the skin may slough off. A central line may be needed for access in cases where a peripheral blood draw is difficult.* * preferred specimens for diagnosis of acute illness during rash phase

When to collect	A suspected case of monkeypox is a public health and medical emergency. Collect samples from every suspected case at earliest available times to achieve specimen types recommended.
How to prepare, store, and transport	Typical practices associated with collection of patient specimens are appropriate for collection of orthopoxvirus lesions as well. These include wearing personal protective equipment, including gloves and sanitizing the site prior to collection. If alcohol is used to prepare the lesion for collection it is important to allow the lesion to dry before it is collected. **Biopsy specimens:** Aseptically place two to four portions of tissue into a dry, sterile, leakproof, 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 dry, sterile, leakproof, freezable container. No viral transport media. Storage - 20 °C to - 70 °C. Transport ~6h at 4 °C. **Vesicular fluid:** Collect fluid from separate lesions onto separate sterile swabs. Be sure to include cellular material from the base of each respective vesicule. Storage -20 °C to - 70 °C. Transport ~6h at 4 °C. No viral transport media. **Blood** Draw 10 cc of blood into a plastic marble-topped tube, or a plastic yellow-topped serum separator tube. **Note:** *approval must be obtained prior to the shipment of potential monkeypox patient clinical specimens to a reference laboratory.*
Results	Diagnostic services for monkeypox are not routinely available at present. Advance arrangements are usually required for monkeypox laboratory diagnostic services. Contact the appropriate national authority or WHO.
Reference	
WHO Fact Sheet on Monkeypox: http://www.who.int/mediacentre/factsheets/fs161/en/	

11.30 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 (unsafe injections, unhygienic cutting of the umbilical cord) or breaks in the skin.
- It is primarily an infection of newborns but other age groups can also be infected. Neonatal tetanus has decreased dramatically in countries with improved maternal tetanus immunization rates. Maternal and neonatal tetanus is targeted for elimination in the WHO African Region, aiming to achieve neonatal tetanus incidence rates of less than 1 case per 1000 live births in a year in every LGA. 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 non-immunised and partially immunised 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 spasms (jerking of the muscles) or both.

OR

- Any neonatal death between 3 and 28 days of age in which the cause of death is unknown

Confirmed case:

- No laboratory confirmation recommended (the basis for case classification is usually clinical)

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:

- Immunize the mother and other pregnant women in the same locality as the case with at least 2 doses of tetanus toxoid.
- Conduct a supplemental immunization activity for women of childbearing age in the locality.
- Improve routine vaccine coverage through EPI and maternal immunization program activities.
- Educate birth attendants and women of childbearing age on the need for clean cord cutting and care. Increase the number of trained birth attendants.

Analyse and interpret data

Time: Summarize cases and deaths monthly using graphs

Place: Plot location of case households and location of birth attendants.

Person: Count monthly cases and deaths. Analyse each case of NNT by LGA, maternal characteristics (age, parity), place of delivery, cord care practices.

Laboratory confirmation

Laboratory confirmation is not required.

Reference

WHO–recommended standards for surveillance of selected vaccine-preventable diseases. WHO/V&B/03.01 http://apps.who.int/iris/bitstream/10665/68334/1/WHO_V-B_03.01_eng.pdf?ua=1

Global and regional elimination targets: who.int/immunization/global_vaccine_action_plan_gvap_2017

11.31 New HIV/AIDS Cases

Background

- Human Immunodeficiency Virus(HIV) infection: is an infection of human lymphocytes (types of white blood cells) and other organs caused by a retrovirus, HIV. Sexual intercourse, needle injections, transfusions, trans-placental or trans-vaginal routes, breast milk or other direct contact with infected human body fluids transmit 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 suppress 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.
- **An estimated 1.75 million Nigerians 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 persons who have unprotected sex with an infected partner, commercial sex workers and **men who have sex with men** with or without other sexually transmitted infections (STIs). Some STIs may increase HIV transmission. Others at risk include **people who inject drug (PWID),** recipients of unscreened blood products and neonates born to HIV-infected mothers.
- Tuberculosis, visceral leishmaniasis, trypanosomiasis, and other subacute or chronic bacterial, parasitic, and viral infections may cause similar syndromes.

Surveillance goal

- Monitor the impact of HIV/AIDS interventions in trends of incidence and prevalence of HIV infections, AIDS and STIs through sentinel sites, surveys and special studies (according to guidelines for second generation surveillance of HIV/AIDS).
- Estimate the burden of HIV/AIDS in the district using available information from HIV sentinel populations so that each new AIDS case is counted.
- Monitor local STI epidemiology as possible cofactor for HIV transmission.
- Monitor local opportunistic infection epidemiology, including TB
- Improve percentage of suspected HIV/AIDS cases confirmed via serology.
- Improve HIV/AIDS screening.

Standard case definition

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 and men who have sex with men.
- Provide HIV counselling and testing services at health facility and community levels.
- Promote antenatal attendance and HIV testing for all pregnant women. Provide ARVs to HIV positive pregnant women.
- Promote condom use, especially among high-risk individuals.
- Promote harm reduction including safe injection practices among people who inject drugs.
- 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.
- Provide treatment for individual cases with antiretroviral therapy to persons living with HIV.

Analyse and interpret data

Time: Count new AIDS cases and report monthly. Analyse by number of cases confirmed with serology. At the end of the year, calculate the total number of cases and include trends for HIV sero-surveillance, STI surveillance and results of any special studies (socio-behavioural studies, drug sensitivity to antimicrobial agents, and so on).

Laboratory confirmation

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 4 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 Organisation. 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

11.32 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 diarrhoea
  - 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.

Post Noma defect:
Any person with facial deformities involving the mouth, nose or any part of the face that is not congenital or trauma related but associated with past history of gingival or nasal infection.

Recommended public health action

When a suspected case is detected:

- Treat the case with nationally recommended antibiotic and refer immediately to Noma referral centres
- Conduct health promotion activities in the community for:
  - Oral hygiene campaign
  - 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.

Analyse and interpret data

Time: Monitor number of cases detected in time for treatment and use of standardized treatment. Monitor cases over time to estimate burden of disease and identify trends.

Place: Plot the location of case households and Analyse the distribution.

Person: Analyse 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 Organisation 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.

11.33 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.

Analyse and interpret data	
Time:	Graph cases quarterly.
Place:	Plot distribution of patients' household and workplaces
Person:	Count quarterly cases and Analyse age distribution.
Laboratory confirmation	
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	

11.34 Perinatal (Stillbirths and Neonatal) Deaths

Background

The Global Strategy for Women's, and Children's and Adolescents' Health - 'Global Strategy 2.0' with its three objectives of Survive, Thrive and Transform sets targets for the coming 15 years which Member States have agreed and committed to achieve. These targets include reducing neonatal mortality to less than 12 deaths per 1,000 births and stillbirths to less than 12 per 1,000 total births, in line with the multi-stakeholders' action plan. "Every Newborn: an action plan to end preventable deaths" (ENAP), which encompasses two goals: ending preventable newborn deaths and stillbirths.

Globally there are 2.7 million annual neonatal deaths, of these 1 million take place in the African Region. In Nigeria the under-5 mortality rate has decreased since 2008, from 157 deaths per 1,000 live births to 132 deaths per 1,000 live births. Similarly, there has been a slight reduction in infant mortality, from 75 to 67 deaths per 1,000 live births. However, there has been no noticeable change in the neonatal mortality rate over the same period instead there has been a slight increase from 2013 value of 37 per 1000 live births to 39 per 1000 live births (NDHS, 2018).

Three main causes of neonatal deaths make up about 80% of the deaths: birth asphyxia, prematurity and neonatal infections. Equally, there are about 2.6 million annual stillbirths globally, of which 98 percent occur in developing countries. About half of all stillbirths occur in the intrapartum period, representing the greatest time of risk. Causes of stillbirths may be a consequence of maternal conditions and diseases like pre-eclampia, obesity, diabetes, malaria, syphilis and HIV. There are however no available global estimates on causes of stillbirths.

The reduction of neonatal mortality reached 38% in the African Region during the MDG era. However, the reduction has been much slower than that of the under-5 mortalities of 54%. Achieving the set SDG target for the reduction of both stillbirths and neonatal deaths will require up to a seven-fold reduction of the current neonatal and stillbirth mortality rates in the African Region. This will require addressing current challenges for the efficient delivery of high quality services for mothers and newborns, but also efforts of strengthening the health information systems to understand the real number of deaths and the causes of deaths.

One of the biggest challenge in addressing both stillbirths and neonatal deaths is lack of information on the correct numbers and causes of deaths. Yet majority of the stillbirths and neonatal deaths can be prevented with clearly targeted quality interventions by appropriately skilled health workers. Addressing these gaps calls for investing birth and death registration through surveillance and response, linking with perinatal review and taking action.

Surveillance goal

- The primary goal is to eliminate preventable stillbirths and neonatal deaths by:
- counting every stillbirths and neonatal death through an active identification and reporting at community and facility level to permit an assessment of the true magnitude of stillbirths and neonatal mortality and the impact of actions to reduce them.
- Identifying underlying causes, contributing factors and high risk areas for stillbirths and neonatal deaths to effectively guide immediate as well as longer term actions and to inform program decisions to reduce these deaths.

Standard case definitions

- Perinatal death includes the death of a baby of at least 28 weeks of gestation and/or 1,000 g in weight and early neonatal death (the first seven days after birth)
- A stillbirth is defined as any death of a baby before birth and with no signs of life at birth of at least 1,000g birthweight and/or at least 28 weeks' gestation and 35 cm long.
- Early neonatal death is defined as any death of a live newborn occurring before the first 7 complete days of life. Day 1 is clinically considered the first day of life.
- Late neonatal death is defined as any death of live newborn occurring between 8 through 28 days after birth.

Respond to alert threshold

After determining that a perinatal death has occurred, the initial notification should be done immediately (within 24 hours), by the fastest means possible

The health facility should contact the LGA authority and provide information about the IDSR Case Alert form. Moreover, the health facility or the LGA perinatal death review committee is required to review the case within seven (7) days

PDR should be anonymous.

It should be linked to the maternal condition where applicable

The reports should not be used for disciplinary action or litigation

Recommended public health action

- In many low-income countries, it is not possible to review all perinatal deaths given the large numbers of deaths and the limited capacity in human resources and time. However, it is important to accurately capture and classify the causes of those deaths
- Selected perinatal death for review should be investigated to ascertain the cause.
- Surveillance for perinatal deaths should be conducted not just in the labour wards, but in the community, and all service areas where they occur.
- Response to any perinatal death is based on recommendations from the perinatal death review.
- Findings from review of the selected perinatal death should lead to actions to prevent similar deaths by identifying gaps that should be addressed at policy level and in both health facilities and communities.
- Monthly, quarterly or semi-annual analysis of aggregated data at larger health facilities and at LGA level can lead to a more comprehensive approach to address a particular problem across multiple facilities or communities or a problem in particular geographical areas where they are occurring in greater numbers. These should be conducted alongside those for maternal deaths by the MPDSR committee.

Analyse and interpret data
Measures of magnitude Number of stillbirths (SBR) Number of early neonatal deaths (NMR) Causes of stillbirths Causes of early neonatal deaths % of stillbirths and neonatal deaths due to avoidable factors Descriptive analysis by person, place and time: gestational age at time of death, socio economic status of family, education Time and date of death, weekday or weekend. Graph cases to construct a curve throughout the year in order to identify trends. where family lived or where women died. Analyse the distribution of the cases. Place of birth – facility or community
Laboratory confirmation
Routine laboratory confirmation for surveillance is not required.
Review committee
This should be the same committee as that for maternal deaths and can be renamed maternal and perinatal deaths surveillance and response (MPDSR) committee
Reference
• WHO Every Newborn Action Plan http://www.EveryNewborn.org; • WHO Application of ICD-10 to deaths during the perinatal period: ICD- PM; 2016; http://www.who.int/maternal_child_adolescent/en • ICD 10 PM: http://apps.who.int/iris/bitstream/handle/10665/249515/9789241549752-eng.pdf?sequence=1

11.35 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. If not treatment, bubonic plague could lead to pneumonic or septicemic plague
- Interhuman transmission only occurs with the pneumonic form. But a bubonic form can evolve to a pneumonic form
- 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 any case of plague promptly as, included in its bubonic form, a single can be at the origin of an outbreak

Standard case definition

Suspected case:

- compatible clinical presentation; (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).

  and

- consistent epidemiological features, such as exposure to infected animals or humans and/or evidence of flea bites and/or residence in or travel to a known endemic focus within the previou 10 days.

Confirmed case:
Any person with Suspected case confirmed by isolation of *Yersinia pestis* from blood or aspiration of buboes, or specific seroconversion or rapid diagnostic test detecting the Ag F1 in endemic areas

Respond to alert threshold

If a single case is suspected:

- Report case-based information to the next level.
- Isolate the patient if suspicion of pneumonic plague with precautions against airborne spread (the patient and the staff managing the patient must wear masks)
- 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 if the single case is a pneumonic plague.

Respond to action threshold	
If the suspected case is confirmed: ▪ Isolate patients with pneumonic plague with precautions against airborne spread (the patient and the staff managing the patient must wear masks) until at least after 48 hours of appropriate antibiotic therapy. Respect of the IPC standards ▪ Mobilize community to enable rapid case detection and treatment, 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).	
Analyse 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. Analyse 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 blood, or sputum. Specific seroconversion to *Y. pestis* F1 antigen from serum. Rapid diagnostic test detecting Ag F1
Specimen	Aspirate of buboes, blood, sputum, or autopsy materials for culture Blood for serological tests
When to collect the specimen	Collect specimen from all suspected plague cases, if possible before the administration of antibiotics. However, the treatment must not be delayed. Serum should be drawn within 5 days of onset then again after 2-3 weeks.
How to prepare, store, and transport the specimen	▪ Specimens should be collected using aseptic techniques. Materials for culture should be sent to the laboratory in Cary Blair transport media. Unpreserved specimens should reach the laboratory the same day. ▪ 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	Clinical specimens 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 5 working days from reception in the laboratory. Rapid diagnostic test gives a result in 15 minutes Antibiotic treatment should be initiated as soon as possible. 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	

11.36 Poliomyelitis (Acute Flaccid Paralysis)

Background

- Poliovirus (genus Enterovirus) serotypes 1, 2, and 3 are transmitted from person-to-person via faeco-oral route.
- 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 in a single limb.
- 1 in 200 infection leads to irreversible paralysis. Among those paralysed, 5-10% die, when their breathing muscles become immobilised
- Polio infection occurs almost exclusively among children under 5 years of age. Infection may occur with any of 3 serotypes of Poliovirus. Immunity is serotype-specific and lifelong.
- Paralytic polio, though not fatal in most cases, 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.
- As long as a single child remains infected, children in all countries are at risk of contracting polio. Failure to eradicate Polio from these last remaining strongholds could result in as many as 200,000 new cases every year, within 10 years all over the world.
- 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 stool specimens, 24 -48 hours apart within 14 days of the onset of paralysis.
- For any True AFP case, stool samples should be collected up to 60 days of onset of paralysis.
- Surveillance for AFP is used to capture all true cases of paralytic poliomyelitis. Target for surveillance performance to provide certification of polio eradication is 1 case of AFP per year per 100 000 population aged less than 15 years.

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 Vaccine Associated Paralytic Polio (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 what actions to take. They may include the following:
- Specify reasons for non-vaccination of each unvaccinated case and address the identified deficiencies.
- Immediately conduct "mop-up" vaccination campaign around the vicinity of the case.
- Conduct surveys to identify areas of low OPV coverage during routine Expanded Programme on Immunisation (EPI) activities, and improve routine vaccine coverage of OPV and other EPI antigens.
- Lead house-to-house vaccination in supplemental vaccination campaigns during National Immunization Days (NIDs) or Sub-National Immunization Days (SNIDs). Focus supplemental vaccination activities in areas of low routine immunisation coverage.

Analyse and interpret data

Time: Graph weekly cases by date of onset. Evaluate the percentage of suspected cases reported within 48 hours and the percentage with adequate laboratory specimen collection.

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 cases. Analyse age distribution and number of polio vaccine doses received. 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 stool sample from every suspected AFP case. Collect the first specimen when the case is investigated. Collect a second specimen from 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 21days 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 Organisation.
- 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

11.37 Human Rabies

Background

- Rabies is a zoonotic disease (a disease that is transmitted to humans from animals) that is caused by a virus.
  Rabies infects domestic and wild animals, and is spread to people through close contact with infected saliva (via bites or scratches).
- The rabies virus infects the central nervous system, causing disease in the brain and, eventually, death. Early symptoms in people include: fever, headache, and general weakness or discomfort. As the disease progresses, symptoms include; insomnia,
  anxiety,
  confusion, slight or partial paralysis, excitation, hallucinations, increase in saliva, difficulty swallowing, and fear of water.
- In unvaccinated humans, rabies is almost always fatal if post-exposure prophylaxis is not administered before
  the onset of severe symptoms. Death usually occurs within days of the onset of neurological symptoms.
- Dogs are the main carrier of rabies in Africa and are responsible for most (approximately 97%) of the human
  rabies deaths worldwide.
- WHO estimates approximately 55,000 human deaths worldwide due to rabies each year; in Africa the annual death toll is 24,000.
- People most at risk of rabies live in rural areas, and children are at highest risk of dog rabies. About 30% to
  60% of the victims of dog bites (the primary mode of virus transmission) are children less than 15 years of age. Children often play with animals and are less likely to report bites or scratches.
- Control of rabies in dog populations and access to human rabies post exposure prophylaxis can substantially reduce the burden of rabies in human populations
- Rapid and accurate laboratory diagnosis of rabies in humans and other animals is essential for timely
  administration of post-exposure prophylaxis. Within a few hours, a diagnostic laboratory can determine whether or not an animal is rabid and inform the responsible medical personnel.

Surveillance Goal

- Detect and respond promptly and appropriately to cases and outbreaks of rabies.
- Identify high-risk areas
- Estimation of disease burden
- Immediate reporting of cases and routine monthly summary reports

Standard Case Definition

Suspected

A person with one or more of the following: headache, neck pain, nausea, fever, fear of water, anxiety, agitation, abnormal tingling sensations or pain at the wound site, when contact with a rabid animal is suspected.

Confirmed

A suspected case that is laboratory confirmed

Recommended Public Health Action

For a single case:

- Post exposure prophylaxis to prevent rabies
- Isolate patient if rabies develops to prevent infection of others
- Immunize contacts if patient develops rabies
- Vaccinate local dogs and cats to prevent outbreaks

General preventive measures :

- Promote public awareness of rabies
- Target immunization campaign for domestic or wild animals in high-risk areas
- Maintain active surveillance of rabies in animals

Analyse and interpret data

Time: Plot cases monthly.

Place: Plot the location of case households and animal exposures.

Person: Analyse distribution of cases by age, exposing animal, and circumstances of infection. Assess risk factors to improve control of cases

Laboratory confirmation

Diagnostic test	Detection of rabies viral antigens by direct fluorescent antibody (FA) in clinical specimens, preferably brain tissue (collected post mortem) ▪ Detection by FA on skin or corneal smear (collected ante mortem) ▪ FA positive after inoculation or brain tissue, saliva or CSF in cell culture, in mice or in suckling mice ▪ Detectable rabies-neutralizing antibody titre in the CSF of an unvaccinated person ▪ Identification of viral antigens by PCR on fixed tissue collected post modern or in a clinical specimen (brain tissue or skin, cornea or saliva) ▪ Isolation of rabies virus from clinical specimens and confirmation of rabies viral antigens by direct fluorescent antibody testing.
Specimen	▪ Brain tissue (collected post mortem) ▪ Skin biopsy (usually from the neck) ▪ Corneal ▪ Saliva ▪ CSF ▪ Head of suspected rabid animal (dogs)

When to collect the specimen	When a person is bitten by a pet that appears sick or by a wild animal, the biggest concern is rabies. No test can determine whether the rabies virus has been transmitted to the person immediately after the bite. So, the animal is evaluated to determine whether the person requires treatment. A wild animal that has bitten a person is killed if possible, so that its brain can be examined. If a person who has been bitten by an animal becomes increasingly confused and agitated or paralyzed, the diagnosis is probably rabies. At this point, tests can detect the rabies virus. Post mortem: within 4-6hrs after death of patient, as soon as the suspected animal dies or is killed
How to prepare, store, and transport the specimen	Safety precautions in handling rabies virus should be taken to avoid infection. Remove the head of the suspected animal, wrap head completely such that no blood is oozing out. Where possible, request a veterinarian to assist in the collection and preservation of the specimen. Sample should be sent to Reference 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/CSF/ISR/99.2

Laboratory techniques in rabies, Fourth Edition, WHO, edited by F-X. Meslin et al World Health Organisation Rabies Fact Sheet. http://www.who.int/mediacentre/factsheets/fs099/en/

Council of State and Position Statement. Territorial Epidemiologists (CSTE). National Surveillance for Human Rabies. CSTE 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

11.38 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 2)

Standard case definition

Suspected case:

Early disease :

- Acute febrile illness (axillary temperature >37.5 °C or oral temperature of >38.0°C) of more than 48 hours duration that does not respond to antibiotic or antimalarial therapy, and is associated with:
- Direct contact with sick or dead animal or its products **AND / OR**:
- Recent travel (during last week) to, or living in an area where, after heavy rains, livestock die or abort, and where RVF virus activity is suspected/confirmed **AND / OR:**
- Abrupt onset of any 1 or more of the following: exhaustion, backache, muscle pains, headache (often severe), discomfort when exposed to light, and nausea/vomiting **AND / OR**:
- Nausea/vomiting, diarrhoea OR abdominal pain with 1 or more of the following: - Severe pallor (or Hb < 8 gm/dL)
  - Low platelets (thrombocytopenia) as evidence by presence of small skin and mucous membrane haemorrhages (petechiae) (or platelet count < 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.

Respond to action threshold

If a single case is confirmed:

- Mobilize the community for early detection and care.
- Initiate line list/register for cases
- 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.

Analyse 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. Analyse 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
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)	

11.39 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 (>38°C) 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.
- 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 potential4 (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.

Analyse 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.

11.40 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.

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.

Analyse and interpret data

Time:	Graph cases and deaths daily/weekly/monthly. Construct an epidemic curve during the outbreak.
Place:	Plot locations of case households and work sites using precise mapping.
Person:	Immediate case-based reporting of cases and deaths. During the outbreak, count and report cases and deaths. Analyse 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 titled slightly backward. Instil 1.5 ml non-bacteriostatic sterile saline (Ph 7.0) into one nostril. Flush a plastic catheter or tubing (e.g. mucus trap tubing) with 2-3 ml of saline. Insert the tubing into the nostril parallel to the palate. Aspirate nasopharyngeal secretions. Repeat for the other nostril. Collect aspirates in sterile vial or mucus trap. Remove tubings and discard in plastic bag. 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.

11.41 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 districts.

Respond to alert threshold

If you observe that the number of cases or deaths is increasing over a period of time:

- Report the problem to the next level.
- Investigate the cause for the increase and identify the problem.
- Make sure that cases are managed according to IMCI guidelines.
- Treat cases appropriately with recommended antimicrobial drugs

Respond to action threshold

If the number of case or deaths increases to two times the number usually seen during a similar period in the past:

- Assess health worker practices of IMCI guidelines for assessing, classifying and treating children with pneumonia and severe pneumonia.
- Identify high risk populations through analysis of person, place and time.
- Conduct community education about when to seek care for pneumonia.

Analyse and interpret data

Time:	Conduct month-to-month analysis for unexpected or unusual increases. Graph cases and deaths by month. Construct epidemic curve for outbreak cases. Plot month-to-month data and compare to previous periods.
Place:	Plot location of case households.
Person:	Count monthly pneumonia and severe pneumonia cases. Count pneumonia deaths. Analyse age distribution.

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

- Integrated Management of Childhood Illnesses. World Health Organisation. WHO/CDR/95.14.1

11.42 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) s*yphilis (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.

Analyse and interpret data

Time: Graph cases each quarter.

Place: No recommendation for analysis of place.

Person: Count quarterly cases and Analyse age distribution.

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

- Guidelines for Sexually Transmitted Infections Surveillance. Geneva. UNAIDS and World Health Organisation. WHO/CDS/CSR/EDC/99.3. UNAIDS/99.33E

11.43 Smallpox (Variola)

NOTE : Smallpox was eradicated worldwide in 1980 and there has been no disease in humans since 1977. Information in this section is provided to educate public health professionals to enable detection of re-emergence and to differentiate smallpox from similar diseases.

Background

- Smallpox is an acute contagious disease caused by variola virus, a member of the orthopoxvirus family. Other members of the genus that can cause disease in humans include cowpox, camelpox, and monkeypox. Monkeypox virus has caused the most recent human poxvirus infections.
- Smallpox killed up to 30% of those infected and left survivors scarred and sometimes blind. In 1967, when WHO launched an intensified programme to eradicate smallpox, annually there were 10-15 million cases and 2 million deaths globally.
- **The global eradication of smallpox was certified by a commission of eminent scientists in December 1979 and subsequently endorsed by the World Health Assembly in 1980.**
- The incubation period of smallpox is 12–14 days (range 7–17) during which there is no evidence of viral shedding i.e. the person is not infectious. During this period, the person looks and feels healthy and cannot infect others.
- The disease presents as sudden onset of high fever and other symptoms such as malaise, headache, backache, nausea, vomiting. Two to three days later, the temperature falls and the patient feels somewhat better, at which time the characteristic rash appears, first on the face, hands and forearms and then after a few days progressing to the trunk. Lesions also develop in the mucous membranes of the nose and mouth, and ulcerate very soon after their formation, releasing large amounts of virus into the mouth and throat. The centrifugal distribution of lesions, more prominent on the face and extremities than on the trunk, is a distinctive diagnostic feature of smallpox and gives the trained eye cause to suspect the disease. Lesions progress from macules to papules to vesicles to pustules. All lesions in a given area progress together through these stages. From 8 to 14 days after the onset of symptoms, the pustules form scabs which leave depressed depigmented scars upon healing.
- Smallpox had two main forms: variola major and variola minor (the latter was less common).). The disease followed a milder course in variola minor, which had a case-fatality rate of less than 1 per cent. The fatality rate of variola major was around 30%. There are two rare forms of severe smallpox: haemorrhagic and malignant. In the former, invariably fatal, the rash was accompanied by haemorrhage into the mucous membranes and the skin. Malignant smallpox was characterized by lesions that did not develop to the pustular stage but remained soft and flat. It was almost invariably fatal.
- Varicella (chickenpox) is often confused with smallpox can be distinguished from smallpox by its much more superficial lesions, their presence more on the trunk than on the face and extremities, and by the development of successive crops of lesions in the same area. Fever and rash occur simultaneously in chickenpox and develop more rapidly; with death being a rare complication.
- Smallpox is transmitted from person to person by infected aerosols and air droplets spread in direct and fairly prolonged face-to-face contact with an infected person after fever has begun, especially if symptoms include coughing. The disease can also be transmitted by contaminated clothes and bedding, though the risk of infection from this source is much lower.

- The most infectious period is when face-to-face contact occurs with a patient after fever has begun and during the first week of rash, when the virus is released via the respiratory tract. The most at-risk settings are households and health care settings with active cases but spread in the community is low because sick people are bedridden.
- In the absence of immunity induced by vaccination, humans appear to be universally susceptible to infection with the smallpox virus. Since vaccination with smallpox vaccine was discontinued globally after the eradication of smallpox in 1980, most of the world's population under 40 years of age are not immune and the older age groups have waning immunity.
- WHO maintains smallpox vaccine emergency stockpiles to be deployed in the event of a smallpox re-emergence in order to contain the outbreak. First responders are prioritized to receive the vaccine. Vaccine administered up to 4 days after exposure to the virus, and before the rash appears, provides protective immunity and can prevent infection or ameliorate the severity of the disease.
- Immediate Notification of the occurrence of smallpox cases to WHO is formally required by IHR (2005). The risk of emergence of smallpox is extremely low as the remaining global live variola virus stocks are held in two high security laboratory facilities in Russia and the US and the disease has no animal reservoir.

Surveillance goal

To detect and immediately respond to a potential re-emergence or any suspected case of smallpox.

Standard case definition

Suspected case: An acute illness with sudden onset of high fever > 38.3 C (101 F) followed by a characteristic rash (macules, vesicles, pustules, cursts) with centrifugal distribution in the same stage of development without other apparent cause.

Probable case: A case that meets the clinical case definition, is not laboratory confirmed, but has an epidemiological link to a confirmed or probable case.

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.
- Ensure patient is isolated and personnel attending have been vaccinated with smallpox vaccine.
- Implement airborne infection control precautions.
- Treat and manage the patient with supportive care.
- Collect and transfer specimen (prefer swab of rash) under strict safety conditionsconditions 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.

Analyse and interpret data

Time:	Graph cases and deaths daily/weekly/monthly. Construct an epidemic curve.
Place:	Map location of case households.
Person:	Immediate case-based reporting of cases and deaths. During the outbreak, count and report cases and deaths. Analyse age and sex distribution. Assess risk factors (contact with another active confirmed case) immediately.

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 swab* 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.

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. **Blood** Draw 10 cc of blood into a plastic marble-topped tube, or a plastic yellow-topped serum separator tube. Note: approval must be obtained prior to the shipment of potential smallpox patient clinical specimens to a Reference laboratory.
Results	Diagnostic services for smallpox are not routinely available. Advance arrangements are usually required for smallpox diagnostic services. Contact the appropriate National authority or WHO.
Reference	
• WHO Fact Sheet, Smallpox. http://www.who.int/mediacentre/factsheets/smallpox	

11.44 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).

Recommended public health action	
The World Health Organisation 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	
Analyse and interpret data	
Time: Monitor epidemiologic trends over time. **Place:** Plot the location of case households and Analyse the distribution. **Person:** Analyse the distribution of cases by age and other demographic factors.	
Lab confirmation	
Routine laboratory confirmation for surveillance is not required.	
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
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.

Reference

- WHO Trachoma Page
  http://www.who.int/topics/trachoma/en/
- World Health Organisation. Trachoma control: A guide for program managers. Geneva: World Health Organisation, 2006.
  http://www.who.int/blindness/publications/tcm%20who_pbd_get_06_1.pdf
- World Health Organisation. Achieving Community Support for Trachoma Control. Geneva: World Health Organisation, 1993.
  http://www.who.int/blindness/achieving_en.pdf
- World Health Organisation. Primary Health Care Level Management of trachoma. Geneva: World Health Organisation, 1993.
  http://www.who.int/blindness/publications/trachoma_english.pdf
- World Health Organisation. Trachoma epidemiologic survey protocol. Geneva: World Health Organisation, 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

11.45 Trypanosomiasis

Background

- Trypanosomiasis is an infection of blood, lymphatics and central nervous system. In Africa it is caused by the protozoan Trypanosoma burcei rhodesiense and T. b. gambiense, which are transmitted by the bit of infected Glossina (tsetse) flies.
- Trypanosomiasis is endemic in over 30 African countries in West, Central and East Africa. It is highly epidemic in the Democratic Republic of Congo, Angola, and other areas of civil conflict, where 80% of some village populations may be infected. Cattle are the major reservoir of Trypanosoma brucei rhodesiense, and humans are the major reservoir for T. b. gambiense.
- Incubation period is usually days to weeks with T. b. rhodesiense, and months to years with T. b. gambiense infections. Without treatment, both forms are usually fatal.
- Trypanosomiasis control strategies include human and cattle population surveys to treat infected persons and diminish cattle reservoirs, and tsetse fly habitat control (for example, removal of bushes and tall grasses near villages, and use of residual insecticides).
- Tuberculosis, malaria, bacterial meningitis, HIV/AIDS, and other central nervous system or systemic infections can produce similar clinical findings.

Surveillance goal

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

Standard case definition

Suspected case:

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

Late stage: Cachexia, somnolence, and central nervous system signs.

Confirmed case:

A suspected case confirmed by card agglutination trypanosomal test (CATT) or by isolation of trypanosomes in blood lymph nodes or cerebrospinal fluid.

Respond to alert threshold

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.	
Analyse and interpret data	
Time:	Graph quarterly cases.
Place:	Plot the distribution of case households.
Person:	Count monthly cases, and Analyse 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 Organisation, 1998 (WHO Technical Report Series, No. 881). ▪ WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2	

11.46 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 microscope

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.	
Analyse and interpret data	
Time:	Graph cases and deaths monthly.
Place:	Plot distribution of case households and workplaces.
Person:	Count monthly cases and deaths. Analyse age and sex distribution quarterly.
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

11.47 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

- Initiate a line list/register for cases
- Identify areas/populations at high risk to identify source(s) and mode(s) of transmission in order to prevent and control the disease.
- Conduct health education programmes on hygiene with simple messages on safe water, safe food handling practices, hygiene and handwashing.
- Work with water authorites to support provision of clean water and proper sanitation to affected population(s). Chlorinate suspected water supplies. All drinking water should be chlorinated or boiled before use.
- More than 90% of patients can be managed at home with oral antibiotics, reliable care and close medical follow-up for complications or failure to respond to therapy. Patients with persistent vomiting, severe diarrhoea and abdominal distension may require hospitalization and parenteral antibiotic therapy.

Analyse and interpret data

Time: Graph cases and deaths weekly. Construct an epidemic curve during outbreaks.

Place: Plot location of case households with precise mapping.

Person: Report immediate case-based information for cases and deaths. Report summary totals monthly. During outbreak, count cases and deaths weekly. Analyse 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	BloodStool

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	

11.48 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

Analyse and interpret data

Time:	Construct an epidemic curve during the outbreak.
Place:	Plot location of case residence and worksite.
Person: report	Immediate case-based reporting of cases and deaths. During an outbreak, count and
	cases and deaths. Analyse 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 Organisation, 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
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11.49 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 is life time

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	
Laboratory confirmation	
Diagnostic test	▪ ELISA for the presence of yellow fever Specific IgM and IgG antibodies. ▪ Exclusion of Dengue, West Nile virus and other locally prevalent flavivirus will be necessary for the confirmation of yellow fever. ▪ PCR, YF specific seroneutralization, virus isolation or histopathology
Specimen	Serum in the acute and convalescent phases of the illness; In the event of death, postmortem liver specimen

When to collect the specimen	Within 14 days of onset of first symptoms Collect specimen from at least the first to 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: o Let clot retract for 30 to 60 minutes at room temperature. Centrifuge at 2000 rpm for 10-20 minutes and pour off serum into a clean glass tube. o If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clot retracts. Pour off serum the next morning. o If no centrifuge and no refrigerator, let blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle. Pour off serum into a clean tube. ▪ Store serum at 4°C. Transport serum samples using appropriate packaging to prevent breaking or leaks during transport. Avoid glass tubes for shipment and transport if possible. The specimen should arrive at the laboratory within 3 days of being collected. Avoid shaking of specimen before serum has been collected. To prevent bacterial overgrowth, ensure that the serum is poured into a clean glass test tube. The test tube does not need to be sterile – just clean. Transport the serum in an EPI hand vaccine carrier at 4°C-8°C to prevent bacterial overgrowth (up to 7 days). If not refrigerated, serum stored in a clean tube will be good for at least 3 days.
Results	Laboratory results should be received within 7 days of reception of the specimen in the laboratory.

Reference

- WHO–recommended standards for surveillance of selected vaccine-preventable diseases. WHO/V&B/03.01 http://apps.who.int/iris/bitstream/10665/68334/1/WHO_V-B_03.01_eng.pdf?ua=1
- Yellow Fever. 1998. WHO/EPI/Gen/98.11
- Recommendation of Expert Meeting on Yellow Fever Surveillance and Response in Africa. Brazzaville, Congo, from 13 to 15 October 2010

11.50 Zika

Background

- Zika virus is a flavivirus that is transmitted primarily through the bite of an infected mosquito, primarily Aedes aegypti, and also Aedes albopictus, the same mosquitoes that transmit dengue, chikungunya, and yellow fever.
- Zika virus can also be transmitted in-utero from mother to fetus, and through sexual contact, blood transfusion, and organ transplantation.
- Zika virus infections are usually asymptomatic. When symptoms occur, they tend to be mild and include mild fever, rash, conjunctivitis, and muscle and joint pain that last for 2 to 7 days. There is no specific treatment but symptoms can be treated with common fever medicines, rest and drinking fluids.
- Zika virus infection during pregnancy can result in preterm birth, fetal loss, stillbirth, and congenital malformations including microcephaly, limb contractures, eye abnormalities, brain calcifications, and other manifestations of Congenital Zika Syndrome.
- Zika virus is also associated with an increased risk of Guillain-Barré syndrome, requiring close medical management and possibly intensive care and mechanical ventilation.

History

- Zika virus was first identified in 1947 in a rhesus monkey the Zika forest of Uganda, and was first identified in humans in 1952 in Uganda and the United Republic of Tanzania. Over the following decades, Zika virus caused rare, sporadic cases of disease in Africa and Asia, generally causing mild and self-limited illness of fever, rash, malaise, and other mild symptoms.
- The first outbreaks were reported in Yap Island (Federated States of Micronesia) in 2007 and French Polynesia in 2013. The virus subsequently spread to other Pacific islands including New Caledonia, Cook Islands, Vanuatu and Easter Island (Chile), Fiji, Samoa, Solomon Islands, and Vanuatu. Zika virus was not known to cause severe disease until the 2013-2014 outbreak in French Polynesia, where increased incidence of Guillain-Barré Syndrome was first reported.
- The Zika virus outbreak in the Region of the Americas began in Brazil in 2015; in July 2015, Brazil reported an association between Zika virus infection and Guillain-Barré syndrome (GBS) and few months later, in October 2015, an association between Zika virus infection and microcephaly.
- Since 2015, outbreaks of Zika virus disease have now been recorded in Africa, the Americas, Asia and the Pacific; over 80 countries and territories have reported Zika transmission. Since 2017, Zika virus transmission in the Americas has waned, but transmission continues with intermittent areas of emergence and re-emergence.
- In the African Region, only rare, sporadic Zika virus infection had been reported until 2015. Since 2015, outbreaks of Zika virus have been reported in Cabo Verde, Guinea-Bissau, and Angola.
- There are two strains of Zika virus known as the African and Asian strains. The Asian strain was associated with the outbreaks in the Pacific and in the Americas. The Asian strain was also identified in the Cabo Verde outbreak and in a traveler returning from Angola. To date, microcephaly has only been identified following infection with the Asian strain. Little information is available on the spectrum of disease and pregnancy risk associated with the African strain.
- Aedes mosquitoes that transmit Zika, dengue, yellow fever, and chikungunya primarily bite during daylight hours. Aedes sp. breed in small collections of water such as in trash, used tyres, flower pots, and open water storage containers. Efforts to prevent transmission focus on elimination of these breeding sites around homes and near other areas of human-vector contact such as around schools and work sites. Other prevention strategies include use of personal protection measures such as use of protective clothing, insect repellant, and screens on windows and doors.

Surveillance goals

The goal of surveillance is to develop, strengthen and implement integrated surveillance systems at all levels for Zika virus disease, its complications, and other arboviral diseases and their vectors, in order to provide up-to-date and accurate epidemiological and entomological information, to guide response.

Existing surveillance systems should be enhanced for early detection and reporting of Zika virus and unusual clusters of neurological disorders or neonatal malformations.

Timely notification of any event compatible with Zika virus is important, and in particular any associated with neurological disorders and neonatal malformations through established channels, including IHR.

The establishment or strengthening of event-based or syndromic surveillance should be supported, potentially targeting specific groups for surveillance, such as pregnant women through antenatal and postnatal care, sentinel based surveillance systems for birth defects and Guillain-Barré syndrome, and existing lab-based disease specific surveillance systems (e.g. measles, polio) to facilitate detection of Zika virus infection and associated disorders.

Standard case definitions

Suspected Case:
A person presenting with rash and/or fever and at least one of the following signs or symptoms:

- arthralgia; or
- arthritis; or
- conjunctivitis (non-purulent/hyperaemic).

Probable case:

A suspected case with presence of IgM antibody against Zika virus and an epidemiological link (with no evidence of infection with other flaviviruses).

Confirmed case:

A person with laboratory confirmation of recent Zika virus infection:

- presence of Zika virus RNA or antigen in serum or other samples (e.g. saliva, urine, tissue, whole blood); or
- IgM antibody against Zika virus positive and PRNT90 for Zika virus with titre ≥20 and Zika virus PRNT90 titre ratio ≥ 4 compared to other flaviviruses; and exclusion of other flaviviruses.

These case definitions may change based on new knowledge.

Response to Zika virus disease

If Zika virus cases are suspected:

- Immediately report suspected cases to the next level using the case-based reporting form.
- Collect specimens for laboratory confirmation of cases [Emerging Dangerous Pathogen Laboratory Network (EDPLN)].
- Conduct active search for additional cases.
- Strengthen event-based surveillance to detect the emergence of clusters of cases presenting with rash and febrile syndrome of unknown aetiology.
- Conduct an investigation to determine risk factors for transmission.
- Manage and treat cases with supportive care.

If Zika virus cases are confirmed:

Coordination and leadership

- Develop a national contingency plan for the prevention and control of Zika virus transmission and disease.
- Reinforce the Incident Management System to strengthen their coordination [including emergency operations center (EOC)] to include the preparedness to respond to Zika, dengue, chikungunya and yellow fever.
- Actively engage other sectors (e.g., environment, agriculture, tourism) to respond to Zika virus through a multisectoral approach (One Health approach).

Surveillance, data management and laboratory

- Notify WHO through Ministry of Health using the IHR decision instrument.
- Enhance surveillance of Zika virus disease and of the conditions that may be associated with it, including microcephaly and Congenital Zika Syndrome and Guillain-Barré syndrome (GBS).
- Enhance surveillance at prenatal and postnatal clinics to monitor possible congenital infections and complications.
- Conduct active search for additional cases.
- Ensure the rapid and timely reporting and sharing of information of Zika virus disease using the IDSR/IHR tools.
- Ensure proper collection, transport, and storage of specimens for laboratory diagnostic testing.
- Conduct community-based assessments to determine the abundance of vector mosquitoes, identify the most productive larval habitats, promote and implement plans for appropriate vector control.
- Report any identified unusual increase in the incidence of congenital neurological malformations including microcephaly in neonates and adverse pregnancy outcomes not explained through alternate causes, to the relevant public health authorities using IDSR framework.

Vector control and personal protection

- Intensification of efforts to reduce mosquito populations including elimination of potential breeding sites (e.g., removal of trash and standing water sites around homes, covering home water storage containers, and use of larvicides) and adult mosquito control methods.
- Promotion of personal protection measures such as use of light-coloured protective clothing (long sleeves and pants), insect repellent, and physical barriers such as screens, closed doors and windows, and sleeping under mosquito nets including during the day when Aedes mosquitoes are most active.
- All operators and other persons involved in vector control, such as larvicide application and indoor residual spraying, should be given protective measures including personal protective equipment.

Social mobilization, community engagement and communication

- Develop risk communication messages to address population concerns, enhance community engagement, improve reporting, and ensure application of vector control and personal protective measures targeting reduction of contact with the vector.
- Provide women of childbearing age and particularly pregnant women with the necessary information and materials on family planning and to reducing risk of exposure.
- Provide clinical and psychosocial support services for affected children and families.

Transmission prevention and case management

- Engage community health workers to inform them of the disease and risks and to build capacity
- Reinforce preventative measures for pregnant women through targeted interventions (including primary antenatal, postnatal and neonatal health care settings).
- Pregnant women who feel they may have been exposed to Zika virus may wish to consult with their health-care providers for laboratory testing for Zika virus infection, ultrasound assessment, and close monitoring throughout pregnancy, labor, delivery, and the post-natal period.
- After delivery, all infants should have head circumference measured and be examined for evidence of congenital malformations, including microcephaly, eye abnormalities, limb contractures, and other anomalies associated with congenital Zika syndrome. http://apps.who.int/iris/bitstream/10665/204475/1/WHO_ZIKV_MOC_16.3_eng.pdf?ua=1
- Zika can be transmitted through blood and blood products. Precautions already in place for ensuring safe blood donations, transfusions, and prevention of bloodborne pathogens should be followed.
- Zika can be transmitted sexually. Men and women need to get counselling on safer sexual practices, and be offered condoms and full range of contraceptive methods.
- Ensure that pregnant women who have been exposed to Zika virus be counselled and followed for birth outcomes based on the best available information and national practice and policies.
- Refer most severe cases with complication to hospitalized cares.

Operational research

- Conduct studies including case-control studies to investigate disease outcomes of infants exposed in-utero to Zika virus infection.
- Promote research in the areas of vaccines, drugs, diagnostics, vector biology and appropriate mosquito control methods.
- Entomological surveillance of Aedes mosquitoes is used for operational research purposes to determine changes in geographical distribution, for monitoring and evaluating control programmes, for obtaining relative measurements of the vector population over time, and for facilitating appropriate and timely decisions regarding interventions. Sampling of Aedes mosquitoes, pupae and oviposition should be conducted.
- As part of entomological surveillance, insecticide resistance monitoring in field populations of Aedes should be conducted to identify and select the appropriate insecticides.

NB: Application of strategic intervention in different country contexts:

The described interventions will be packaged and applied in countries depending on the context. In countries where there is the spread of Zika virus as well as the associated complications, a full suite of strategies will be applied from enhanced surveillance, engaging communities, vector control and personal protective measures, care for people with complications and public health research to better understand risk and evaluate mitigation measures.

For countries are already experiencing widespread Zika transmission or presence of *Aedes* vectors, enhanced surveillance should be put in place, communities engaged, and vector control and personal protective measures enhanced.

For all other countries, risk communications for the public regarding trade and travel will be the main line of engagement. Table 1 below outlines the application of the strategies in the varying country context.

Country Context	Engage communities communicate risks	Monitor for Zika virus transmission and disease	Control transmission and prevent exposure	Manage complications associated with Zika virus	Investigate associated risks
Aedes + Zika virus + Associated complications	✓	✓	✓	✓	✓
Aedes + Zika virus	✓	✓	✓		
Aedes	✓	✓	✓		
Other	✓				

Table 1: Application of strategies to country context

Analysis and interpretation of data	
Time: Graph cases of Zika virus infection, Guillain-Barré syndrome, and deaths weekly, by date of onset of symptoms. Graph cases of microcephaly and congenital Zika syndrome by date of birth. Construct an epidemic curve during the outbreak. **Place:** Plot location of case households and worksites using precise mapping. **Person:** Report case-based information for cases including Zika virus associated complications, hospitalizations, and deaths. Analyse age and sex distributions and rates of associated complications. Assess risk factors to improve prevention of outbreaks and to better understand the rate of neurological complications among those infected with Zika virus. **NB: Entomological Analysis** In affected and high risk areas map infected and uninfected mosquito populations, breeding sites and case households	
I. Laboratory confirmation	
Diagnostic tests	Reverse transcriptase-polymerase chain reaction (RT-PCR) for viral RNA Serology for IgM detection Plaque reduction neutralization test (PRNT)
Specimens	RT-PCR: serum, whole blood, or urine collected in a dry tube within 7 days of onset of symptoms Serology (IgM): whole blood or serum collected in a dry tube >7 days after onset of symptoms. Whenever possible, a convalescent specimen should be collected at least 2-3 weeks after first specimen for IgG
How to prepare, store and transport specimen	Transport of specimens should comply with the WHO guidelines for the safe transport of infectious substances and diagnostic specimens. Keep refrigerated (2-8 °C) if specimen will tested within 48 hours of collection. If testing will be done >48 hours, separate and freeze serum at -20 °C and store for up to 7 days. If storage >7 days, serum specimens should be stored at -70 °C. All types of specimens may be kept frozen at -20oC for up to 7 days, or at -70oC if >7 days. Samples can be preserved for extended periods. Repeated freezing and thawing of specimens should be avoided. Temperature should be monitored and recorded regularly to diminish risk of temperature fluctuations. Aedes mosquitoes for testing should be frozen and transported dry using standardized protocols.

Results	Diagnostic services for Zika virus are not routinely available. Contact the appropriate National authority or WHO for the assigned reference laboratory within the EDPLN.

References

- Information note to the WHO representatives on prevention and response to Zika virus in the WHO African region, February 2016
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- The 2010 IDSR second edition; http://www.afro.who.int/en/clusters-a-programmes/dpc/integrated-disease-surveillance/features/2775-technical-guidelines-for-integrated-disease-surveillance-and-response-in-the-african-region.html
- Zika virus Fact sheet, Updated January 2016; http://www.who.int/mediacentre/factsheets/zika/en/
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11.51 Yaws and Endemic Syphilis or Bejel

Background

- Endemic trepanometoses in the WHO African Region include two Neglected Tropical Diseases caused by two different sub species of *Treponema pallidum (T.p.)*: yaws, due to *T. p. pertenue* and bejel caused by *T. p. pallidum*
- Yaws initially presents as a papilloma teemed with bacteria (primary yaws). The papilloma is a typical presentation of yaws and clinical diagnosis is straightforward. Without treatment, the papilloma will ulcerate. Papilloma and ulcers are very infectious and in the absence of treatment can quickly spread to other persons. Other clinical forms of yaws exist but they are not very infectious. Apart of papilloma and ulcers, other lesions of yaws and bejel range from macules, papules, nodules, plaques to secondary yaws that occurs weeks to months after the primary infection and typically presents with multiple raised yellow lesions or pain and swelling of long bones and fingers (dactylitis).
- Yaws spreads in inter-tropical areas, in humid and warm zones such as equatorial rain forests and their surroundings, while bejel is found in most dry and arid regions such as the Sahel trip
- Children from 2 to 14 years old are the most affected age-group, especially in school-age children where outbreaks of yaws or bejel could be observed
- Yaws treatment which was based on single injection of long lasting penicillin (benzathine benzyl penicillin) has improved greatly by the confirmation of the efficacy of a single dose of Azithromycin for curing yaws lesion in 2010. Further to this confirmation, the WHO has designed a yaws eradication strategy, titled "The Morges Strategy" from the name of a city near Geneva, where the Strategy was drafted in 2012. This eradication strategy consists mainly in mass administration of azithromycin (MAA) to at-risk communities and achieving at least 90% coverage of targeted populations
- The mode of transmission is through direct contact with skin lesions or items already contaminated by primary lesions (papilloma and ulcers)
- Confirmation of diagnosis is done by dual treponemal and non-treponemal rapid tests, a syphilis test which is not specific for yaws followed by a dual path platform (DPP) test which is specific for *T. p; pertenue.* These rapid tests can be performed in the fields and are able to detect recent and past infections

Surveillance goal

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

Standard case definition

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

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

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

Index case: first case of yaws which is detected in a community

Contact of a case: a person who has close, frequent contact with the infected person. A contact for the purpose of yaws eradication is the household, classmates or close playmates as identified by the contact

Respond to alert threshold

If a single case is suspected:

- Report the suspected case to the appropriate level of the health system (peripheral health facility or health district) for serological confirmation and exclusion of imported case.

If the suspected case is not confirmed:

- Maintain surveillance for three years during the post-elimination of transmission period

Respond to action threshold

If a single case is confirmed and importation excluded:

- The area is confirmed endemic and eradication strategy is implemented

If a single case is confirmed and is an imported case:

- Treat the case and his contacts as identified by the case and re-start post-elimination of transmission surveillance for again a three-year period

Analyse and interpret data

Time: Graph of cases by year of diagnosis, graph of cumulative number of cases.

Place: Plot cases by location of households and colour shade endemic districts.

Person: Count newly detected cases which were treated and number of contacts identified and treated. Estimate the number of persons in endemic communities or districts and calculate treatment coverage of Mass Azithromycin Administration (at least 90%.)

Laboratory Confirmation

Diagnostic test	▪ Positive rapid Syphilis test confirmed by positive dual path platform (DPP) test ▪ PCR ▪ Histo-pathology
Specimen	▪ Blood from finger stick for serological tests ▪ Swab samples from papilloma and ulcerated lesions for PCR ▪ Biopsy of lesions for histo-pathology
When to collect the specimen	Specimens should be collected from suspected patient with clinical symptoms (papilloma and ulcers mainly
How to prepare, store, and transport the specimen	During collection of specimen for PCR test, it is important to avoid cross contamination between the collection of samples Materials: Dry swabs and recipients. Types of specimens: swabs from papilloma and ulcers, stored at 4°C
Results	Positive Rapid Syphilis test and positive DPP test Positive PCR for Treponema pallidum pertenue for yaws or Treponema pallium pallidum for bejel Evidence of causative organisms in histo-pathological samples

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11.52 COVID-19

Background

- Coronaviruses are a large family of RNA viruses that infect birds and many mammals including humans. These viruses cause illnesses that range from common cold to more severe respiratory diseases and rarely gastroenteritis.
- Coronavirus disease (COVID-19) is caused by an emerging strain of coronavirus (SARS-Cov-2) that has not been previously identified in humans, belonging to the same family of viruses responsible for severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), for which zoonotic and person- to-person transmission have been confirmed
- Person-to-person transmission has been established between people who are in close contact with one another (within about 2 metres/6 feet), primarily via respiratory droplets. Droplet transmission occurs when respiratory droplets generated via coughing, sneezing or talking contact susceptible mucosal surfaces, such as the eyes, nose or mouth. Transmission may also occur indirectly via contact with contaminated fomites with hands and then mucosal surfaces. Respiratory droplets are large and are not able to remain suspended in the air thus they are usually dispersed over short distances. Airborne transmission has also been reported.
- Cases of COVID-19 may present as mild or severe cases.

Common features of Mild and Severe Cases of COVID-19 are:

Mild	Severe
Presence of: 1. Fever < 38degrees or (may be afebrile) 2. No difficulty in breathing 3. Presence or absence of cough 4. No underlying chronic diseases, e.g.: heart, lung, asthma and kidney diseases	Presence of: 1. Difficulty in breathing 2. Crackles in lungs 3. Reduced/decreased breath sounds 4. Dullness in percussion 5. Increased or decreased vocal resonance 6. Presence of co-morbid conditions such as diabetes, asthma, hypertension, etc.

Surveillance goal

- Early detection of cases and outbreaks, rapid investigation, and early laboratory confirmation of the cases.
- Investigation of all suspected cases with contact tracing.

Assess and monitor the spread and progress of Epidemic/Pandemics and the effectiveness of control measures.

Standard case definitions

Suspected case of COVID-19: A suspect case is defined as any person (including severely ill patients) presenting with fever, cough or difficulty in breathing AND who within 14 days before the onset of illness had any of the following exposures:

- History of travel to any country with confirmed and ongoing community transmission of SARS-CoV-2

  OR

- Close contact with a confirmed case of COVID-19

  OR

- Exposure to a healthcare facility where COVID-19 case(s) have been reported

Confirmed case
A person with laboratory confirmation of SARS-CoV-2 infection with or without signs and symptoms.

Probable case
A probable case is defined as a person who meets the criteria for a suspect case AND for whom testing for COVID-19 is inconclusive or for whom testing was positive on a pan-coronavirus assay

A contact case: someone who had contact (within 1metre) with a confirmed case during their symptomatic period, including one day before symptom onset

Note: *During an outbreak, case definitions may be changed to correspond to the local event.*

Community Case Definitions

Suspected Case

Anyone with Cough and/or fever (or history of fever in the last 2 weeks) with 1 or more of these symptoms.

- Shivering / Shaking (Chills)
- Body pain
- Headache
- Sore throat
- Recent loss of taste or smell
- Difficulty in breathing/shortness of breath
- Diarrhea/abdominal pain
- Runny nose/catarrh
- Fatigue (Tiredness)

Probable Case
A probable case of COVID-19 is any person that presented with any of the above symptoms in the last 2 weeks and died without a confirmatory COVID-19 test.

Note: for confirmed asymptomatic cases, the period of contact is measured as the 2 days before, through the 14 days after the date on which the sample was taken which led to confirmation.

Respond to alert threshold

If a single case is suspected:

- Document using the standard tool for case investigation to check that patient meets the casedefinition in section 1.2 (See Annex I)
- Put patient in a holding area and institute infection prevention measures (Refer to guideline on IPC)
- Alert the relevant authorities: Hospital management, infectious disease team or responsible physician, State Epidemiologist, NCDC on NCDC Toll-Free Number: 0800 9700 0010 SMS: 08099555577 and WhatsApp: 07087110839
- Using full PPE (gown, gloves, N95, and face shield), arrange for the collection of 1 nasal and 1 oropharyngeal swab. Both swabs should be placed into a single tube of virus transport
- Suspected cases should be treated separately in a single room,
  - All healthcare workers must ensure use of appropriate PPE before triage commences
  - NATIONAL INTERIM GUIDELINES FOR CLINICAL MANAGEMENT OF COVID-19
- medium (VTM). Sputum samples can be collected if a patient has a productive cough. For severely ill patients, endotracheal aspirate or bronchoalveolar lavage are recommended. Samples should be packaged according to national SOPs and sent to a designated testing laboratory for diagnostic testing (see sample collection section). These samples are recommended for deceased patients. e. Using full PPE (Apron, gloves, face mask and goggles/face shield) conduct vital signs at presentation and closely monitor vital signs at least every 4 hours (Pulse Rate, Blood Pressure, Respiratory Rate (RR), Temperature, SpO2). f. Commence oxygen if RR >30/min, or SpO2 < 90% (<92% in children). g. Commence IV fluids once BP < 90/60mmHg. h. If in a designated treatment centre: take samples for full blood count and C-reactive protein

Respond to action threshold

If a single case is confirmed:

- Assess for severity of disease
- Notify the appropriate and relevant authorities: State Epidemiologist for transfer of patient and inform the National EOC through email on NG-COVID19@ncdc.gov.ng and NCDC TollFree Number: 0800 9700 0010; SMS: 08099555577 and WhatsApp: 07087110839
- Continue supportive care as appropriate
- Prepare patient for transfer (See SOP on transfer of patient)
- Confirmed cases should be admitted to wards based on the severity of the illness – mild or severe, while critical cases should be admitted to ICU immediately.

Analyse and interpret data

- Person: Implement immediate case-based reporting of cases and deaths. Analyse age and sex distribution. Assess risk factors and plan disease control interventions accordingly.
- Time: Graph cases and deaths daily/weekly. Construct an epidemic curve during the outbreak.
- Place: Map locations of cases' households.

Laboratory confirmation	
Diagnostic test	Real Time PCR
Specimen	▪ A minimum of 1 nasal swab and 1 oropharyngeal swab should be collected. ▪ Sputum should be collected from patients with a productive cough. Only synthetic fiber swabs with plastic shafts should be used (Calcium alginate swabs or swabs with wooden shafts may contain substances that inactivate some viruses and inhibit PCR testing). ▪ Patients with mild disease: oropharyngeal swab, nasal swabs and sputum (if it can be produced) should be collected. ▪ Severely ill patients: endotracheal aspirate or bronchoalveolar lavage is recommended if the patient is intubated *Deceased patients: oropharyngeal swab and nasal swab*
When to collect the specimen	Collect specimen from the suspected cases
How to prepare, store, and transport the specimen	For PCR: *Oropharyngeal nasal sample collection:* Place swab into a single VTM. Wrap the lid of VTM tube with parafilm. Place the VTM tubes into a Falcon tube. Place the Falcon tube into a Ziploc bag and Place Ziploc bag into Geostyle container *Sputum specimen:* Place sputum sample into the leak-proof screw cap sputum collection cup or sterile-dry collection bottle. Place bottle into a Ziploc bag and Place Ziploc bag into Geostyle container *Transport specimen at:* 2° to 4°C; frozen ice pack *Storage:* ≤5 days; 4°C >5days; -20 to -70°C
Results	Diagnostic services for COVID 19 are carried out at designated laboratories nationwide. Contact the appropriate National authority.

References

- Nigeria Centre Disease Control. National Interim Guidelines for Clinical Management of Covid-19 ,June 2020

Annexes to Chapter 11

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

Annex 11A	AEFI - investigation form
Annex 11B	Acute flaccid paralysis - case investigation formA
Annex 11C	Cholera - case-based investigation form
Annex 11D	Guinea worm - case investigation form
Annex 11E	Maternal death - reporting form
Annex 11F	Measles - case investigation form
Annex 11G	Neonatal tetanus - case investigation form
Annex 11H	Tuberculosis - MDR and XDR TB - case-based reporting form
Annex 11I	Viral hemorrhagic fever - case report form
Annex 11J	VHF - case investigation form
Annex 11Ji	Acute or Chronic Viral Hepatitis Case Investigation Form
Annex 11K	IDSR Outbreak Line List
Annex 11L	Contact Listing Forms
Annex 11M	Community Alert Reporting Form
Annex 11N	Community-Based Surveillance (CBS) Suspected Diseases and Public Health Events Monthly Log Sheet

Please refer to http://ncdc.gov.ng/idsr_forms for samples of these forms

Annex 11A: Adverse Event 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:** Global Manual on Surveillance of Adverse Events Following Immunization" http://www.who.int/vaccine_safety/publications/Global_Manual_revised_12102015.pdf?ua=1	
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 Organisations ☐ 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
4.	**Collect specimens if appropriate:** □ from the patient □ the vaccine (and diluent if applicable) □ the syringes and needles
	Dispatch specimens to appropriate testing facility (laboratory, regulatory authority, etc.)
5.	**Analyse the data** □ Review epidemiological, clinical, and laboratory findings □ Summarize and report findings
6.	**Take action** □ Communicate with health staff □ Communicate findings and action to the parents and public □ Correct problem (based on the cause) by improving training, supervision, and/ or distribution of vaccines/injection equipment □ Replace vaccines if indicated

Background

Many public health events that have shaped history started at the local level as an outbreak, spread with travel, and were due to unknown causes until they were later explained. It is the willingness to call an alert about uncertain and worrying events that is the sign of a functional public health system.

By their nature these events cannot be precisely described but scenarios have been used to help illustrate what might raise concern. The IHR regulations contain a "decision instrument" to guide WHO members (Refer to **Section 2** of these guidelines). A "yes" answer to any two of the following four questions means that an event potentially constitutes a public health emergency of international concern that the WHO member must notify to WHO: (1) Is the public health impact of the event serious? (2) Is the event unusual or unexpected? (3) Is there a significant risk of international spread? (4) Is there a risk of restrictions on international travel or trade?

The report that there is a possible outbreak or unusual event may come from different sources including:

- Routine analysis of surveillance data (e.g. from routine reporting indicates an unexpected increase in cases of a notifiable disease
- A health worker (doctor, nurse or CHA, Environmental health Technician (EHT)) who reports a cluster of patients with a certain disease at their HCF or in the community
- A community leader who notices an unusual health event in their community and reports it to the authorities

Continued reporting of these events from the local level are contingent on the willingness of the district, County/Regional and National levels to listen and give credibility to the local levels. The responsiveness of the system to these alerts will define the likelihood that they will be reported and vigilance continues.

A literature review into the important obstacles for reporting Public Health Events of International concern found the following:

- Lack of knowledge among clinicians of the reporting process, including not knowing what diseases are reportable and not knowing what to report. Often there is confusion over who is responsible for reporting between the hospital and laboratory as well as confusion over whether laboratory confirmation is required prior to reporting.
- A lack of understanding of how information acquired through reporting is used and a perception that reporting diseases is a useless endeavour.
- The effect of actual or perceived negative consequences associated with reporting, such as extra work, intrusive requests for further information, media attention, judgment, punishment or blame, was stressed as an obstacle by multiple respondents.

Strategies to enhance completeness of notifiable disease reporting and IHR events include the following:

- Provide clear information to frontline staff about
- Why report unusual events?
- What events are reportable?
- How to report an unusual event?
- What happens after you report?
- Examples of event reporting
- Strengthen the ability to ask questions and get immediate feedback between clinicians and other key partners to encourage more complete reporting, such as by providing access to public health professionals in the case of emergencies and establishing a 24-hour toll free phone number for reporting. More frequent field visits or phone conferences can help as well.

Unexplained Cluster of Health Events or Deaths

- Feedback to clinicians and others in the reporting chain, showing them that preventative action is being taken as a result of their notification, helps emphasize the need for timely and complete reporting. Providing feedback to those reporting could increase trust and transparency in the exchange of information about unusual events, improve the perception of how reported information is used and demonstrate the consequences of not reporting
- All surveillance is built on good personal relationships or knowledge of the individuals involved in reporting. Encourage relationship building.

How reported information is handled:

The IHR has national focal points that contact their counterparts at WHO regional Offices. These regional offices enter epidemiological and other information necessary for risk analysis and management into an event management system that stores the information and makes it available. Feedback to countries through a national IHR focal point completes the reporting link and, if countries require support in outbreak response, a request is transmitted back to the WHO.

This most recent guidance from WHO/AFRO focuses on Public Health Events (PHE) of initially unknown etiology, which are PHEs for which the cause has not yet been determined. For such events, the One Health approach is recommended, where the ministry of health works in close collaboration with other ministries and multisectoral partners to enhance teamwork and improve efficiencies in preparedness, response, and monitoring and evaluation (M&E).

Surveillance goal	• The assessment of whether an event may potentially be of international significance occurs at the national level, guided by Annex 2 of the IHR (2005) which is not intended to be used sub-nationally. • In this definition of an "event" or death sensitivity is prioritized to facilitate reporting and to reduce delays, emphasizing the fact that there should be no negative consequences f\or a potentially false signal. • Detect cases. • Immediate case-based reporting of all cases. Weekly summary reporting of cases for routine surveillance and outbreaks.

Standard case definition	These events are not well detailed or standardized at this time. In the IHR 2005 two events were chosen to help guide the surveillance functionality and allow early detection and response. • Unexplained deaths • Clusters of illness Community Alert Triggers Unknown health problems grouped together. Any health problem that you don't know about that is happening to many people or animals in the same community. Examples include: • any outbreak or cluster: A group of people are sick (or die) with similar symptoms in one place (community, school, or health facility) at the same time • any unusual death or cluster of deaths: two or more people die of unknown cause after suffering from similar symptoms in one place (e.g. village, school, or HCF) at the same time • a group of people that become sick or have another unusual reaction after consuming the same food or drinking from the same water source
	• any person that becomes sick with symptoms that have not seen before or not seen for a long time (e.g. an emerging infectious disease is suspected) • community member(s) become sick around the time that animals are sick or die in their village • Sick or dead animals of unknown cause Health Facilities The proposed definition for events to be reported by clinicians and **health care facilities** is: "Any outbreak of disease, OR any uncommon illness of potential public health concern, OR any infectious or infectious-like syndrome considered unusual by the clinician, based on frequency, circumstances of occurrence, clinical presentation, or severity". Any infectious or infectious-like syndrome considered unusual by the clinician based on: • Frequency- e.g., a sudden unexplained, significant increase in the number of patients, especially when it occurs outside the normal season. • Circumstances of occurrence – e.g., many patients coming from the same location or participating in similar activities. • Clinical presentation- e.g., a patients health rapidly deteriorating out of proportion to the presenting symptoms and diagnosis. • Severity – e.g., a number of patients failing to respond to treatments. • Patient with history of exposure to animals (wild or domestic) that presents with unusual clinical presentation The proposed definition of a reportable event for laboratories is: "Any situation considered unusual related to received samples (frequency, circumstances of occurrence or clinical description) OR test results (unexpected number of the same species/subspecies, strain type/subtype or antimicrobial resistance pattern, or failure/uncertainty in diagnostics)".

Respond to alert threshold	If a single unexplained death or cluster of deaths or illness is suspected: • Report the suspected case or cases immediately using IDSR alert form • Begin active surveillance • Conduct a case-based investigation. • Notice events that cluster by person, place or time that are of concern.
Respond to action threshold	If a case is validated by district/County or Regional or National level will decide which actions to take. They may include the following response measures for routine outbreaks until Public Health Emergency RRT's may be involved. See **Section 6** of these IDSR guidelines. • Infection control measures using standard precautions among cases and with health workers. • Safe and dignified burial • If animals are involved, communicate and coordinated with County Livestock Officer or Ministry of Agriculture official
Analyse and interpret data	**Time:** Track onset of illness or symptoms and time (date) of death. **Place:** Plot location of cases by household and community. Investigate the circumstances and possible modes of transmission in each case thoroughly. Examine the possibility of other involved areas. Look for environmental associations. Establish if there is a travel history. Plot cases on a map and look for clusters or relationships between the location of the cases and the health event being investigated **Person**: Count cases and track demographic factors. Analyse age distribution, occupational association and recent exposures. Assess risk factors.
Laboratory confirmation	Diagnosis of public health events of international concern including unexplained death and Clusters of illness are made by their appearance or after considering other more familiar options. There is no specific test that can be done.
References	• MacDonald et al.: Detection of events of public health importance under the international health regulations: a toolkit to improve reporting of unusual events by frontline healthcare workers. BMC Public Health 2011. 11:713. • International Health Regulations 2005 http://www.who.int ihr/9789241596664/en/ 2nd edition. ISBN: 9789241580410 • Public health events of initially unknown etiology: A framework for preparedness and response in the African Region. WHO Regional Office for Africa, 2014. ISBN: 978 929 023 2476 (NLM Classification: WA 105)

Annex 11B: Acute Flaccid Paralysis-case Investigation Form

OFFICIAL USE

Epid Number:_____

_____/_____/_____

IDENTIFICATION

District:_____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:

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

Question	Answer	Site of Paralysis	
		LA	RA
Fever at Onset of paralysis Paralysis progresses <= 3 days			

(completed by district team) Province District Year Onset Case Number Received:

Flaccid & sudden paralysis Onset of paralysis:

Asymmetrical ____/_____/_____

Asymmetrical ____/_____/_____

AFTER INVESTIGATION, WAS IT TRUE AFP? 1= Y, 2= N

If "No," then the rest of the form does not need to be completed. Mark "6" for Final Classification.

VACCINATION HISTORY

Total Doses of Polio: 99= Inconnu

Birth _____/_____/_____ 3rd _____/_____/_____

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 district Date results receive by district

/ / / / / /

Date isolate sent by national Lab to regional lab Date differentiation result sent by regional lab

Date differentiation result received by district

Primary Isolation	P1	P2	P3	NP-Ent	W	W	W	V1	V2	V3	P-Ent

FOLLOW UP EXAMINATION

Date of follow up examination: _____/_____/_____ Findings at Follow-up: □□

1= Residual paralysis 3= Lost to follow-up

LA RA 2= No residual paralysis 4= Death before follow-up

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 11C: Cholera - Case-Based Investigation Form

Area A : Patient and clinical laboratory related information		
	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	Patient's residencial Adress	
10	Village/Town	
11	Neighborhood	
12	District	
13	Province	
14	Country	
15	Date of onset (first symptoms) (ddmm/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 Drugs to which the vibrio strain is resistant	
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 B: Risk factor search (Information to be obtained from water and sanitation group of the investigation)

Mapping Potential Hazards

	Variables/Questions	**Answers**
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 11D: Guinea Worm - Case Investigation Form

GUINEA WORM ERADICATION PROGRAMMECASE 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: District: Region:

Date Case Reported: (dd/mm/yyyy)___/___/_____ Reported by: Position:

Date Case Investigated: Investigated by: Position:

II. Patient Information and Place of Residence[1]

Name: Father's Name/Landlord's Name:

Age: Sex: Occupation: Ethnicity

Resident Address: Village: Zone:

Area/Sub District: District: Region:

Setting: Urban/Rural Land Marks:

Place of residence is same as the reporting village: YES/NO Residence since when(in months):

(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 District:

District: Region: Country:

IV. Travel History of patient in the last 10-14 months

Date From:	Date To:	Village:	Sub District	District:	Region:

Possible water sources that the patient might have contaminated with location details and GPS:

Name	Lattitude	Longitude	Type	Source	Check box if Treated with Abate and Date

1

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*

V. Sign and symptom

What was the first sign/symptom before the emergence of worm? Blister/Itching/Swelling/Others,Specify

Emergence of guinea worm: YES/NO No of Worms:_____
Is this the first guinea worm emerged this year? YES/NO

Date of the First guinea worm emerged:___/___/_____ Was the case detected before worm emerged? YES/NO

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

Date worm detected	Date of guinea-worm completely expelled	Date confirmed	Regular emergence by supervisor:	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:

GUINEA WORM ERADICATION PROGRAMMECASE 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*

Date sent to National:	Received By:	Date Received by:
For National Secretariat Only:		
Did you send it for confirmation?Yes/No	Date sent:	Sent To:
Date Result Received		
Result:		
IX. Other Information		
Use of cloth filter: YES/NO 4-never	Frequency of changing filters 1-rarely; 2-sometimes; 3-always;	
Remarks:		
Person who completed this form:		
NAME	POSITION	CELL PHONE NO
SIGNATURE		
Disease Control or Surveillance Officer:		

Annex 11E: Maternal and Perinatal Death - Reporting Forms

FEDERAL MINISTRY OF HEALTH

MATERNAL DEATH REVIEW FORM 1 - NOTIFICATION

(MPDSR FORM 1)

Note:

This form must be completed by the attending officer in the health facility or community based informer for all maternal 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

This form must be completed immediately after death by the last person who attended to the patient, and submit to the head of the health Facility or person responsible for maternal health in the LGA for onward transmission to the appropriate health authorities – in the State and/or the Federal Ministry of Health within 24 hours.

1. Date of Death being reported (dd/mm/yy) or

Date this maternal death occured (day/month/year):.....

2. Time of Death being reported or

Time of death (specify "During pregnancy, At delivery, during delivery, during the immediate post partum period, or long after delivery").....

3. Date of Admission to Facility (if on admission) (dd/mm/yy):.....

4. Name of Facility where death occurred:.....

5. Local Government Area:.....

6. State:.....

7. Place where death occurred: (Tick √ one box)

a. [ ] Tertiary Health Institution
b. [ ] General Hospital
c. [ ] Primary Health Care Centre
d. [ ] Faith based Institution
e. [ ] Private for profit
f. [ ] TBA's place
g. [ ] On the way/ before arrival to health facility
h. [ ] Home
i. [ ] Other (specify) .....

8. Ownership of Facility: (Tick √ one box)

a. [ ] Federal Government
b. [ ] State Government
c. [ ] Local Government Council
d. [ ] Faith –based
e. [ ] Private
f. [ ] other (specify) .....

9. Patient Identity:.....

10. Case Note No.(if hospitalized): .....

11. Age (years): .....

12. Gravidity(Total numbers of previous pregnancies): .....

13. Parity(Total numbers of previous deliveries): .....

14. Suspected cause of death: (Tick √ one box)

a. [ ] Hemorrhage
b. [ ] Pre-eclampsia / eclampsia
c. [ ] Puerperal sepsis
d. [ ] Prolonged/Obstructed labour
e. [ ] Ruptured uterus
f. [ ] Complications of abortions
g. [ ] Ectopic pregnancy
h. [ ] Other (specify) .....

15. At the time of death, was the baby delivered? (Tick √ one box)

a. [ ] Yes
b. [ ] No

16. Condition of the baby at the time of delivery (Tick √ one box)

a. [ ] Alive
b. [ ] Fresh Still birth
c. [ ] Macerated still birth
d. [ ] Not applicable

Name of Person reporting: ..... Designation: .....

Telephone numbers.....

Emails.....

Address: .....

Signature: ..... Date: .....

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	District/State/Local Governement	
3	Reporting Site	
4	How many of such maternal deaths occurred 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-District-site-maternal death rank)	
8	Maternal death place (Community, health facility, district 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 deceased 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	

FEDERAL MINISTRY OF HEALTH

PERINATAL DEATH NOTIFICATION FORM (PNDR 1)

GENERAL INSTRUCTIONS

- This form must be completed for all perinatal/Newborn deaths (including stillbirths and neonatal deaths).
- This form must be completed immediately after death by the last person who attended to the patient.
- A copy should be submitted to the LGADSNO Officer , who will report to the LGA M&E officer and the MCH coordinator of the State Ministry of Health (SMOH).
- Coding must be done at hospital level with code of HF (first 4 letters), LGA and state and MD individual code number for each deceased.

DETAILS OF THE DECEASED AND MOTHER

1. **PND Case Number:** ☐☐☐☐ / ☐☐ / ☐☐ / ☐☐☐
2. **File Number (*health facility*):** ☐☐☐☐☐☐☐☐☐☐

3. **Physical Address or locality where mother lived:** (LGA, Name of village, Code)

4. **Family Contact No:**

5. **Age of mother (years):** ☐☐ (estimate if age is unknown)

6. **Locality where death occurred: LGA:** _____ **State:** _____

7. **Place where death occurred: (√ one box)**

1. ☐ Tertiary Teaching Hospital
2. ☐ Federal Medical Centre
3. ☐ General Hospital
4. ☐ Primary Health Care Centre
5. ☐ Stand alone Maternity Unit
6. ☐ TBA
7. ☐ Home
8. ☐ On the way/before arrival at H/F
9. ☐ Other (specify) _____

8. **Ownership of health facility:** (√ one box)

1. ☐ Federal MOH
2. ☐ State MOH
3. ☐ Private
4. ☐ LGA
5. ☐ Faith-based
6. ☐ Other

9. **Name of Health Facility:** _____

10. **Primary cause of death:** _____

11. **Final cause of death:** _____

12. **Modifiable contributing factors:**

13. Classification of perinatal/Newborn death (√ one box):

☐ Neonatal death ☐ Fresh stillbirth ☐ macerated stillbirth

14. Birth weight: ☐☐☐☐ grams **15. Gestation at birth:** ☐☐ weeks

16. Date of Birth

17. Date of ☐☐/☐☐/☐☐ **18. Date of** ☐☐/☐☐/☐☐

Admission: **Death**

19. Name of Reporting Officer: _____

20. Designation: _____

21. Date: ☐☐/☐☐/☐☐

22. Signature: _____

The form must be completed for selected perinatal deaths, comprising of stillbirths and neonatal deaths		
Questions / Variables		Answers
Identification		
1	Country	
2	District/State	
3	Reporting site/facility	
4	Perinatal death locality (village or town or LGA)	
5	Place of death (community, health facility, district hospital, referral hospital or private hospital, on the way to health facility or hospital)	
6	Date this perinatal death occurred (day/month/year)	
7	Record's unique identifier (year-country code-district-site) for the mother.	
8	Record's unique identifier (year-country code-district-site) for the baby (diseased).	
Pregnancy progress and care (Perinatal death history and risk factors)		
9	Mother's age (in years)	
10	Type of pregnancy (singleton/twin/higher multiples)	
11	Did the mother of the deceased receive any antenatal care? (Yes/No/Unknown),	
12	If yes to 11, how many visits?_____	
13	Did the mother of the deceased have malaria? (Yes/No/Unknown)	
14	If yes to 13, did the mother receive treatment _ (Yes/No/Unknown)	
15	Did the mother of the deceased have pre-eclampsia disease ? (Yes/No/Unknown)	
16	If yes to15, did the mother receive any treatment? (Yes/No/Unknown)	
17	Did the mother of the deceased have severe anaemia (HB,7g/dl)? (Yes/No/Unknown)	
18	If yes to 17, did the mother receive any treatment? (Yes/No/Unknown)	
19	Did the mother of the deceased have recommended maternal immunizations (e.g. tetanus toxoid) (Yes/ No/Unknown)	
20	Did the mother of the deceased have Rhesus factor (Rh) or ABO incompatibility? (Yes/ No/ Unknown)	
21	If Rhesus positive, did the mother of the deceased receive Anti-D injection during this baby's pregnancy? (Yes/ No/Unknown)	
22	Did the deceased present in an abnormal Lie (including breech presentation)? (Yes/ No/ Unknown)	
23	What was the HIV status of the mother? (choose "HIV+; HIV-; or Unknown HIV status")	
24	What was the status of the syphilis test of mother? (Positive (+) or negative (-))	
Labour, birth, puerperium		
25	Date of birth (day/month/year)	

26	Attendance at delivery (Nurse/midwife/doctor/other-specify).	
27	Was fetal heart rate assessed on admission? (Yes, No)	
	What type of delivery was it? (choose one from "1=Vaginal non assisted delivery, 2= vaginal-assisted delivery (Vacuum/forceps), or 3=Caesarean section	
28	Sex of the baby (1=male; 2=female, 3=ambiguous)	
29	Birth weight in grams(>=2500; 1500-2499 (LBW); 1000-1499g (VLBW); <1000 (ELBW))	
30	Did the mother of the deceased have premature rupture of membranes (PROM) (Yes/No/ Unknown)	
31	Did the mother of the deceased have foul smelling liquor?	
32	Gestational age (in weeks) Method of estimation: Ultrasound /LMP (DD/MM/YY)	
33	How long (hours) was the duration of labor	
	Information on the death and actions taken before and after the death	
30	If stillbirth – gestational age (in weeks) of the deceased	
31	If neonatal death – age (in days) of the deceased	
32	If the deceased baby was born alive what was the APGAR Score ?.	
33	If the deceased baby was born alive, wasresuscitation with bag and mask conducted?.	
34	If the deceased baby was born alive was he/she referred to any health facility or hospital? (Yes/No/Unknown)	
35	If the deceased baby was born alive did he/she receive any other medical care beyond resuscitation? (Yes/No/Unknown)	
	If yes, specify where and the treatment received:* I.V. Fluids; Blood/Plasma transfusion; Antibiotics; Oxygen; Other medical treatment;	
	Primary cause of death:	
	Secondary cause of death:	
	Maternal condition (if applicable)	
34	Timing of death (1-fresh stillbirth; 2-macerated stillbirth)	
35	Any physical malformation noted on the deceased? (Yes/No)	
	If yes, type of birth defect (with full description):	
	Investigator's report	
36	Analysis and interpretation of the information collected so far (investigator's opinion on this death)	
37	Perinatal death notification date (day/month/year)	
38	Investigator (Title, name and function)	

Still Births and Neonatal Deaths Weekly Summary Reporting Form

The form must be completed for stillbirths and neonatal deaths								
Questions/Variables								**Answers**
Identification								
1	Data for the month of							
2	Country							
3	LGA							
4	Reporting site/facility							
5	Births							
		Total Births	Stillbirths deaths			Neonatal		
			Antepartum	Intrapartum	Unknown	Early	Late	
	<1000 g (ELBW)							
	1000–1499 g (VLBW)							
	1500–1999 g (LBW)							
	2000–2499 g (MLBW)							
	2500 + g							
	Total							
Pregnancy progress and care (Perinatal death history and risk factors)								
6	Multiple pregnancies							
7	Born before arrival							
8	Mode of delivery							
	Normal vaginal delivery		Vacuum		Forceps		Caesarean	Unknown
9	Gestational age							
	Term	Post-term	Ext preterm (<1000g)		Very preterm (1000-1499)		Mod preterm (1500-2499)	Unknown
10	HIV status							
	Negative			Positive			Unknown	
11	Syphilis serology							
	Negative			Positive		Unknown		
12	Maternal age							
	>34 y		20-34		18-19 y		<18 y	Unknown

Annex 11F: Measles - Case Investigation Form

MEASLES CASE INVESTIGATION FORM	
Variable/Description	**Value/Answer**
Country	
ID number	
Reporting district	
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	
District of Residence	
Province	
Sex (M/F)	
Date seen at health facility (day/month/year)	
Date health facility notified district (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 district (day/month/year)	
Date received form at district (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 district (day/month/year)	
Date district received lab results (day/month/year)	
Name, title and function of reporting officer	

Annex 11G: Neonatal Tetanus-Case Investigation Form

Official Use **Epid Number:** _____-_____-_____-_____ Received

Only (completed by district team) Province District Year Onset Case Number at National _____/_____/____

IDENTIFICATION

District:_____ Province: _____

Nearest Health Village/ Town/

Facility to Village:_____ Neighborhood: _____ City:_____

Address:_____

Name(s) of patient: _____Mother:_____

Sex: 1 = Male, 2 = Female Father:

NOTIFICATION/INVESTIGATION

Notified **Date** **Date Case**

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

Questions	Answers
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

Questions	Answers
Mother received antenatal care?	
How many prenatal visits?	
Attended by a trained TBA/midwife?	
If attended by a trained TBA/midwife, give name	
Attended by doctor/nurse?	

BIRTH OF INFANT

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

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

KEY

*** 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?	
Normal cry and suck during first 2 days?	
Stopped sucking after 2 days?	
Arched back?	
Stiffness?	
Onset of symptoms:	

Spasms or Convulsions?	
Complications	
Did the baby die?	
Age at death:	Days
Age of onset in days:	Days (99=Unknown)

TREATMENT

Date of admission

_____/_____/_____

Medical record number:

_____

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

COMMENTS RESPONSE (Please use the following key, 1=Y, 2=N, 9=U, where applicable.

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

Date of response:

_____/_____/____

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

INVESTIGATOR

Name:_____ Title:_____

Unit:_____ Address: _____

_____

Phone:_____

Annex 11H: Tuberculosis - MDR and XDR TB - Case-Based Reporting Form

1...

Case-based Multi-Drug Resistant and Extensively Drug Resistant Tuberculosis Report Form	
Country:	**Year:**

Quarter:	**Month:**

Case unique Identifier (Detection year Country code-Number in Tb Register)	**Sex** (F/ M)	**Age** (Yrs)	**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 /Relap se / After default /After failure of first treatment /After failure of re-treatment /Transfer in /Other)	**Patient Treatm ent Status** (On treatment /Not on treatment / Don't Know)	**HIV Status** (positive /negative / Unkno wn)

2

Case-based Multi-Drug Resistant and Extensively Drug Resistant Tuberculosis Report Form	
Country:	**Year:**

Drug Susceptibility Test Results (S=sensitive; R=Resistant; I=intermediate; U=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 11I: 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	District	
14	Province	
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 11J: Viral Hemorrhagic Fever – Case Investigation Form

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

Identity of the patient

First name:_____Surname_____ Nickname_____

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

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

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

Village/Suburb _____Country _____GPS lat_____long_____

Nationality:_____Ethnic group_____

Profession of the patient *(tick off the right answer)*

E Health staff, details:

Name of health care facility_____ ___ Service qualification

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

E Pupil/ Student E Farmers E Others

Status of the patient

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

Place of death: E Community, name village:_____Country_____

E Hospital, name and service _____Country_____

Place of the funerals, name village: _____Country_____

History of the disease

Date of onset of symptoms: __/___/___

Name of the village where the patient got ill:_____Country_____

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

If Yes, indicate the places and the country:

Village _____Health Centers _____Country_____

Health Centers _____Country_____

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

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

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

- 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

Annex 11Ji: Acute or Chronic Viral Hepatitis Case Investigation Form

Acute or Chronic Viral Hepatitis Case Investigation Form		
No.	Variable/Description	Answer
General characteristics – identification		
1	Epid. Number (e.g. Country code-RRR-DDD-YY-NNN)	Country code- _ _ _ - _ _ _ - _ _ - _ _ _
2	GPS coordinates: Latitude; Longitude	
3	Reporting Region /Province	
4	Reporting District	
5	Reporting health facility	
6	Patient Health Facility Identification Number	
7	Date seen at health facility (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
8	Date health facility notified district (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
9	Patient Surname	
10	Patient Other Names	
11	Name of mother/father/ Care taker if child ≤12 years	
12	Date of birth (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
13	Country of Birth	
14	Age (Completed Years, Months, Days)	Years ☐ Months ☐ Days ☐
15	Sex: M=Male F=Female	
16a	Patient's residential Address: (House Number, Location, Community of residence)	
16b	Telephone number	
16c	Occupation	
16d	Place of work	
17	Urban/Rural	
18	Sub-district of Residence	
19	District of Residence	
20	Region of Residence	
21	Country of Residence	
Clinical characteristics and testing circumstances		
22	Clinical diagnosis	Acute ☐ Chronic ☐
23	Acute Onset	Yes ☐ No ☐
24	If Acute, Onset Date (first symptoms) (dd/mm/yyyy)	
25	Systematic testing (Screening)	Yes ☐ No ☐
26	History of chronic hepatitis	Yes ☐ No ☐
27	In-patient or Out-patient?	

Acute or Chronic Viral Hepatitis Case Investigation Form		
No.	Variable/Description	Answer
28	If In-patient, date of admission (dd/mm/yyyy)	
29	Clinical Signs and Symptoms	Jaundice: Yes ☐ No ☐ Others:
Prior Diagnosis and Treatment History		
30	Previously identified with chronic HBV infection	Yes ☐ No ☐ Unknown ☐
31	Previously identified with chronic HCV infection	Yes ☐ No ☐ Unknown ☐
Hepatitis Vaccination History		
32	Has the person ever received at least one dose of hepatitis A vaccine?	Yes ☐ (_____doses) No ☐
33	Has the person ever received at least one dose of hepatitis B vaccine?	Yes ☐ (_____doses) No ☐
34	Has the person ever received at least one dose of hepatitis E vaccine?	Yes ☐ (_____doses) No ☐
35	Date of last vaccination (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
General Exposures		
36	Is the person health-care worker exposed to blood through patient care?	Yes ☐ No ☐ Unknown ☐
37	Is the person a man who has sex with other men?	Yes ☐ No ☐ Unknown ☐
38	Does the person undergo chronic haemodialysis?	Yes ☐ No ☐ Unknown ☐
39	Does the person inject recreational drugs?	Yes ☐ No ☐ Unknown ☐
40	Is the person involved in a reported, identified outbreak?	Yes ☐ No ☐ Unknown ☐
Possible exposures in the 2–6 weeks before onset (acute hepatitis only)		
41	Was there contact with patient(s) with the same symptoms?	Yes ☐ No ☐ Unknown ☐
42	Did the person drink water from a well or other unsafe water source?	Yes ☐ No ☐ Unknown ☐
43	Did the person eat unwholesome food e.g. raw, uncooked shellfish?	Yes ☐ No ☐ Unknown ☐
44	Is the person a child or a staff member in a day-care centre?	Yes ☐ No ☐ Unknown ☐
45	Did the person travel to an area highly endemic for hepatitis A?	Yes ☐ No ☐ Unknown ☐
Possible exposures in the 1–6 months before onset (acute hepatitis only)		
46	Did the person receive injections in a health-care setting?	Yes ☐ No ☐ Unknown ☐

Acute or Chronic Viral Hepatitis Case Investigation Form		
No.	Variable/Description	Answer
47	Was the person hospitalized?	Yes ☐ No ☐ Unknown ☐
48	Did the person undergo surgery?	Yes ☐ No ☐ Unknown ☐
49	Did the person receive a blood transfusion?	Yes ☐ No ☐ Unknown ☐
50	Did the person go to the dentist?	Yes ☐ No ☐ Unknown ☐
51	Was there sexual contact with someone with hepatitis B?	Yes ☐ No ☐ Unknown ☐
52	Was there household contact with someone with hepatitis B?	Yes ☐ No ☐ Unknown ☐
53	Was there unprotected sex with non-regular partner(s)?	Yes ☐ No ☐ Unknown ☐
54	Skin piecing and tattooing	Yes ☐ No ☐ Unknown ☐
55a	Outcome (1=Alive; 2=Dead; 3=Unknown)	
55b	If dead, Date of death (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
56	Final classification (1=Lab Confirmed; 2=Confirmed by Epidemiological linkage; 3=Discarded (lab negative); 4= Pending (Suspected with specimen lab results pending)	
57	Date form sent to district (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
58	Date received form at district (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
59	Person completing form: Name, Designation, Tel No. E-mail address, Signature Name of Head of Health Facility, Tel No., E-mail	
Viral Hepatitis Laboratory Reporting Form		
Part I. Referring health worker to complete this form and send a copy to the lab with the specimen		
	Variable	Answer
1	Date sample collected (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
2	Date sample sent to Laboratory (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
3	Type of sample (specify)	
4	Date laboratory received sample (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/

Acute or Chronic Viral Hepatitis Case Investigation Form		
No.	Variable/Description	Answer
5	Epid Number (e.g. GHA-GAR-DDD-YY-NNN) **	GHA- _ _ _ - _ _ _ - _ _ - _ _ _
6	Patient name(s)	
7	Sex: (M = Male F = Female)	
8	Age (Completed Years, Months, Days)	Years Months Days
9	Person sending sample: Name, Designation, Tel No., E-mail	
Part II. Laboratory Officer to complete this section and return the form to district and clinician		
Laboratory Name and location		
10	Sample condition 1 = adequate (good) 2 = not adequate (not good)	
11	Lab Results: Hepatitis A: Anti-HAV IgM Hepatitis B: HBsAg or IgM anti-HBc Hepatitis C: Anti-HCV Hepatitis D: HBsAg or IgM anti-HBc plus anti-HDV Hepatitis E: IgM anti-HEV and/or IgG anti-HEV	Anti-HAV IgM Pos Neg Unknown Anti-HBc IgM Pos Neg Unknown HBsAg Pos Neg Unknown Anti-HCV Pos Neg Unknown HCV RNA Pos Neg Unknown HCV core Ag Pos Neg Unknown HCV genotype Pos Neg Unknown Anti-HEV IgM Pos Neg Unknown
12	Other lab results	
13	Date laboratory sent results to Clinician (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
14	Date laboratory sent results to District (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
15	Date district received laboratory results (dd/mm/yyyy)	/__ __/__ __/__ __ __ __/
16	Name of Lab Personnel completing form Phone number Signature E-mail address Date	

Annex 11K: IDSR Outbreak Line List

A line list captures the relevant information from each reported case for analysis and action. Listing each case and their information will help provide the data needed to assess characteristics of cases to help guide response activities. This is an important tool to collect information and Analyse quickly.

During an outbreak, the line list must be established and used as a primary data collection tool. The columns under the IDSR Line List should be changed based on the situation. The information from each reported case should be added to a single row in the spreadsheet. This paper form should be routinely incorporated in the IDSR Routinely Reported Database to facilitate comprehensive analysis and reporting to next level daily as well as on weekly basis.

SAMPLE LINE LIST:

s/n	Name of Patient	District or Councils	Ward	Locality Mtaa/ Kijiji	Age	Age type	Age group	Sex M = Male or F = Female	Occu -pation	Date of Onset	Date seen at HF	Diarrhoea Yes/No	Vomiting Yes/No	Sever Dehydration Yes/No	Specimen	Results	Hospitalized Yes/No	Place of Admission	Treatment given	Outcome	Date of Discharge or Death	Comments
1																						
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						

Annex 11L: Contact Listing Forms

Case`s IDSR ID:_____ Case Name:_____ Case Sex: M____F_____

Case`s home/village address_____ Case`s location (District/County)_____ Case`s Region/County____

Case`s Head of Household_____ Date of symptom onset:____/__/___ Date of hospitalization__/__/__

No.	Surname	First Name	Sex M/F	Age. Yrs	Phone Number	Head of Household	Village	Disrict	Relationship to case	Date of Last Contact (dd/mm/yy)	Type of Contact (1,2,3,List all)

Contacts =

1. Slept, ate or spent timein the same household as case
2. Direct physicalcontact with the case (dead or alive)
3. Has touched or shared linens, clothes or dishes/eating utensils of the case, body fluids (blood, urine, feaces,semen)
4. Has touched his/her body fluilds (blood, urine, feaces,semen)
5. Need to be followed for other reason, specify (e.g. contact with an affected animal)

Completed by:(Print Name)_____ Title:_____ Date:_____

Reporting Instructions

Return this completed form to the outbreak investigation team

Annex 11M: Community Alert Reporting Form *[send this form immediately to your supervisor or nearby health facility]*

Community alert reporting form **[Send this form immediately to your supervisor or nearby health facility]**	
Name of person reporting:_____	
Designation:_____Community_____	
Contact number:_____	
Type of illness/ Event to be reported (please describe):_____	
Date reporting (Date: day, month, year)	
What happened?	
When did this happen? (Date: day, month, year)	
Where did this happen? (Location-community, ward/sub-district, district)	
How many have been affected?	
Has anyone died? If yes, how many	
Are there sick or dead animals involved? Is the event ongoing?	
History of travel of affected individuals	
Has the event been triaged? Y/N	
Has the event been verified? Y/N	
Any other relevant information you might have	

Annex 11N: Community-Based Surveillance (CBS) Suspected Diseases and Public Health Events Monthly Log Sheet

This form is a summary of all the diseases/events identified during the month. It is completed by the community focal person and submitted monthly to nearest health facility/sub-district surveillance focal person every month.

Community-Based Surveillance Suspected Diseases and Public Health Events Monthly Log Sheet								
Community:_____			**Ward/Sub-district_____**					
Month_____						**Year_____**		
Type of illness/ Event	When did this happen (DD/MM/YYY)	Where did this happen (Community)	How many have been affected	Sex M/F	Age	How many died	Has the event been verified? Yes/No	what action was taken

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