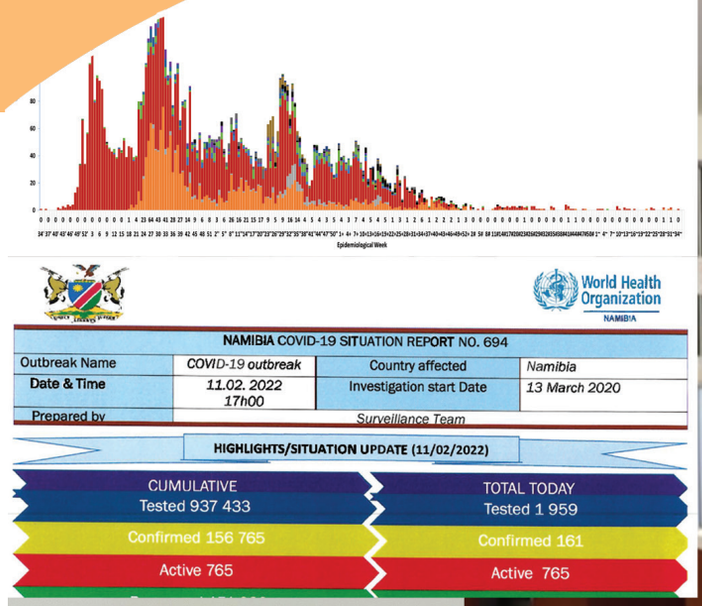
Republic of Namibia

Ministry of Health and Social Services

NATIONAL TECHNICAL GUIDELINES FOR INTEGRATED DISEASE SURVEILLANCE AND RESPONSE



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NATIONAL TECHNICAL GUIDELINES FOR INTEGRATED DISEASE SURVEILLANCE AND RESPONSE

Part I introduces all ten sections of the Integrated Disease Surveillance and Response Technical Guidelines

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In planning to update these guidelines, suggestions and advice for improving the recommendations were sought and gratefully received from the Integrated Disease Surveillance and Response (IDSR) development teams who prepared the 1st and 2nd editions. This revision builds on the technical expertise from more than 100 surveillance and disease experts at the World Health Organization (WHO), Centers for Disease Control and Prevention (CDC) and Ministries of Health in African countries who conceived and produced the 1st and 2nd Editions.

The revision process involved internal Ministry of Health and Social Services (MoHSS) consultations, followed by a wider consultation that involved a series of meetings with stakeholders and partners. In addition, the IDSR Task Torce was constituted to help with the adaption and revision process. The final draft was peer-reviewed by the Ad Hoc Task Force as well as during a final partner consultative validation meeting held in August 2021.

The technical guidelines were revised through technical and financial support from the WHO Country Office in Namibia (WHO-Namibia) and the WHO Regional Office, Brazzaville, Republic of Congo.

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FOREWORD

In 1998, the World Health Organization Regional Office for Africa (WHO - AFRO) together with its technical partners adopted a strategy for developing and implementing comprehensive public health surveillance and response systems in African countries. This was initially called Integrated Disease Surveillance (IDS). However, to highlight the linkage between surveillance and response, the strategy was later re-named Integrated Disease Surveillance and Response (IDSR). The first edition of the IDSR technical guidelines was adopted in 2003 in Namibia. Although progress towards a coordinated, integrated surveillance system was variable, almost every country in the region, invested human and material resources to strengthen capacities for public health surveillance systems in order to prevent, timeously detect, and respond appropriately to public health threats.

The coming into force, in 2007, of the International Health Regulations (IHR 2005), and the emergence of new diseases, conditions and events as well as the formulation of strategies for Disaster Risk Management (DRM) resulted in the need to revise the first edition of the IDSR technical guidelines. The increasing burden of non-communicable diseases also needed to be addressed. Furthermore, there was the need to strengthen community-based surveillance for early detection, rapid confirmation and response to public health threats. Alignment with broader system strengthening objectives was also required resulting in the second edition of the IDSR guidelines being developed in 2010.

Despite the availability of the IDSR technical guidelines, the country continues to face challenges in public health surveillance systems, with respect to the capacity to prevent, detect and respond to public health threats.

I am honored to unveil the third edition of the IDSR technical guidelines that has been adapted by the Ministry of Health and Social Services (MoHSS) with the active participation and involvement of all relevant stakeholders.

It is worth noting that, many Public Health Events (PHEs) and emergencies and their associated risk factors can be prevented, or their effects mitigated. However, health systems in most districts remain inadequate. To avert and mitigate the effects of future health security risks and emergencies, all districts should implement these IDSR technical guidelines. The guidelines recommend thresholds for action for priority diseases, conditions, public health events and for responding to alerts. Using these action thresholds can be lifesaving. I therefore urge all levels of the health system to fully implement this third edition of the IDSR technical guidelines everywhere in the country because it explicitly describes what needs to be established at each level of the health system in order to detect, confirm and respond to diseases, conditions and health events that are responsible for all preventable illnesses, death and disability in local communities.

The cost of an effective public health surveillance is relatively low compared to many other strategies. I appeal to health workers at all levels, national, regional, district, health facility, and community - to embrace the IDSR technical guidelines and strengthen capacities for preparedness, alert and response for health security everywhere in Namibia.

The guidelines are intended for use as a general reference for surveillance activities at all levels for improving early detection and response of epidemic prone diseases. It has a set of standard case definitions for threshold levels that initiate action for responding to specific diseases. It is also a stand-alone reference for level-specific responsibilities and a resource for developing training, supervision, monitoring and evaluation of surveillance activities.

These guidelines should be used by officials actively involved in surveillance and response activities related to outbreaks, emergencies and other public health events:

- health workers at all levels in both the private and public health sectors
- surveillance focal persons
- laboratory personnel
- regional and district health management teams
- data managers
- administrative data clerks
- IHR National Focal Point and other sectors implementing IHR
- competent authorities at points of entry
- veterinary officials
- wildlife officials
- environmental health practitioners
- health training institutions
- logisticians, and
- other public health experts, including NGOs.

Finally, I appeal to you all to ensure that this third edition of the IDSR technical guidelines are implemented within a broader context of health system strengthening: better coordination between human, animal and environmental health surveillance and other sectors involved in the 'One Health' approach, improved use of laboratory network capacity in surveillance and response, and better community engagement in public health interventions.

.....

Mr Ben Nangombe
Executive Director
Ministry of Health and Social Services

ACRONYMS

AAR	After Action Review
ADRs	Adverse Drug Reactions
AEFI	Adverse Events Following Immunization
AFP	Acute Flaccid Paralysis
AFRICA CDC	Africa Centres for Disease Control and Prevention
AHFS	Acute Haemorrhagic Fever Syndrome
AIDS	Acquired Immunodeficiency Syndrome
AMR	Antimicrobial Resistance
ARDS	Acute Respiratory Distress Syndrome
AST	Antimicrobial Sensitivity Testing
AWD	Acute Watery Diarrhoea
CCHF	Crimean-Congo Haemorrhagic Fever
CDC	Centres for Disease Control and Prevention
CBS	Community-Based Surveillance
CBIS	Community-Based Information System
CDC	Centers for Disease Control and Prevention
CEBS	Community Event-Based Surveillance
CFR	Case Fatality Rate
CHW	Community Health Worker
CIF	Case Investigation Form
CMS	Central Medical Stores
CSF	Cerebrospinal Fluid
DHIS2	District Health Information System Version 2
DCC	District Coordinating Committee
DF	Dengue Fever
DHF	Dengue Haemorrhagic Fever
DM	Diabetes Mellitus
DOTS	Directly Observed Therapy, Short-course
DPC	Disease Prevention and Control
DRM	Disaster Risk Management
DSO	District Surveillance Officer
DSS	Dengue Shock Syndrome
EBS	Event-Based Surveillance
eDEWS	Electronic Disease Early Warning System
EDPLN	WHO Emerging and Dangerous Pathogen Laboratory Network
eIDSR	Electronic Integrated Disease Surveillance and Response
ELISA	Enzyme-Linked Immunosorbent Assay
EOC	Emergency Operations Centre
EPI	Expanded Program on Immunization
EPR	Emergency Preparedness and Response
ES	Environmental Surveillance
EUL	Emergency Use Listing
EVD	Ebola Virus Disease
EWAR	Early Warning Alert and Response
GHSA	Global Health Security Agenda
GLASS	Global Antimicrobial Resistance Surveillance System
GWD	Guinea Worm Disease
HA	Hazard Analysis
HCF	Health Care Facility
HEBS	Health Facility Event-Based Surveilance

HF	Health Facility
HIS	Health Information System
HIV	Human Immunodeficiency Virus
HPO	Health Promotion Officer
IBS	Indicator Based Surveillance
ICC	Interagency Coordination Committee
ICSR	Individual Case Safety Report
IDSR	Integrated Disease Surveillance and Response
IEC	Information, Education and Communication
IFA	Immunofluorescence Assay
IHC	Immunohistochemistry
IHR (2005)	International Health Regulations (2005)
IHR MEF	IHR Monitoring and Evaluation Framework
ILI	Influenza-like Illness
IMCI	Integrated Management of Childhood Illness
IMNC	Integrated Management of Neonatal and Childhood Illness
IMS	Incident Management System
IMST	Incident Management System Team
INFOSAN	International Food Safety Authorities Network
IOM	Organization for Migration
IPC	Infection Prevention and Control
IRS	Indoor Residual Spraying
ITN	Insecticide-Treated Nets
JEE	Joint External Evaluation
MAWLR	Ministry of Agriculture, Water and Land Reform
MCH	Maternal Child Health
MDA	Mass Drug Administration
MDR	Multi-Drug Resistance
MDR	Maternal Death Review
MDR-TB	Multi-Drug Resistant Tuberculosis
MEF	Monitoring and Evaluation Framework
MoHSS	Ministry of Health and Social Services
MPDSR	Maternal and Perinatal Death Surveillance and Response
MSF	Médecins Sans Frontières
MTI	Medical Teams International
MUAC	Mid-Upper Arm Circumference
NAPHS	National Action Plan for Health Security
NNC	Neurocysticercosis
NFP	National Focal Point
NGO	Non-Governmental Organization
NICD	National Institute for Communicable Diseases
NIP	Namibia Institute of Pathology
NNT	Neonatal Tetanus
NTD	Neglected Tropical Disease
nOPV2	Novel Oral Poliovirus Vacciine Type 2
NRCS	Namibia Red Cross Scociety
OPV	Oral Poliovirus Vaccine
ORS	Oral Rehydration Salts
PBM	Paediatric Bacterial Meningitis
PCR	Polymerase Chain Reaction

PDR	Pan-Drug Resistance
PHC	Primary Health Care
PHE	Public Health Events
PHEIC	Public Health Emergency of International Concern
PHEMC	Public Health Emergency Management Committee
PHEOC	Public Health Emergencies Operations Centre
PHS	Public Health Surveillance
PoC	Point-of-Care
PoE	Points of Entry
PPE	Personal Protective Equipment
RDT	Rapid Diagnostic Test
RCCE	Risk Communication and Community Engagement
RNA	Ribonucleic Acid
RRT	Rapid Response Team
RTA	Road Traffic Accident
RVF	Rift Valley Fever
SADC	Southern Africa Development Community
SAR	Severe Acute Respiratory Infection
SARS	Severe Acute Respiratory Syndrome
SCDs	Standard Case Definitions
SFP	Surveillance Focal Point
SIA	Supplementary Immunization Activities
SIMEX	Simulation Exercise
SITREP	Situation Report
STIs	Sexually Transmitted Infections
SOPs	Standard Operating Procedures
TB	Tuberculosis
UNICEF	United Nations Children's Emergency Fund
USAID	United States Agency for International Development
VDPV	Vaccine-Derived Polio Virus
VHF	Viral Haemorrhagic Fever
VPDs	Vaccine Preventable Diseases
WHA	World Health Assembly
WHO	World Health Organization
WHO CC	WHO Central Command
WHO GLASS	Global Antimicrobial Resistance and Use Surveillance System
WHO-Namibia	WHO Country Office in Namibia
WHO-AFRO	WHO AFRICA Regional Office
WPV	Wild Polio Vaccine
WOAH	World Organisation for Animal Health
XDR	Extensively Drug-Resistant
XDR-TB	Extensively Drug Resistant Tuberculosis
YF	Yellow Fever

GLOSSARY (DEFINITION OF KEY TERMS)

Acute

Any disease having a rapid (sudden) onset and following a short course.

Agent

A factor, such as a microorganism, chemical substance, or form of radiation, whose presence, excessive presence, or (in deficiency diseases) relative absence is essential for the occurrence of a disease.

Age-specific mortality rate

A mortality rate limited to a particular age group. The numerator is the number of deaths in that age group; the denominator is the number of persons in that age group, in the population.

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.

Attack rate

A variant of an incident rate, applied to a narrowly defined population observed for a limited period of time, such as during an epidemic.

Bar chart

A visual display of the size of the different categories of a variable. Each category or value of the variable is represented by a bar.

Carrier

A person or animal without apparent disease who harbors a specific infectious agent and is capable of transmitting the agent to others. The carrier state may occur in an individual with an infection that is inapparent throughout its course (known as asymptomatic carrier), or during the incubation period, convalescence, and postconvalescence of an individual with a clinically recognizable disease. The carrier state may be of short or long duration (transient carrier or chronic carrier).

Case

In epidemiology, a countable instance in the population or study group of a particular disease, health disorder, or condition under investigation. Sometimes, an individual with the particular disease.

Case definition

A set of standard criteria for deciding whether a person has a particular disease or health-related condition, by specifying clinical criteria and limitations on time, place, and person.

Case-fatality rate

The proportion of persons with a particular condition (cases) who die from that condition. The denominator is the number of incident cases; the numerator is the number of cause-specific deaths among those cases.

Chronic

Any health condition that develops slowly or 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.

Demographic information

The "person' characteristics: age, sex, race, and occupation - of descriptive epidemiology used to characterize the populations at risk.

Denominator

The lower portion of a fraction used to calculate a rate or ratio. In a rate, the denominator is usually the population (or population experience, as in person-years, etc.) at risk.

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.

Distribution

In epidemiology, the frequency and pattern of health-related characteristics and events in a population. In statistics, the observed or theoretical frequency of values of a variable.

Elimination

Reduction to zero (or a very low defined target rate) of new cases in a defined geographical area.

Endemic

The constant presence of a disease or infectious agent within a given geographic area or population group; may also refer to the usual prevalence of a given disease within such area or group.

Epidemic

The occurrence of more cases of disease than expected in a given area or among a specific group of people over a particular period of time.

Epidemic curve

A histogram that shows the course of a disease outbreak or epidemic by plotting the number of cases by time of onset.

Epidemic period

A time period when the number of cases of disease reported is greater than expected

Epidemiological link

When a patient has, or has had exposure to a probable or confirmed case.

Epidemiology

The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the control of health problems.

Eradication

The purposeful reduction of specific disease prevalence to the point of continued absence of transmission in the world.

Etiology

Refers to the cause, set of causes, or origin of a disease or condition.

Evaluation

A process that attempts to determine as systematically and objectively as possible the relevance, effectiveness, and impact of activities in the light of their objectives.

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 reference to Public Health Events of International Concern, (PHEIC). An emergency incident or occurrence.
An event may be insignificant or it 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
NOTE: 'Event' and 'incident' are often used interchangeably.

Exposed (group)

A group whose members have been exposed to a supposed cause of disease or health state of interest, or possess a characteristic that is a determinant of the health outcome of interest.

Frequency distribution

A complete summary of the frequencies of the values or categories of a variable; often displayed in a two column table: the left column lists the individual values or categories, the right column indicates the number of observations in each category.

Health

A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.

Health indicator

A measure that reflects, or indicates, the state of health of persons in a defined population, e.g., the infant mortality rate.

Health Management Information System (HMIS)

A monthly reporting system for diseases, conditions, and risks that is reported to the MOHSS from every healthcare facility electronically or on paper.

High-risk group

A group in the community with an elevated risk of disease.

Histogram

A graphic representation of the frequency distribution of a continuous variable. Rectangles are drawn in such a way that their bases lie on a linear scale representing different intervals, and their heights are proportional to the frequencies of the values within each of the intervals.

Host

A person or other living organism that can be infected by an infectious agent under natural conditions.

Human-animal-environment interface

A continuum of contacts and interactions among people, animals, their products, and their environment(s); in some cases, facilitating transmission of zoonotic pathogens or shared health threats.

Hypothesis

A supposition, arrived at from observation or reflection, that leads to refutable predictions. Any conjecture cast in a form that will allow it to be tested and refuted.

Hypothesis, null

The first step in testing for statistical significance in which it is assumed that the exposure is not related to disease.

Immunity, active

Resistance developed in response to stimulus by an antigen (infecting agent or vaccine) and usually characterized by the presence of antibody produced by the host.

Immunity, herd

The resistance of a group to invasion and spread of an infectious agent, based on the resistance to infection of a high proportion of individual members of the group. The resistance is a product of the number susceptible and the probability that those who are susceptible will come into contact with an infected person.

Immunity, passive

Immunity conferred by an antibody produced in another host and acquired naturally by an infant from its mother or artificially by administration of an antibody containing preparation (antiserum or immune globulin).

Incidence rate

Commonly just referred to as incidence. A measure of the frequency with which an event, such as a new case of illness, occurs in a population over a period of time. The denominator is the population at risk; the numerator is the number of new cases occurring during a given time period.

Incidence rate = Frequency of emergence of new cases or events in a population over a given period. x 10n
Total population exposed to risk over the same period.

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 (e.g. within a clearly delineated site or sites) or dispersed (e.g. a widespread power outage or an epidemic). Incidents may start suddenly (e.g., a chemical plant explosion) or gradually (e.g., a drought). They may be of very short duration (e.g. 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 standardized approach to emergency management encompassing personnel, facilities, equipment, procedures, and communications operating within a common organizational structure.
The IMS Standardized processes allow all who respond to the same incident to formulate a unified plan, to manage the incident.

Incubation period

A period of sub clinical or in apparent pathologic changes following exposure, ending with the onset of symptoms of infectious disease.

Indirect transmission

The transmission of an agent carried from a reservoir to a susceptible host by suspended air particles or by animate (vector) or inanimate (vehicle) intermediaries.

Infant mortality rate

A ratio expressing the number of deaths among children under one year of age reported during a given time period divided by the number of births reported during the same time period. The infant mortality rate is usually expressed per 1,000 live births.

Infectivity

The proportion of persons exposed to a causative agent who become infected by an infectious disease.

International Health Regulations (IHR)2005)

International legal instrument that is binding in 196 countries. The regulations aim to help the international community.

Latency period

A period of sub clinical or inapparent pathologic changes following exposure, ending with the onset of symptoms of chronic disease.

Mean

The measure of central location commonly called the average. It is calculated by adding together all the individual values in a group of measurements and dividing by the number of values in the group.

Median

The measure of central location, which divides a set of data into two equal parts.

Mode

A measure of central location, the most frequently occurring value in a set of observations.

Morbidity

Any departure, subjective or objective, from a state of physiological or psychological well-being.

Mortality rate

A measure of the frequency of occurrence of death in a defined population during a specified interval of time.

Multisectoral

Participation of more than one sector working together on a joint program or response to an event (e.g., a joint investigation by public health and law enforcement).

Natural history of disease

The temporal course of disease from onset (inception) to resolution.

Neonatal mortality rate

A ratio expressing the number of deaths among children from birth up to but not including 28 days of age divided by the number of live births reported during the same time period. The neonatal mortality rate is usually expressed per 1,000 live births.

Normal curve

A bell-shaped curve that results when a normal distribution is graphed.

Normal distribution

The symmetrical clustering of values around a central location. The properties of a normal distribution include the following: (1) It is a continuous, symmetrical distribution; both tails extend to infinity; (2) the arithmetic mean, mode, and median are identical; and, (3) its shape is completely determined by the mean and standard deviation.

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 than expected in a defined geographic area or time.

Pandemic

An epidemic occurring worldwide, or over a very wide area, crossing international borders and usually affecting a large number of people.

Period prevalence

The amount a particular disease present in a population over a period of time.

Pie chart

A circular chart in which the size of each "slice" is proportional to the frequency of each category of a variable.

Point prevalence

The amount of a particular disease present in a population at a single point in time.

Points of Entry (PoE)

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.

Population

The total number of inhabitants of a given area or country. In sampling, the population may refer to the units from which the sample is drawn, not necessarily the total population of people.

Postneonatal mortality rate

A ratio expressing the number of deaths among children from 28 days up to but not including 1 year of age during a given time period divided by the number of lives births reported during the same time period. The postneonatal mortality rate is usually expressed per 1,000 live births.

Prevalence

The number or proportion of cases or events or conditions in a given population.

Prevalence rate

The proportion of persons in a population who have a particular disease or attribute at a specified point in time or over a specified period of time.

Propagated outbreak

An outbreak that does not have a common source, but instead spreads from person to person.

Proportion

A type of ratio in which the numerator is included in the denominator. The ratio of a part to the whole, expressed as a "decimal fraction" (e.g., 0.2), as a fraction (1/5), or, loosely, as a percentage (20%).

Public health surveillance

The systematic collection, analysis, interpretation, and dissemination of health data on an ongoing basis, to gain knowledge of the pattern of disease occurrence and potential in a community, in order to control and prevent disease in the community.

Rate

An expression of the frequency with which an event occurs in a defined population.

Rate ratio

A comparison of two groups in terms of incidence rates, person-time rates, or mortality rates.

Ratio

The value obtained by dividing one quantity by another.

Relative risk

A comparison of the risk of some health-related event such as disease or death in two groups.

Reporting site

A site which reports about surveillance and outbreak data to the district level. A reporting site includes all health facilities (public, private and quasi-governmental, faith-based), standalone laboratories, and PoE. A reporting site also contains event reports from community surveillance and response.

Representative sample

A sample whose characteristics correspond to those of the original population or reference population.

Reservoir

The habitat in which an infectious agent normally lives, grows and multiplies; reservoirs include human reservoirs, animals reservoirs, and environmental reservoirs.

Risk

The probability that an event will occur, e.g. that an individual will become ill or die within a stated period of time or age.

Seasonality

Change in physiological status or in disease occurrence that conforms to a regular seasonal pattern.

Secondary attack rate

A measure of the frequency of new cases of a disease among the contacts of known cases.

Sentinel surveillance

A surveillance system in which a pre-arranged sample of reporting sources agrees to report all cases of one or more notifiable conditions.

Sex-specific mortality rate

A mortality rate among either males or females.

Sporadic

A disease that occurs infrequently and irregularly.

Spot map

A map that indicates the location of each case of a rare disease or outbreak by a place that is potentially relevant to the health event being investigated, such as where each case lived or worked.

Transmission of infection

Any mode or mechanism by which an infectious agent is spread through the environment or to another person.

Vector

An animate intermediary in the indirect transmission of an agent that carries the agent from a reservoir to a susceptible host.

Vehicle

An inanimate intermediary in the indirect transmission of an agent that carries the agent from a reservoir to a susceptible host.

Vital statistics

Systematically tabulated information about births, marriages, divorces, and deaths, based on registration of these vital events.

Zoonotic disease or zoonosis

An infectious disease that can be shared between animals and people.

NATIONAL TECHNICAL GUIDELINES FOR INTEGRATED DISEASE SURVEILLANCE AND RESPONSE

PART 

Introduction

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1.1 Introduction to IDSR

This section introduces the concept of IDSR, which incorporates indicator-based-, and event-based surveillance as integral parts of an Early Warning Alert and Response (EWAR) system. The section also provides guidance on how IDSR works, the objectives of IDSR, and how IDSR can help to build and sustain the International Health Regulation (IHR) (IHR (2005)) core capacities, thereby facilitating the implementation of IHR. Furthermore, this section introduces other aspects such as:

- the One Health approach;
- the linkage between Disaster Risk Management (DRM) and IDSR;
- core surveillance functions;
- the use of these guidelines atsub-national level (eg., districts) to strengthen surveillance and response;
- the roles and responsibilities of the various actors at different levels; and finally,
- the priority diseases, conditions and events recommended in IDSR.

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

1.2 Public Health Surveillance (PHS)

Public Health Surveillance is the ongoing systematic identification, collection, collation, analysis, and interpretation of disease occurrence and public health event data in order to take timely and robust action. It includes the timeous dissemination of the resulting information to those who need to know, for effective and appropriate action. Surveillance is also essential for planning, implementation, monitoring and evaluation of public health practice. The Ministry of Health and Social Services (MoHSS) has decided to achieve its PHS objectives through the implementation of IDSR strategy.

1.2.1 Definition of the different types/approaches of PHS

a) Passive surveillance: a system by which a health institution receives routine reports submitted from health facilities (hospitals, health centres and clinics, community and other sources). There is no active search for cases. This is the most common system, and it includes the surveillance of diseases and other public health events using routine surveillance; routine Health Management and Information System (HMIS) or any other public health information system.

b) Active surveillance: involves an ongoing search for cases in the community or health facilities. This may involve regular contact with key reporting sources, e.g., telephone calls to healthcare workers at a facility or laboratory or physically moving to the source and reviewing records of data. Examples include the active search for cases of Measles and Polio, as well as during outbreaks when mechanisms must be instituted for active finding of additional cases.

c) Integrated Disease Surveillance: is an approach that aims at collecting health data for multiple diseases using standardized 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, namely:

1. Indicator-Based Surveillance (IBS), and
2. Event-Based Surveillance (EBS).

1.2.1.1 Indicator-Based Surveillance (IBS)

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

a) What are the common methods of indicator-based surveillance?

Facility-based surveillance

All reporting units (e.g., health facilities) are required to report on a weekly, monthly, quarterly or annual basis to the next level, based on the category of the diseases, conditions and events. Additionally, they are also required to immediately report to the next level, any epidemic-prone disease.

Case based surveillance

Case-based surveillance involves the ongoing and rapid identification of identifiable cases for the purpose of case follow-up. It is the type of surveillance used for diseases that are targeted for elimination or eradication, or during confirmed outbreaks. In these scenarios, every individual case identified is immediately reported to the next level, using a case-based form.

Sentinel surveillance

This type of surveillance is done for specific conditions in a specific cohort such as a geographical area or population subgroup, to estimate trends in a larger population. A given number of health facilities or reporting sites are usually designated as sentinel sites for monitoring the rate of occurrence of priority events such as pandemic or epidemic events, and other PHEs of public health importance. They also act as early warning and reporting sites. Sentinel sites are usually designated because they are representative of an area, or are in an area of likely risk for a disease or condition of concern. Examples of sentinel surveillance includes sentinel surveillance for Influenza, Rotavirus, Paediatric Bacterial Meningitis (PBM) and environmental sewage sampling for Polio.

Syndromic surveillance

is an active or passive system that uses Standard Case Definitions (SCD) based entirely on clinical features without any laboratory diagnosis. For example, collecting the number of cases of Acute Flaccid Paralysis (AFP) as an alert for Polio; or acute watery diarrhoea among people aged two years and older as an alert for Cholera; or “rash illness” as an alert for Measles; or Acute Haemorrhagic Fever (AHF) as an alert for viral haemorrhagic diseases, or severe acute respiratory infection (SARI) or influenza-like illness (ILI) as alerts for influenza. Because of the lack of specificity of this system, reports require more investigation from higher levels.

Laboratory-based surveillance

consists of surveillance conducted at laboratories for detecting events or trends that may not be seen as a problem at other locations, or which originate from routine laboratory testing,or when conducting sentinel surveillance. Laboratories can be the source of an initial alert for a specific outbreak or public health event that necessitates further epidemiological investigation. For example, a laboratory may be the first to detect the emergence of resistant strains in the community, such as Multi-Drug Resistant Tuberculosis (MDR-TB). Other examples of laboratory-based surveillance include virological alerts (e.g., influenza surveillance) and bacteriological alerts, such as Antimicrobial Resistance. WHO has recently established a Global Antimicrobial Resistance Surveillance System (GLASS), which is a surveillance system for clinical specimens and is focused initially on priority human bacterial infections namely *E. coli*, *K. pneumonia*, *S. aureus*, *S. pneumoniae*, Salmonella species, Shigella species and *N. gonorrheae*. This type of laboratory surveillance provides information about antimicrobial resistance incidence, prevalence, and trends.

Disease-specific surveillance
involves surveillance activities aimed at targeted health data for a specific disease, for further vertical surveillance. Examples include Tuberculosis (TB), Malaria and Human Immunodeficiency Virus (HIV) surveillance systems.

Community-Based Surveillance (CBS)
is defined as the systematic detection and reporting of events of PHS within communities, by community members. CBS incorporates both indicator-based-, and event-based surveillance methods. CBS involves identified focal person(s) (FPs) who report cases or events to the designated focal point at the nearby health facility. Community-based surveillance strategies focus on two approaches to collect community information. The first relies on identifying and reporting events based on agreed indicators (lay case definitions). For example, trusted community members are trained to identify diseases such as Measles, Cholera, Polio and Haemorrhagic Fever using community (lay) case definitions, and to use standardized reporting systems to the next level. The second strategy relies on reporting of unusual events (alerts) which can alert for early stages of an outbreak, or any other public health threat in the community. Alerts may capture a wide variety of unusual events emerging at the community level and information from these alerts may be incomplete and unconfirmed. As such, they all need to be triaged and verified. Information can also come from people who have already been oriented on the agreed indicators (lay case definitions) for example Community Health Workers (CHWs), or any other representatives from the community who have been oriented to detect events like unusual animal deaths, and report these to the next level. CHWs often link the patient, identified through any of the strategies, to a nearby health facility and can help identify contacts.

1.2.1.2 Event-Based Surveillance (EBS)

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

Alerts which may signify potential risks may include:

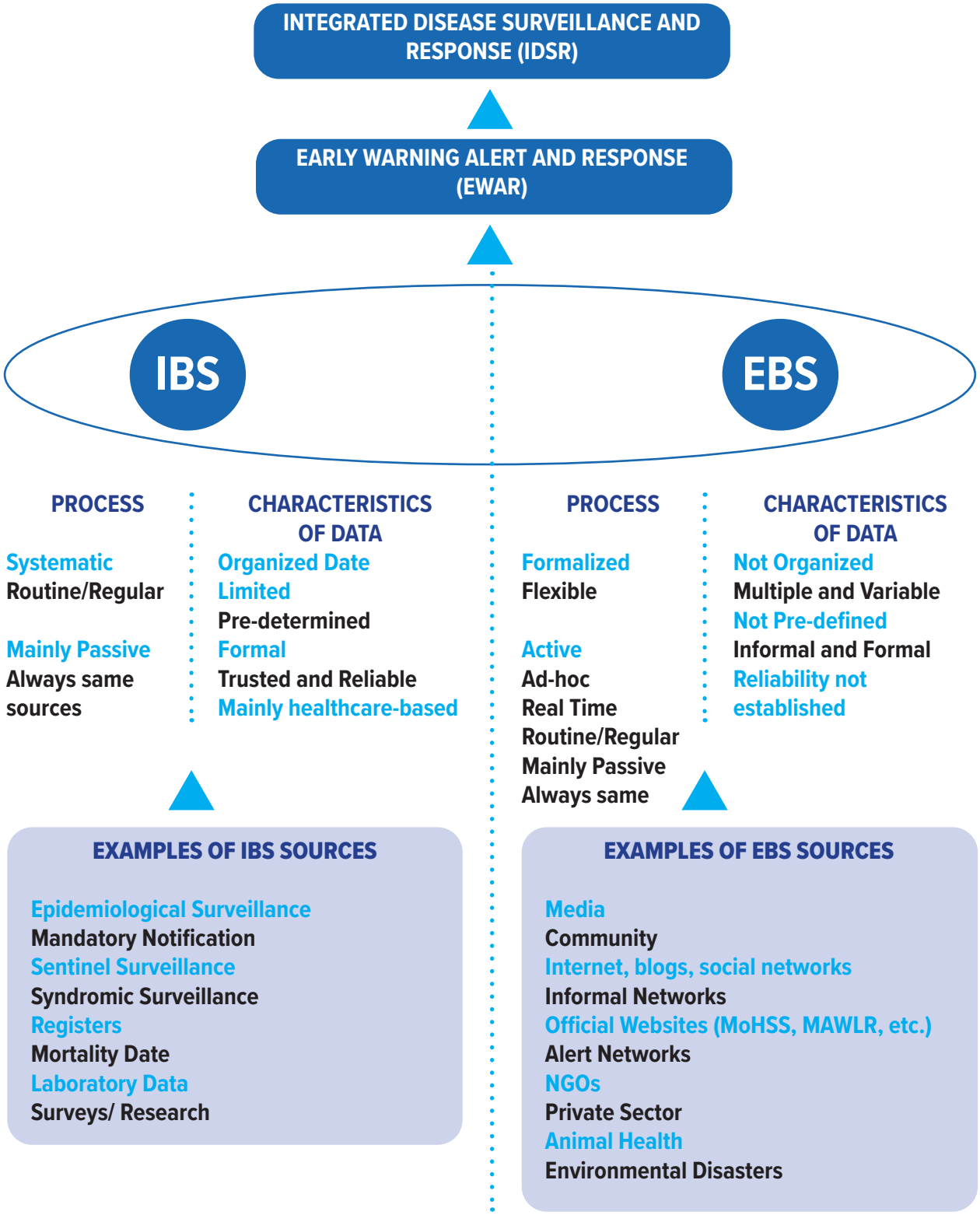
- Occurrence of disease in humans, such as unexplained clustered cases of a disease or syndromes, or unusual disease patterns, or unexpected deaths as recognized by health workers and other key informants in the community;
- Events related to potential exposure for humans, such as events related to diseases and deaths in animals, contaminated food products or water, and environmental hazards including chemical and radio-nuclear events; and
- Alerts of potential exposure of human beings by biological, chemical or radiological and nuclear hazards, or occurrence of natural or man-made disasters.

Event-based surveillance also involves media monitoring, which entails the regular scanning of newspapers, internet sites and media alert systems, for example hot lines, blogs, social media, radios, and television. The EBS system is very sensitive, therefore information received through this system should be synchronized with IBS and rapidly assessed for the risk the event poses to public health, and responded to appropriately.

NOTE: Unlike indicator-based surveillance, EBS 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, unusual or clustering of cases, events/conditions in the community, including environmental conditions).

Figure 1 below illustrates how EBS and IBS are organised within a functional health system.

Figure 1: Indicator-based-, and event-based surveillance for Early Warning Alert and Response (EWAR) for IDSR Strategy

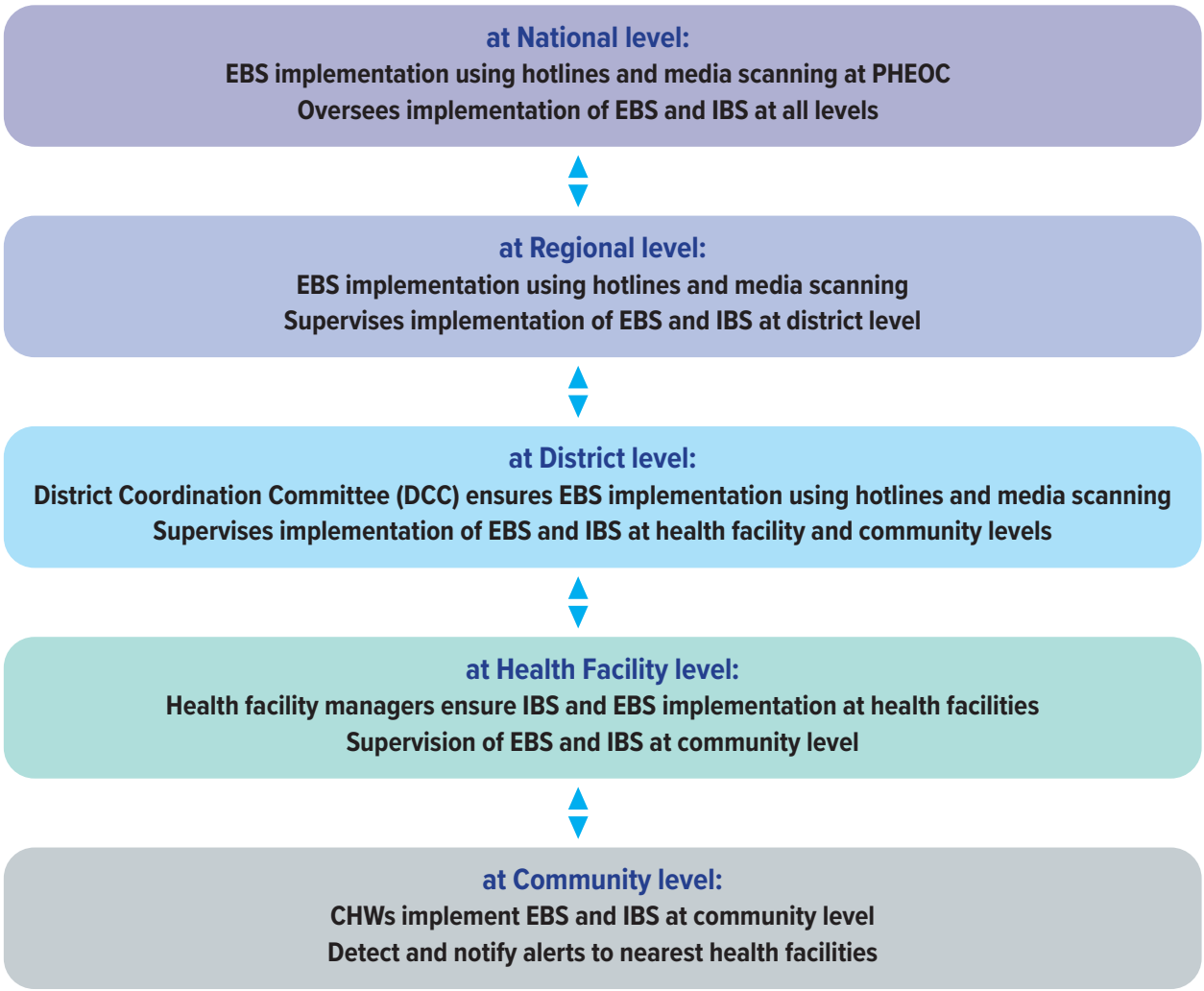


NOTE: Intersection of IBS and EBS: All events detected in the EBS system that are investigated and meet the Standard Case Definition (SCD), should be captured in the IBS system and reported to the next level of the health care system.

1.2.2 EBS and IBS as backbone to the IDSR Strategy

EBS and IBS are components of EWAR and epidemic intelligence, incorporated in the IDSR strategy. Both EBS and IBS are complimentary, with each having a different purpose and role to play. EBS is most likely to pick up alerts for early detection of small outbreaks, while IBS is more efficient in monitoring disease trends over time. It is also useful for signalling the start of regular seasonal outbreaks of endemic diseases using alert and epidemic thresholds. IBS may not be useful for smaller events because alerts 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 i.e., from community to health facility, district to region and region to national level. EBS and IBS are applied at all levels of the health system, namely community, health facility, district, regional and national levels (Illustrated in Figure 2 below).

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



NOTE: IBS and EBS are complementary sources of information, and both contribute to the early warning function that is 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.

1.3 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 best approach for improving public health surveillance and response for priority diseases, conditions and events at community, health facility, district, regional and national level. Namibia adopted the IDSR strategy to promote rational and efficient use of resources by integrating and streamlining common surveillance activities and functions. The IDSR strategy makes surveillance and laboratory data more usable. It enables public health managers and decision-makers to improve detection and response to the leading causes of illness, death and disability in African countries. As part of the improvement of the healthcare system, IDSR strategy also assists countries to better monitor and track planned targets, and ensure that they are achieved in a timely manner.

Surveillance activities for different diseases involve similar functions (detection, sample collection, reporting, analysis and interpretation, feedback, 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. In the case of eradication, time-limited intensive efforts aimed at proving the absence of disease may be required.

What takes place in an integrated system?

- 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.

- 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) also often address surveillance for Neonatal Tetanus, Measles and other Vaccine Preventable Diseases (VPDs), or any unusual events. Health workers who routinely visit health facilities to search for AFP cases will also review district and health facility records for information about other priority diseases in the area. CHWs interact with their community members on a regular basis and ask about a range of diseases, conditions and events. Communities know they can bring anything unusual to the attention of their focal persons.

- The district is the primary level in the health system and the hub and focus for integrating surveillance functions with dedicated staff in public health. They are responsible for implementation of the MoHSS Strategic Plan, monitoring of health events in the health facility, community and mobilizing community action. The district can also request for national assistance and access regional resources to mitigate the impact on the district's health system. Similar functions also occur at the various administrative levels.

- Surveillance focal persons at the district, regional 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.

- The focus is on the creation of an overall public health surveillance system with adequate 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 of potential outbreaks and response interventions in a timely manner. Information flow should also consider adjoining communities and districts.

Integration refers to the efficient use of human resources, harmonization of different methods, software, data collection forms, standards and case definitions in order to prevent inconsistent information, and to maximize efforts among all disease prevention and control programmes as well as stakeholders. Districts should use the standard reporting forms - a single data entry system for multiple diseases, and common communication channels. Training and supervision are integrated, a common feedback bulletin is used, and other resources such as computers and vehicles are shared. IDSR involves full-time coordination of surveillance activities and joint action (planning, implementation, monitoring and evaluation), whenever it is possible and useful.

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

1.3.1 Objectives of Integrated Disease Surveillance and Response

Main Objective: To improve the country's ability to detect, report, confirm, and effectively respond to high-priority communicable and non-communicable diseases. The specific objectives of IDSR are to:

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

b. Increase involvement of clinicians and other cadres of health workers in the surveillance activities.

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

d. Improve triangulation and use of information to detect changes in trends, 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 to facilitate evidence-based responses to public health events; health policy design; planning; and management.

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

f. Build strong laboratory systems and networks at national, regional and district levels to confirm pathogens and other hazards, monitor drug sensitivity and increase efficacy of point-of-care tests (PoC tests).

g. Trigger epidemiological investigations of reported public health problems and the implementation of effective public health interventions.

h. Mount an effective response to public health emergencies.

i. Emphasize community participation in the detection, reporting and response to public health problems, including case-based-, and event-based surveillance, response and risk communication in line with the IHR (2005).

1.4 IDSR and IHR (2005)

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

1.4.1 IHR (2005) purpose and goal

The purpose of the IHR (2005) is to prevent, protect against, control and provide public health responses 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.

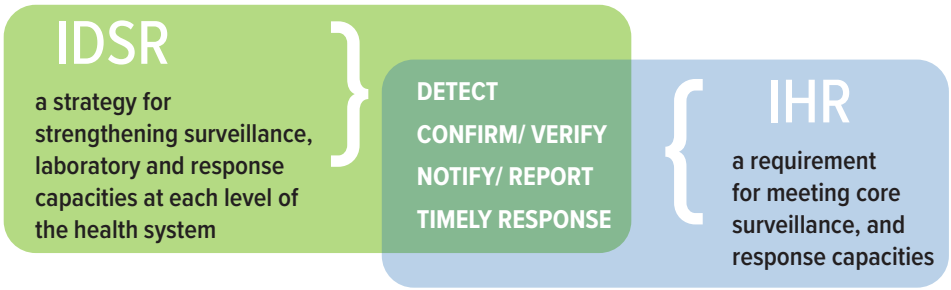
The scope of IHR (2005) has been expanded from the three initial diseases - Cholera, Plague and Yellow Fever - to include all Public Health Emergencies of International Concern (PHEIC). This includes emergencies caused by infectious diseases, chemical agents, radioactive materials and contaminated food. Since the goal of IDSR is to strengthen the overall national system for the surveillance of diseases, particularly at the district level, and aims to ensure a continuous and timely provision and use of information for public health decision making, IDSR provides for the implementation of the IHR (2005) in the following ways:

- Infrastructure for surveillance, investigation, confirmation, reporting and response;
- Skilled human resources;
- Defined implementation process (sensitization, assessment, plan of action, implementation, monitoring and evaluation); and
- Generic guides for assessment; plan of action development; technical guidelines; training materials; tools and Standard Operating Procedures (SOPs) that incorporate IHR (2005) components.

African Member States have recommended that IHR (2005) be implemented in the context of IDSR.

The IHR (2005) requires countries to put in place a *"sensitive, reliable and flexible surveillance system that meets international standards."* The IDSR has that potential as it ensures a reliable supply of information to the national level, in order to fulfil the requirements of the IHR (2005). The IHR (2005) provides an opportunity to address the threat to international public health security and trade caused by emerging and re-emerging infectious diseases, including PHEIC. Moreover, IHR (2005) also provides an excellent opportunity to strengthen surveillance and response systems, and to act as a potent driver for IDSR implementation. 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]



[1]*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 A of the regulations. February 2009*

The IHR (2005) guidelines have practical implications for IDSR. In the IHR (2005) guideline, all PHEIC should be detected, assessed and responded to timeously, using an adapted response rather than pre-set measures. The IHR (2005) guidelines include the measures to be taken at PoE (airports, ports and ground crossings), and containment at source of public health events. The IHR (2005) guidelines also include the capturing of rumours 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.

1.4.2 Monitoring and evaluating the functional core capacity for implementation of IHR (2005)

Following the Ebola outbreak experience in 2015, several IHR review committees and various expert panels recommended that, in addition to annual monitoring of IHR, there is a need for additional tools to be used to monitor and evaluate IHR (2005) implementation. As a result, WHO member states and partners have adopted the combined approach of the IHR (2005) monitoring and evaluation process since 2016.

The four components of the IHR (2005) Monitoring and Evaluation Framework (MEF) include:

1. Mandatory annual reporting to the World Health Assembly (WHA);
2. Joint External Evaluation (JEE);
3. After Action Review (AAR); and
4. Simulation Exercises (SIMEX).

These four components highlight a more functional approach to assessing IHR (2005) capacities, and foster transparency and mutual accountability. This is illustrated in Figure 4 below.

Figure 4: Principles of a new IHR Monitoring and Evaluation Framework (IHR MEF)

1.5 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 both people, animals and the environment. The One Health approach applies to the local, regional, national, and global levels. Humans and animals (domestic and wildlife) share the same ecosystem, and the opportunities for spillover of diseases are increasing with modern trends in globalization, growing population pressures, climate change, economic development, mass urbanization, and the increasing demand for animal-sourced foods.

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. The One Health approach aims to improve indicator- and event-based surveillance, which is the cornerstone for the early warning function of the IDSR. Animal, human and environmental health workers as well as other relevant partners should be engaged at various levels to act as information sources for IDSR, and to further facilitate information sharing and joint rapid response activities. The One Health approach offers a comprehensive framework for IHR (2005) implementation, helping to address PHEIC from all sources. The key principles of the One Health approach include prevention and control of emerging infectious diseases (with reference to internationally adopted standards i.e., IHR (2005) and the World Organisation for Animal Health (WOAH) (formerly the Office International des Epizooties (OIE)) international standards, as well as support for national public health services, and building on the existing structures.

The One Health approach also considers the role of changing environments with regard to infectious and chronic disease risks affecting humans and animals. By utilizing data, expertise and management approaches in the environment, environmental health practitioners can assist in enhancing the understanding of the root causes of diseases, and better account for the complexity of environmental factors.

A strong functional IDSR thus requires improved communication, coordination and collaboration from all sectors, for the implementation of an effective One Health framework.

1.6 IDSR and Disaster Risk Management (DRM)

During the 62nd WHO Regional Committee Meeting in November 2012, Namibia, as a member state adopted the Disaster Risk Management (DRM) strategy which aims to comprehensively address DRM in the African Region health sector.

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 in order to lessen the adverse impact of hazards and the possibility of disaster. DRM is driven by firstly conducting a Hazard Analysis (HA), followed by an assessment on the level of vulnerability and available coping capacity. The ultimate objective of DRM is the reduction of risk, by reducing vulnerability or improving the capacity to mitigate the impacts 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 the identification of hazards, assessment, risk communication and monitoring of disaster risks, and hence enhances the early warning component.

1.7 Implementing cross border activities in the context of IDSR

The free movement of people and goods across borders within the region, provides ample opportunities for the cross-border spread of diseases. Given the ecological distribution of communicable diseases and the porosity of international borders, it is imperative that countries in the region work together to control and contain them. In addition, in the urban

centres 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 districts and regions engage each other in coordinated and synchronized implementation of interventions so as to prevent and control any communicable diseases. Developing a cross-border framework therefore provides an ideal opportunity for countries to initiate and strengthen 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 to the IHR (2005).

- In collaboration with WHO, countries should establish cross-border surveillance and response frameworks with neighbouring countries using the existing IDSR systems in their respective countries.
- Countries should establish procedures for data sharing within the framework of IDSR.
- When outbreaks are detected through the IDSR system, the neighbouring cross-border areas and districts should be notified using the reporting tools of IDSR. If they are reporting a similar outbreak, they should coordinate response efforts with the IDSR response structures as described in Sections 4, 5 and 6 of this 3rd edition of the IDSR Technical Guidelines.
- Ensure cross-border (district-district) coordination and collaboration on surveillance issues and provide notification of any outbreaks in the neighbouring district. International or cross-border notification should also be done if necessary.
- Develop and organize simulation exercises with cross-border district teams.
- Organize regular cross-border meetings.
- Political leaders should assist districts to facilitate cross-border district surveillance and response initiatives.

1.8 Electronic IDSR (eIDSR) as a platform to enhance real time surveillance

The application of electronic tools (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 (eIDSR) provides new opportunities for acceleration of the achievement of the core capacities of the IHR (2005). It applies electronic tools to the principles of IDSR to facilitate prevention, prediction, detection, reporting and response.

It is based on the following:

- Standardised interoperable and interconnected information systems administered within the national context.
- Rapid collection, analysis, reporting and use of disease/events data in real-time for appropriate public health action.

While paper-based tools can also provide well-timed information, districts and regions should aim to have electronic tools to facilitate timeous transmission of data, to enable effective responses to public health threats.

The implementation of eIDSR should aim to:

a. Fulfil the regional committee recommendations on use of information technology, which is core in the achievement of IHR (2005) requirements;
b. Assist in standardization of data;
c. Assist in improvement of timeliness and completeness of reporting;
d. Assist in early detection, investigation, and response to outbreak or public health events;
e. Reduce manual data entry that is prone to errors;
f. Ensure systematic information sharing across levels and sectors;

g. Enable better data transmission andmanagement, including data storage and easy access;
h. Enhance virtual, near real-time disease monitoring capability;
i. Improved data quality; and
j. Reduced system costs and easily generated automated alerts.

1.9 Surveillance functions

These 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 eight core functions:

1. Identify and record cases, conditions and events:

Use of standard case definitions (SCDs) for health service delivery points (human, animal and environment), and simplified case definitions for community level, for the identification of priority diseases and conditions, and to further identify alerts that can signal emerging public health events. Additionally, case identification can also be done through other health service delivery points (animal and environment) using the formal health system, private health systems or community structures. Case definitions and a functioning alert and verification system are vital for detecting cases and outbreaks. After identification, all alerts including true events must be recorded in a recognized register, including the line list register.

2. Report:

Suspected cases, conditions or events must be reported to the next level for action. If this is identified as an epidemic-prone disease or a potential PHEIC, or a disease targeted for elimination or eradication, health workers should immediately investigate the case or event, collect the necessary diagnostic sample and submit a detailed report. For events to be notified under IHR to WHO, the National Focal Point (NFP) will use the Decision Instrument (Annex 2 of IHR) to identify any potential PHEIC.

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

Surveillance data should be compiled, analysed for trends, compared with data from previous periods, and interpreted for use in public health actions.

4. Investigate and confirm suspected cases, outbreak or event:

Case or outbreak confirmation involves the epidemiological investigation of suspected cases and the capacity of the laboratory to issue a confirmation. Health workers should ensure that the case and contacts, outbreak or event is investigated and is laboratory-confirmed. Capacity for case confirmation is enhanced through improved referral systems, networking and partnerships. Gathering evidence about what may have caused the outbreak or event, by including also non-human sources of information e.g., animals (domestic and wildlife), environment, etc. is used to select appropriate control and prevention strategies. Social, gender and behavioural factors at the site should also be collected, and used to tailor locally-appropriate responses and risk communication.

5. Prepare:

Preparedness refers to the availability of public health emergency preparedness and response plans, including stockpiling (vaccines, drugs and laboratory reagent), designation of isolation facilities, setting aside resources for outbreak response, and training of relevant personnel. In advance of occurrence of outbreaks or public health events, teams should be prepared and ready for a quick response, and essential supplies and equipment must be available for immediate action. Mechanisms for the coordination of a response should be in place even before an outbreak occurs. Ensuring that 'outbreak response contracts' and Memorandums of Understanding (MOUs) between United Nations (UN) agencies and Non-Governmental Organizations (NGOs)/civil society are already in place, means that logistical support can be sent to the lowest levels quickly for action. Historical data from human health and other relevant sectors (meteorological, animal, environment, etc.) can also be used to assess vulnerabilities and risks to the population. The risk analysis can also be conducted through prediction models.

6. Respond:

When an outbreak, acute public health event or condition is detected, an investigation should take place to determine the cause of the problem, identify gaps and vulnerabilities, coordinate and mobilize resources and personnel to implement the appropriate public health response. The results of the investigation should guide the response. If needed, at national level, a Public Health Emergencies Operations Centre (PHEOC) or a similar coordination mechanism should be activated under the leadership of a government official with decision-making authority. At the sub-national level a similar coordination mechanism should also be in place for appropriate response. A spokesperson should be identified and a risk communication plan put in place. A coordination platform for all stakeholders who are involved in communication should be set up. Meetings with local authorities, political and religious leaders, and community elders are necessary to ensure adequate community engagement for successful responses to health emergencies.

7. Risk communication:

Risk communication is an essential element for all surveillance systems, as well as for disaster and emergency preparedness and response. It is the real-time exchange of information, advice and opinions between experts, community leaders, or officials and the people who are at risk. Communicating with all levels about the investigation outcome and the success of response efforts, including the communities and individuals that provided data, reported outbreaks, cases and events ensures future cooperation. Reporting by communities should especially always be acknowledged as a vital component of future response.

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

The effectiveness of the surveillance and response systems needs to be assessed, in terms of timeliness, quality of information, preparedness, (thresholds, case management) and overall performance. Feedback to health workers reinforces their efforts to participate in the surveillance system. Problems should continuously be corrected and improvements made wherever possible. Different evaluation procedures can be used for this purpose, such as the Intra Action Review (IAR), After Action Review (AAR), Joint External Evaluation (JEE), Simulation Exercises (SIMEX), and operational review etc. Community representatives, private sector and NGOs should always be included in these evaluation activities.

1.9.1 Levels where surveillance activities are performed

The levels are defined as follows:

Community:
Represented by basic community-level services such as community resource persons, village or community leaders (religious, traditional or political) or school teachers, CHWs, locally identified community volunteers, veterinarians, and traditional healers.

Health facility:
For surveillance purposes, all institutions (public, private, NGOs, faith-based organizations (FBOs) and others) with outpatient and/or inpatient facilities are defined as a health facility.

Region and district level:
This is an intermediate level administrative unit generally serving a population of more than 10,000 people in one area.

National level:
This is the central level where policies are developed, and resources are allocated. In relation to surveillance, this level reports on priority diseases and uses the IHR decision instrument to report public health events of international concern to WHO.
See Section 2.

These guidelines focus on improving surveillance for all service delivery points (public and private). In an integrated system, some laboratory services are available at each level described above.
See Section 1 for a description of laboratory functions by level.

1.9.2 How districts can strengthen surveillance and response

Districts can use a matrix of IDSR functions and skills to describe their role in the surveillance system. This 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:

- Ensuring that all necessary functions and capacities have been identified;
- Establishing accountability to provide a basis for assigning functions to appropriate levels and determining what capacities should be present;
- Organizing activities and training for human resource development;
- Managing, monitoring and evaluating programs;
- Strengthening district laboratory capacity, including laboratory information systems; and
- Planning for resources (human, material/supplies and financial).

Moreover, the IDSR matrix also highlights several key assumptions that need to be in place for the core functions of the surveillance system to be effective. If one or more of the elements at each level is not present or is being performed poorly, the risk of failure increases for achieving surveillance and control objectives. An effective system will be supported at each level from the levels above and below. A complete system minimizes any delay in taking public health actions.

The functions of detection, reporting, analysis, investigation, response, risk communication, monitoring and evaluation and providing feedback are interdependent, and should always be linked. The IDSR matrix 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.

See Annex A at the end of this section.

1.10 Contents of the guidelines

These guidelines have been revised in order to incorporate lessons learnt from previous epidemics, new frameworks or strategies such as the regional strategy for health security and emergencies, the revised IHR MEF, initiatives for enhancing prevention, detection and response to public health events (Global Health Security Agenda (GHSA), One Health, DRM), key regional strategies and rising non-communicable disease threats and road traffic injuries. The revisions are made against the context of the need for continuous development of resilient health systems. The revised guidelines also aim to address how to implement the IHR (2005) requirements and capacities for surveillance and response. These guidelines are adapted to reflect national priorities, policies and public health structures, and should be used in conjunction with other similar guidelines/strategies or initiatives.

Overall, the revised guidelines incorporate the following:

i. Strengthened indicator-based surveillance with better analysis, reporting and use of routine data for decision making;
ii. Strengthened event-based surveillance;
iii. Improved community-based surveillance;
iv. Improved cross-border surveillance and response;
v. Scaled up e-IDSR implementation;
vi. Improved reporting and information sharing platforms;
vii. Improved data sharing between sectors; and
viii. IDSR tailored to emergency or fragile health system contexts.

The guidelines are intended for use as:

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

1.10.1 Key people and entities that will use this guideline

These guidelines are to be used by healthcare workers at both public and private Primary Health Care (PHC) levels because this level is usually where an illness is presented for the first time.

Additionally, these guidelines will be used by:

- Disease surveillance managers and officers at all levels
- IHR National Focal Points
- Port Health Officials

- Immigration Officers
- Hospital Managers, and Infection Control Officers
- National Laboratory Services
- Veterinary Officials
- Wildlife Health Officials
- Environmental Health Practitioners and Assistants
- District and Regional health management teams
- Public Health Staff
- Health Programme Officers
- Public Health Emergency Management Committees Members
- Medical Doctors
- Nurses
- Pharmacists
- Health Communications Officers
- Health Facility Managers
- Medical and Nursing Educators
- Other Health Educators
- General Communication Officers
- Logisticians
- Laboratory Personnel
- Community Leaders (traditional leader, religious leader, etc.)
- Councillors and District/Regional political officials (Local Authorities)
- Other public health experts and practitioners in specialised institutions
- Public Health Training Institutions
- Other health partners including NGOs
- Other line Ministries and Stakeholders.

1.11 Priority diseases, conditions and events included in the IDSR

As a priority for integrated disease surveillance in Namibia, the following communicable and non-communicable diseases (NCDs), conditions or events have been adopted.

These diseases or conditions are recommended because they are:

- ***Required internationally under IHR*** (Smallpox, Poliomyelitis due to Wild-Type Poliovirus, Human Influenza caused by a new subtype, and SARS);
- ***Diseases with high epidemic potential*** to cause a serious public health impact due to their ability to spread rapidly internationally (Cholera, Plague, Yellow Fever, Viral Haemorrhagic Fever);
- ***Principal causes of morbidity and mortality due to communicable diseases and conditions*** in Namibia (Malaria, Pneumonia, diarrhoeal diseases, TB, HIV/AIDS, maternal deaths and injuries);
- ***Priority NCDs or conditions in the region*** (high blood pressure, Diabetes Mellitus, mental health and malnutrition).
- Effective control and prevention ***interventions are available*** for addressing the public health problems they pose (Dracunculiasis, trypanosomiasis); or
- ***Intervention programs supported by WHO*** for prevention and control, eradication or elimination of the diseases exist. For example, the Expanded Program on Immunizations (EPI), and the Integrated Management of Neonatal and Childhood Illness (IMNCI).

These IDSR priority diseases, conditions and events require special reporting requirements which are different from other routine reporting mechanisms for other diseases. Detailed information on how to report priority diseases and conditions is contained in Section 2: Reporting Priority Diseases, Conditions and Events.

See Table 1 on page 36 for the priority list of diseases and conditions under IDSR.

The list of priority public health events to be reported by health facilities should be established by a group of relevant stakeholders from, and related to the National Health Surveillance System. National level is encouraged to keep the list to the minimum possible, to ensure that adequate resources are available to carry out an effective response, and the list is manageable by the system.

NOTE: It is important to remember that countries may select from this list according to their national priorities and epidemiologic situation. Part II (Section 11) of this guide contains disease-specific summary pages.

International Health Regulations

IHR (2005) requires that all countries have the ability to do the following:

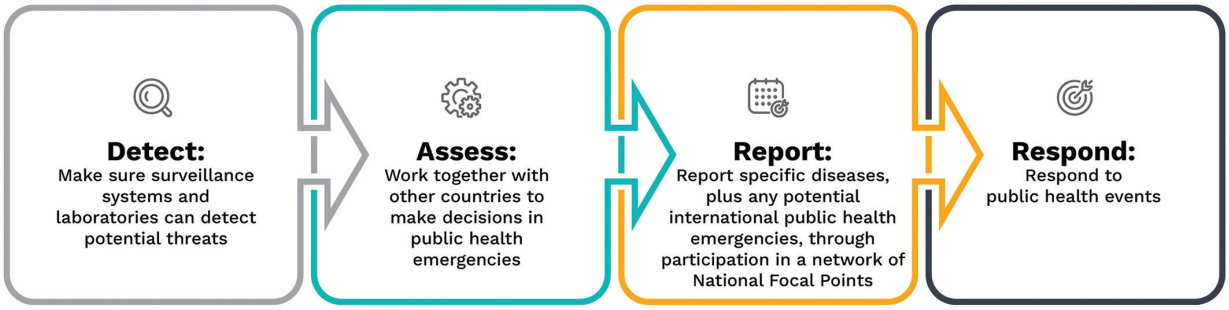


Table 1: Priority diseases, conditions and events for IDSR (2021)

Epidemic prone diseases, conditions or events	Diseases targeted for eradication or elimination	Other major diseases, events or conditions of public health importance
1. Acute Haemorrhagic Fever Syndrome*	1. Bacterial Meningitis	1. Acute Jaundice Syndrome
2. Anthrax	2. Dracunculiasis (Guinea Worm Disease)	2. Adverse Drug Resistance
3. Bacterial Meningitis	3. Leprosy	3. Adverse Events Following Immunization (AEFI)
4. Cholera	4. Lymphatic Filariasis	4. Antimicrobial Resistance
5. COVID-19	5. Malaria	5. Diabetes Mellitus (new cases)
6. Diarrhoea with blood (Shigella)	6. Measles/Rubella	6. Diarrhoea with dehydration less than 5 years of age
7. Smallpox	7. Neonatal Tetanus	7. Epilepsy
8. Plague	8. Poliomyelitis***	8. Human Rabies
9. SARI/ILI**	9. Trachoma	9. HIV/AIDS (new cases)
10. Typhoid Fever		10. Hypertension (new cases)
11. Yellow Fever		11. Injuries (Road traffic accidents)
Also: A cluster of deaths in the community (animal or human deaths)	***Disease specified by IHR (2005) for immediate notification	12. Malaria 13. Malnutrition in children under 5 years of age 14. Maternal/ Perinatal deaths
A cluster of unwell people or animals with similar symptoms		15. Non-neonatal Tetanus 16. Scabies
*Ebola, Marburg, Rift Valley, Lassa, Crimean Congo, West Nile Fever, Dengue		17. Snake bites 18. Severe Pneumonia less than 5 years of age 19. STIs 20. Schistosomiasis 21. Soil transmitted helminths 22. Trachoma 23. Trypanosomiasis 24. Tuberculosis (new cases) 25. MDR/XDR Tuberculosis
	Diseases or events of international concern: Human influenza due to a new subtype*** SARS*** Smallpox*** Zika Virus Disease Yellow Fever Any public health event of international or national concern (infectious, zoonotic, foodborne, chemical, radio nuclear, or due to unknown condition.	

1.12 Organization of the IDSR guidelines

The Technical Guidelines for IDSR presents a comprehensive vision of a disease surveillance and response system. In IDSR, all levels of the health system are involved in surveillance activities for responding to priority diseases and conditions.

The sections in this guide are organized according to these core activities:

- Section 1: Identify and record cases of priority diseases, conditions and events
- Section 2: Report priority diseases, conditions and events
- Section 3: Analyse and interpret data
- Section 4: Investigate suspected outbreaks, and other public health events
- Section 5: Prepare to respond to outbreaks and other public health events
- Section 6: Respond to outbreaks and public health events
- Section 7: Risk Communication and Community Engagement (RCCE)
- Section 8: Monitor, evaluate, supervise and provide feedback to improve surveillance and response
- Section 9: Electronic Integrated Disease Surveillance and Response (eIDSR)
- Section 10: Tailoring IDSR to Emergency or Fragile Health System contexts
- Section 11: Summary guidelines for specific priority diseases and conditions.

The various sections of this 3rd Edition of the IDSR Technical Guidelines have been divided into two parts, in the following order:

Part I:

- Introduction
- Sections 1 - 10

Part II:

- Section 11.

Each section has annexes which reference key functions highlighted in the guidelines. The relevant annexes are found at the end of each section for easy reference.

Every section is relevant for all levels of the health system, and each provides detailed information on how to carry out the functions necessary to attain the required level of surveillance and response in any situation.

Furthermore, a section on eIDSR has been included, which is intended to guide countries as they embark on establishment of eIDSR systems.

Annexes to Introduction

Annex A	IDSR Matrix: Core functions and activities by health system level	39
Annex B	Guidance for assessment of surveillance and response at the district level	46
Annex C	IHR (2005) Decision Instrument	51
Annex D	Potential PHEIC that require reporting to WHO under the IHR (2005)	52
Annex E	Guide for establishing community-based surveillance and response system	54
Annex F	Required surveillance and response core capacities as described in the IHR (2005)	59
Annex G	Roles and responsibilities of various actors in IDSR	61
Annex H	Guide for establishing surveillance and response systems at PoE	65

COMMUNITY							
Identify	**Report**	**Analyse and Interpret**	**Investigate and confirm**	**Prepare**	**Respond**	**Communicate risk**	**Monitor, Evaluate, Supervise and provide feedback to Improve**
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 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 (IPC) 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 the community response to the public health action Give feedback to community members about reported case, events, and prevention activities. Verify if public health interventions took place as planned. Participate in after-action reviews.

HEALTH CARE FACILITIES							
Identify	**Report**	**Analyse and Interpret**	**Investigate and confirm**	**Prepare**	**Respond**	**Communicate risk**	**Monitor, Evaluate, Supervise and provide feedback to Improve**
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.	Ensure HCF and CBS 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.	Establish and 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 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 programs.	Assess community participation. Conduct a 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 CBS workers/ volunteers.

DISTRICT							
Identify	**Report**	**Analyse and Interpret**	**Investigate and confirm**	**Prepare**	**Respond**	**Communicate risk**	**Monitor, Evaluate, Supervise and provide feedback to Improve**
Support HCF to verify alerts from community. Collect surveillance data from HCF and the community and review the quality. Ensure reliable supply of data collection and reporting tools are available at reporting sites. Ensure all HCF have materials for laboratory collection and transport.	Ensure HCF and CBS workers/volunteers know and use SCDs for reporting priority diseases, conditions and events. Maintain list of reporting sites. Provide instructions and supervision for surveillance and reporting priority diseases conditions and events for HCF and communities. Report data on time to the Regional Surveillance Officer (CSO).	Aggregate data from HCF. Use and refine de-nominators 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 give to HCF. Report finding of initial investigation to 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 district rapid response teams. Participate in and support response training for HCF and community.	Together with region select and implement appropriate public health response. Plan timely community information and education activities . Document response activities. In case of outbreaks send daily district 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 district 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 HCFs. Provide feedback to the HCF and community on surveillance activities and priority events . Provide regular, periodic feedback to HCFs and communities on routine control and prevention activities and outbreaks. Monitor and evaluate program timeliness and completeness of reporting from health facilities to the district Monitor and evaluate timeliness of response to outbreaks. Gather information from affected communities on needs and impact of response.

REGION							
Identify	**Report**	**Analyse and Interpret**	**Investigate and confirm**	**Prepare**	**Respond**	**Communicate risk**	**Monitor, Evaluate, Supervise and provide feedback to Improve**
Ensure coordination with respective Community units/ departments to oversee and support community services and CBS with district. Ensure reliable supply of case definition posters, data collection and reporting tools are available at reporting sites. Ensure laboratory specimen collection and transport material is available Track specimens for laboratory confirmation.	Ensure that districts know and use SCDs for reporting and verifying priority diseases conditions and events. Provide instructions and supervision for surveillance and reporting priority diseases conditions and events for healthcare facilities and communities. Receive regular surveillance data from the District Surveillance Officer (DSO) and review the quality. Report data on time to the National MOHSS.	Ensure accuracy of denominators for / region. Aggregate data from DSO reports. Analyse data by time, place and person. 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 district level line lists of suspected cases. Report the confirmed outbreak to national level. Ensure specimen collection kits for investigation activities are available.	Convene emergency preparedness and management committees. 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 SITREP.	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 SOP covering clearance and release of a public health emergency information. Regular update sources accessible to the media and the public for information dissemination. Ensure accessible and relevant information, education and communication materials tailored to the needs of the population.	Monitor and evaluate program targets and indicators for measuring quality of the surveillance system for districts and HCFs. Give feedback to districts on surveillance and data quality findings. Give district regular, periodic feedback about routine control and prevention activities and outbreaks. Produce monthly region surveillance bulletin. Provide regular assessment of staffing needs for IDSR implementation and inform the next level. Conduct regular supervisory visits.

NATIONAL							
Identify	**Report**	**Analyse and Interpret**	**Investigate and confirm**	**Prepare**	**Respond**	**Communicate risk**	**Monitor, Evaluate, Supervise and provide feedback to Improve**
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 CC as necessary.	Train, inform and support lower levels on surveillance and response . Aggregate region reports of immediately reportable diseases and events. Report other priority diseases conditions events and events on time to relevant programs and stakeholders. Include all relevant laboratories in the reporting network. Use IHR Decision Instrument (Annex 2A) 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 region and district 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 (PHEOC) 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, HCWs, affected families and communities. Coordinate response with region and district health teams. Support epidemic response and preparedness activities including deployment of Public Health Emergency RRTs. Follow and adapt risk communication guidelines and social mobilization (Health Promotion Unit MOHSS).	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, SOP and guidelines covering clearance and release of information during a public health emergency. Regular update information sources accessible to the media and the public for information dissemination. Ensure accessible and relevant information, education and communication materials tailored to the needs of the population. Release information quickly in a transparent manner. Ensure the 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, public reactions to facilitate local-level responses. Ensure risk communication is part of the emergency response systems Ensure trained personnel for risk communication are available across all levels	Monitor IDSR and laboratory core indicators regularly . Give regions 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 of 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

WHO COUNTRY OFFICE, WHO AFRO REGIONAL OFFICE							
Identify	**Report**	**Analyse and Interpret**	**Investigate and confirm**	**Prepare**	**Respond**	**Communicate risk**	**Monitor, Evaluate, Supervise and provide feedback to Improve**
Develop and disseminate generic guidelines for surveillance. Encourage documentation & 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 diseases, conditions and events. 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 Activate the IMS Team (IMST).	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 Regions 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 ERF.

POINTS OF ENTRY							
Identify	**Report**	**Analyse and Interpret**	**Investigate and confirm**	**Prepare**	**Respond**	**Communicate risk**	**Monitor, Evaluate, Supervise and provide feedback to Improve**
Use case definitions or alert triggers to identify suspected passengers or events related to travel and transport. Support community in case finding.	Collect and compile Report immediately to the IHR NFP and at the same time district/ national level. Report monthly summaries to the National Surveillance department/unit and at the same time share with the respective district and region.	Prepare and periodically update database of cases/ events detected.	Participate in assessing potentially exposed/infected travellers in a holding 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 meetings.	Coordinate and 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 IPC measures.	Disseminate risk Build relationships, communicate and coordinate for information sharing with various stakeholders (IHR FP, civil aviation/port authorities, ICAO). Build communications with ship and maritime industry operators, regarding authorization and the Maritime Health Declaration. Build relationships with Surveillance Officers across all levels and the IHR NFP.	Monitor and evaluate prevention activities and modify them as needed. Conduct periodic simulation exercises.

Annex B: Guidance for assessment of surveillance and response at the district level

This guidance is for assessment of the national surveillance, epidemic preparedness and response systems and to identify where improvements are needed. Namibia has used newly developed tools such as the JEE as a means of assessing country capacity to prevent, detect and respond to public health events. The assessment provides results that can be used to solve problems with resources, the quality and timeliness of surveillance data, and how the information is used. The MoHSS Strategic Plan could also be used as a reference when preparing a district- specific action plan. Namibia has developed the National Action Plan for Health Security (NAPHS) which can also be used.

The IDSR is not proposing establishment of a new system but is providing guidance on how to prepare to conduct surveillance and response activities. However, if a district has the resources and skills to conduct an assessment to document the situation of surveillance and response activities within the district, or wishes to update the district profile, then they may use the checklist below after adapting it to the local context. This tool could help districts to clearly identify activities which will improve their performance and capacity for disease surveillance and response.

Case and event identification:

1. Determine availability and knowledge of SCDs for reporting suspected priority diseases and conditions including events of public health concern.
2. Define the sources of information about health events in the district, including points of contact the community has with health services.

For example, list the following sources on a list of district reporting sites:

a. Health facilities and hospitals;
b. Laboratories (including non-public ones: private for profit, military, NGOs, faith-based);
c. POE;
d. CHW (including community animal health workers);
e. Community volunteers or focal points (e.g., shopkeepers, street vendors, barbers, farmers, etc.);
f. Traditional birth attendants;
g. Traditional healers;
h. Community leaders who have knowledge of health events in the community (for example, the village elders, school teachers, leaders of faith-based communities, etc.);
i. Public health officers;
j. Private sector practitioners;
k. Public safety officers such as fire, rescue or police departments;
l. Animal health and veterinary structures and services;
m. Industry, food safety and environmental health laboratories;
n. Mass media, web sites and health news search applications;
o. Others including NGOs; and
p. Other community groups such as women's groups.

It is important to also have, and maintain a logbook of rumours to report events, as well as a feedback loop to confirm or dispel rumours.

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

Reporting:

4. Specify the priority events, diseases and conditions for surveillance within the district and those directed by national policy.

List diseases that are:

   a. Epidemic-prone or events which require immediate reporting e.g., unexplained cluster of illness or deaths.
   b. Diseases targeted for eradication and elimination.
   c. Other diseases of public health importance including NCDs.

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 sources and outpatient sources.

For example, a minimum requirement would be to report all cases and deaths for the selected diseases and conditions.

   a. State the diseases or conditions that require immediate reporting, and communicate the list to health facilities in the district.
   b. Define the means for reporting data to the district (by phone, or by completing a form). In the case of electronic reporting, determine whether all facilities have access to computers and WiFi connectivity. Specify how electronic reporting should be done and in the case of paper forms being used to collect data, how transcription will be done to transfer the data from paper to electronic form.
   c. Define how often the required data should be reported.
   d. Define a feedback mechanism from district to higher levels (region and district levels).

6. Define the data management tools available in the district and how they should be used in an integrated system. Define how frequently the tools should be used for reporting diseases, conditions or events.

   a. Case investigation forms (CIFs)
   b. Diagnostic (if POC is used) and lab-specimen-based surveillance reporting forms.
   c. Specimen tracking forms/logbooks (within the laboratory) and also forms/logbook for referral of specimens.
   d. Line lists for use in outbreaks while also ensuring comprehensive capture of variables from other non-human sectors.
   e. Contact tracing forms.
   f. Tables for recording summary totals:
      i. Routine weekly reporting forms
      ii. Routine monthly reporting forms
      iii. Routine quarterly reporting forms
      iv. Graphs for time analysis of data
      v. Maps for place analysis of data
      vi. Charts for 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 district, region and national levels. If electronic reporting is NOT available, ensure that the focal points who are required to manage data have a reliable supply of data collection forms, paper, coloured pencils, graph paper, and logbooks.

8. Define mechanisms to ensure data is collected as per given timelines, and put relevant mechanisms for accountability in place if reports are not submitted on time.

Data analysis:

9. Define the data management requirement for each reporting site. Develop and disseminate the procedures including deadlines, so that reporting sites know that they must report each reporting period (e.g., monthly).

    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, community leaders and track implementation of recommendations.

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

11. Gather and present relevant data about the district which can be used to advocate for additional resources for improving surveillance and response activities. (Example: health workers are able to document an increase in Malaria cases in their district and they know that an effective response would be insecticide-treated bed nets. The district surveillance officer uses this data to show the potential expected reduction in malaria cases in that district if some of the community's bed net cost could be supported by local businesses).

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 district.

    For example, list the following:

    a. Public, private or NGO district facilities which have PoC diagnostics or use Rapid Diagnostic Test (RDT) laboratory services
    b. Public, private or NGO district facilities with reliable laboratory services for confirming priority diseases.
    c. Prevention, control or special surveillance activities in the district with laboratory access (for example, any sentinel surveillance sites in the district).

13. Describe the methods or mechanisms 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 district rapid response team so that assessing preparedness is a routine agenda item of the team.

See Section 4 for composition of the Public Health Emergency RRT.

15. Identify a coordination mechanism which will oversee 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 response and planning process for meetings.

See Section 5.

Specify and disseminate schedules for:

a. Meetings to routinely assess preparedness for public response and discuss current problems or activities. Mechanisms like reminders can be put in place to ensure that meetings are conducted 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 activities and interventions which the district can do, and which require external assistance.

See Sections 4, 5, 6 and 9 for standard key elements that are needed ifor preparedness and response activities.

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

Communication and Feedback:

18. Define methods for informing and supporting health workers in the implementation of integrated disease surveillance.

For example:

a. List the current opportunities for training health workers in surveillance, response or data management in the district.
b. Coordinate training opportunities between disease programs that take advantage of overlapping skills between programs such as supervision, report writing, budgeting, data analysis, and using data to set priorities.
c. Define the training needs for each category of health workers 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. Establish 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 district surveillance focal persons and other focal persons from animal and environment sectors, and other key relevant sectors. Clarify who is responsible for reporting at each level periodically. Include methods such as monthly meetings, newsletters, telephone calls etc.

20. Review and update feedback procedures and methods between the district, health facilities and community, as well as between the district and higher levels.

Specify the feedback methods and update as necessary:

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

21. Outline the communication mechanisms available for RCCE including protocols and guidelines. 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 (EPR) committee that can be activated during an outbreak and for routine activities.

See Sections 6 and 7 in this guide on the key elements for risk communication before, during and after the outbreak.

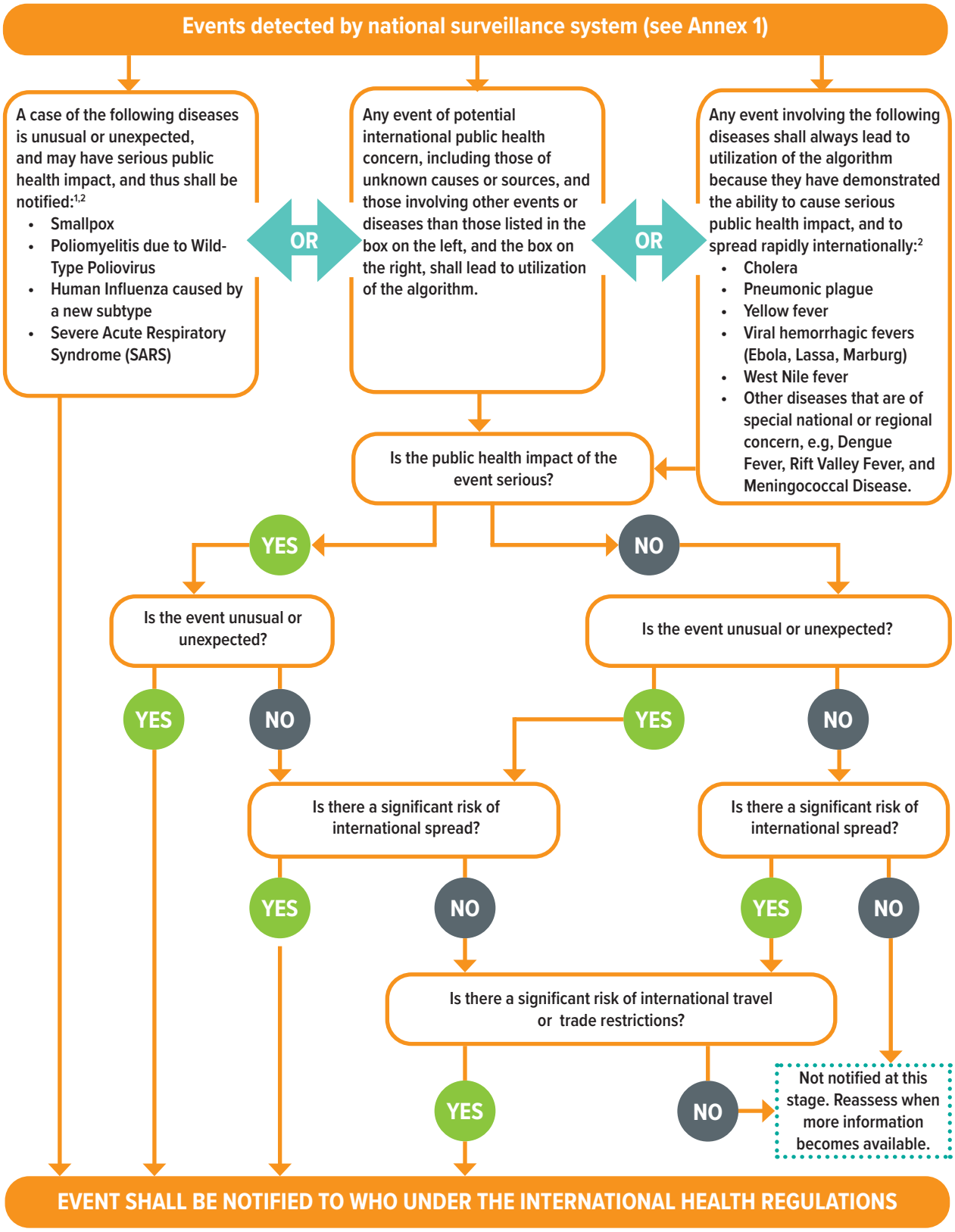
Evaluation and improvement of the surveillance system:

22. Decide if additional indicators will be evaluated and plan 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 district over the next year, based on evidence.

Annex C: IHR (2005) Decision Instrument

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



[1] As per WHO case definitions

[2] The disease list shall be used only for the purposes of these Regulations

*States Parties that answer 'yes' to the question whether the event meets any two of the four criteria above, shall notify WHO according to Article 6 of the IHR (2005)

Annex D: Potential PHEIC that require reporting to WHO under the IHR (2005)

Surveillance on specific risks

The control or containment of known risks to public health is one of the most powerful ways to improve international public health security. The threat posed by known risks constitutes the vast majority of events with a potential to cause public health emergencies that fall within the scope of the IHR (2005). There are already existing control programmes that address infectious diseases as well as food and environmental safety and contribute significantly to the WHO Global Alert and Response System.

These environmental hazards include but are not limited to:

- Chemical;
- Food;
- Ionizing radiation; and
- Non-ionizing radiation.

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

See references at the end of this section.

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

1. **Environmental health emergencies like:**
   - Natural events;
   - Technological Incidents;
   - Complex emergencies; and
   - Deliberate events.

2. **Chemical risks in food:**
   - Acute and chronic dietary exposure (environmental or intentional pollution).

3. **Zoonosis:**
   - Emerging zoonosis; and
   - Neglected zoonosis.

Topics for surveillance on specific risks:

4. **Infectious disease hazards**
   Known, new and unknown infectious disease threats.

5. **Zoonotic disease events**
   Using a One Health approach is critical to link human health to animal health at the human-animal-environment interface. Coordinating, collaborating, and communicating across sectors and One Health partners allows us to maximize resources while achieving optimal health for people and animals living in a shared environment. Detecting diseases that affect animals is important as they may pose a risk to human health and early detection could save lives.

6. **Food safety events**

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

7. **Chemical events**

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

8. **Radiological and nuclear events**

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

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

Annex E: Guide for establishing community-based surveillance and response

Community-Based Surveillance (CBS) is a simple, adaptable and low-cost public health initiative managed by communities in coordination with the formal surveillance structures. Communities and designated community focal points are trained and empowered to be aware of potential health risks including emerging events that might indicate a new health risk, close monitoring for notifiable and seasonal diseases, or signs of an existing disease outbreak. An event that appears unusual, odd or inexplicable to the community might be - to a health-trained professional - an early warning sign of a more serious and larger health risk or public health event.

Two different strategies of community-based surveillance can be used to collect community information:

1. Community Event-Based Surveillance (CEBS)

CEBS relies on reporting of **unusual EVENTS** and this is designed to rapidly identify whether something might be wrong in the community. Information may be incomplete, unconfirmed and may even be a rumour. The definition of an unusual event will change from one community to another, and needs to be defined in each context. It can be one event, or a cluster of events, that may be unusual for a specific community or during a certain time of year. For example, an unusual event could be: *"A cluster of deaths from an unknown cause in the same household or adjacent households."*

2. Community-Indicator Based Surveillance (CIBS)

This type of surveillance is used to identify/ report events based on agreed indicators (case definitions). Information from the community comes from people who have already been oriented on the indicators, including CBS volunteers or any other representatives from community.

CIBS relies on the reporting of a suspected case, or the trend of a specific disease(s) using a community case definition. Community case definition means that two or three easily identified symptoms are associated with a specific disease. It is a more basic form of syndromic (symptom) reporting than is used by health professionals in national/IDSR and other disease surveillance systems. For example an Influenza (flu) community case definition is reported as: *"sudden illness, fever, cough and difficulty breathing or new, floppy paralysis for AFP."*

Both systems should be established to ensure all information from the community is captured and quickly reported to a designated surveillance focal person at the next level for follow up. Moreover, these two elements of surveillance should be integrated at the community level.

Steps for establishing Community-Based Surveillance (CBS)

A crucial step in establishing CBS is to ensure that there is buy-in by both the national and subnational level authorities. This will enable the CBS system to be recognized formally as part of the National Surveillance System and designated people will then be appointed.

A designated health facility manager or surveillance officer responsible for coordinating CBS activities has the following duties:

a. Determine the availability and knowledge of standard community case definitions for reporting suspected priority diseases and conditions, and events of public health concern within the facility.

b. Sensitize community leaders, elders and other influencers about the need for CBS: what information is needed, how the information will be used, the process that is being proposed, the characteristics of successful CBS focal persons, any financial or human resource support being offered by the district, and what the community will gain by participating.

c. Define the sources of information about health events in the community including points of contact that the community has with health services. A key informant selected from these sources can form community networks that support the CBS focal persons in the early detection of alerts. For example, a source of information could be the women and men that often visit a specific grain milling or water collection point because they would know what is happening there and can report on it.

Other possible sources of information include:

Home Visits: CBS focal persons are expected to visit all homes in their catchment area regularly, to inquire about priority diseases and/orany deaths that might have occurred since their last visit to that particular home.

Gathering Places: Information on priority events could also be collected by frequently going to village gatherings and meeting places. This is not a substitute to home visits, but rather another approach to ensure that all priority events are identified in good time. Meeting places in the community are those places where people gather to talk and share news by word-of-mouth such as:

i. **Grain milling or grain pounding places**: In some communities, women gather every day in the same place to mill, grind or pound grains into flour. Women often exchange news about their families and the neighbourhood as they work.
ii. **Drinking places:** In some communities, men gather every day in the same places to drink and socialize. These places may be bars or other drinking places, in someone's home or shop, or in the shade under a special tree. As they drink, the men sometimes tell each other the news about their families, friends and neighbours.
iii. **At the market:** A lot of information and news is exchanged at the market. Most people spend some time buying or selling things, and also talk to friends, and neighbours while at the market.
v. **At churches, mosques or other religious institutions:** Religious leaders sometimes make announcements before or after the service to let people know about things that are happening in the neighbourhood. Also, people who attend church or mosque often talk together before or after the service to exchange news about their families, friends and neighbours.
v. **At the home of the village chief or the place where village elders meet:** The village chief and elders are usually kept informed about things that happen in their community. They often gather to talk about community news or to discuss problems and make decisions.
vi. **At schools:** Teachers and pupils often share information and news about their families and friends at school or when they play in the school yard.

d. Identify surveillance focal persons for each source of information in collaboration with the community. Identify and specify the opportunities for community involvement in surveillance of health events and the role of the CBS focal person(s). Focal persons should be people who are trusted by the community, committed to 'zero-case' reporting, and they should be reassured that reporting rumours won't get them into trouble, so there would be no need to falsify data for any reason.

e. Specify the alerts, events, diseases and conditions for surveillance within the catchment area and those directed by national policy, and specify the trigger mechanisms.

f. Compile a list of epidemic-prone diseases, diseases targeted for eradication and elimination, andother diseases of public health importance including non-communicable diseases.

g. Define methods for informing and supporting focal points in the implementation of CBS e.g., monthly meeting, telephones. List the current opportunities for training focal persons in surveillance and response.

h. Define the training needs. Develop and pre-test picture-based/simplified training materials for non-literate/ semi-literate populations for use in surveillance and reporting training workshops. Develop picture and game-based job aids and illustrative daily/weekly schedules.

i. Train CBS focal persons in surveillance and response skills as well as improved Interpersonal Communication (IPC) skills, using interactive training, adult learning techniques and role playing. A mobile phone can be used to listen to, or show audio or video clips during training and in the community.

j. Describe how communication about surveillance and response takes place and how it will be tracked between the health facility/surveillance officer and the CBS focal persons. For literate CBS focal persons, design simple alert forms and show them how to fill in information. Appropriate mechanisms for capturing information need to be developed for non-literate people. Identifying a family member who can assist with the actual writing of the report would be helpful in this case.

k. Monthly meetings and telephone calls ensure tracking of CBS focal persons.

l. Review and update procedures and methods of supportive supervision and feedback between the health facility and the community focal persons. Regular refresher trainings should be conducted to ensure that community focal points understand what and how alerts should be reported.

m. Explain the communication link between community focal points and health facilities to the epidemic management committee which can be activated during an outbreak and for routine activities.

n. Develop general, visual, and social media materials to raise awareness in the community, with youth or at schools.

o. Conduct periodic meetings between the health facility surveillance focal points, CBS focal persons and community leaders to discuss progress, issues, concerns and providea feedback loop.

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

Formalized CBS framework

CBS should be implemented in a formalized framework, where participants are well versed in what constitutes an unusual type of event to report (an alert). For example, an unexplained cluster of similar severe illnesses within one week, or high absenteeism at school). How and when to report should also be clear (e.g., through messages or calls from mobile phones). The framework should be supported by trained facility or dedicated district staff and should be regularly evaluated.

Community representatives that can be members of a CBS team

Any community member accepted by the community can be the CBS focal person. They should be selected by the communities they live in so as to increase empowerment and ownership of CBS. Representation could be from basic village-level services such as community health volunteers, CHWs, community, or similar care providers, leaders (religious, traditional or political), school teachers, veterinarians, agricultural extension workers, and traditional healers. In other communities, a respected non-health person such as the barber, shop keeper or an elder who regularly talks to community members are also effective focal points.

Once selected, the CBS focal persons should receive training and carry out their role on how to recognize certain diseases or health conditions for the purpose of reporting suspect cases.

CBS Supervision

The goal of supervision is to improve timeous reporting, fine-tune understanding of case definitions, and improve interpersonal communication skills. It is important that supervision is done with evidenced-based approaches so as to know what to improve in the surveillance. All activities for implementation by CBS should be coordinated by a surveillance officer or health facility in charge.

They will:

- Prepare a list of priority diseases, event or conditions for inclusion in the CBS, based on the adapted IDSR technical guidelines.
- Share as appropriate, a list of simplified community case definitions to facilitate case detection, event detection and monitoring.
- Provide visual training material and job aids.
- Build capacity of CBS focal persons in all aspects of surveillance and response.
- Regularly strengthen the skills and practices of focal points in all appropriate aspects of surveillance and investigation, particularly the handling and dissemination of data.
- Establish a feedback mechanism which is critical for ensuring that CBS continues to work.
- Ensure that constructive supervision is implemented and community focal persons are credited and praised for their good work, and areas for improvement can be identified.
- Disseminate alerts to relevant places within the community, as appropriate, using posters or any other intervention methods that have been proven to work in that area (banners, leaflets, radio, SMSs etc.
- Monitor surveillance and response activities, including timeliness and completeness of reporting.
- Supervise the activities of the CBS focal person including the detailed understanding of the case definitions. In the case of contact tracing, ensure that the process is done in collaboration with the health facility in charge.
- Identify and map key health determinants in the area.
- Provide regular and timely feedback to CBS teams and ensure a two-way process for feedback to build trust between the CBS and the health facility in-charge.

CBS focal persons may be many in number and coordination might pose a challenge. A district could then appoint a CBS Supervisor in a particular community (she/he might be among the CBS FPs), to oversee a specific number of CBS FPs. The role of the CBS supervisor should be clearly stipulated in order to support them when deciding whether the notified case is a health risk.

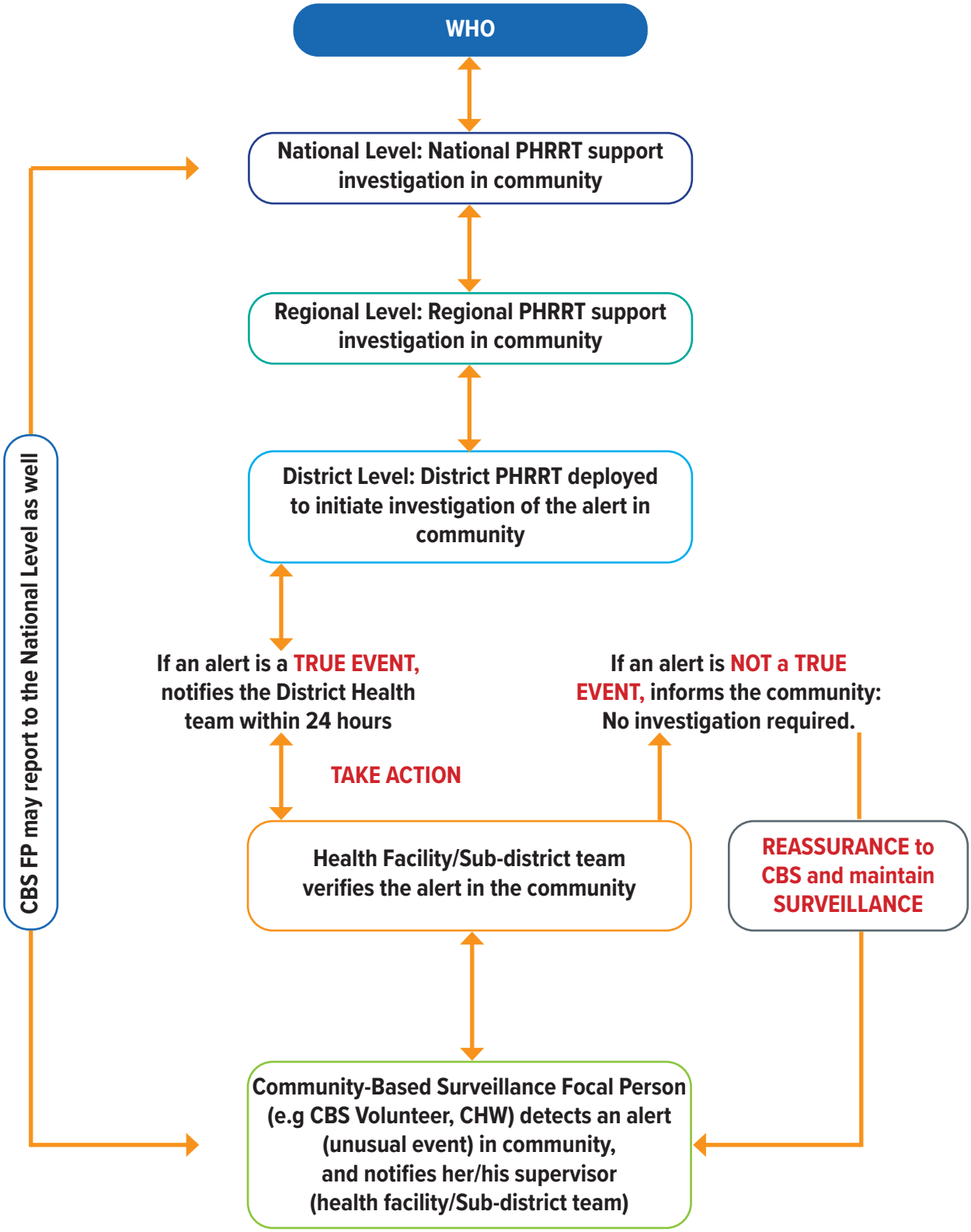
Sources of information for CBS

A functioning CBS should establish relationships with key sources of information. This includes but is not limited to the following sources of information:

- All CHWs, community volunteers, including traditional birth attendants, schoolteachers, pharmacists who have trusted relationships with the local community. They are often located in remote areas where access to primary health care is limited. Families often share information with a trusted, known health worker.
- Community, traditional, youth or religious leaders and civil society. These individuals and groups may provide informal reports of unusual health events or health risks that they witness in their communities.
- Local, national and international media are important sources of information for CBS. Events such as clusters of human cases, outbreaks or unexpected and unusual deaths may be covered by local newspapers (printed or online), or broadcast by radio, before they are detected and reported by local health services.
- Traditional healers, spiritual healers and herbalists often have ancestral knowledge and this may constitute a valuable information source. Families with sick members often seek spiritual guidance for healing.
- Alternative medicine, complementary medicine and non-conventional medicine include health care practices that are not integrated into the dominant health care system.

! ***NOTE: Additional reference materials for CBS can be found in the Integrated Disease Surveillance and Response in the African Region: WHO Guide for establishing Community-Based Surveillance and Response Program (August 2014) and IFRC: Community-Based Surveillance: Guiding Principles, March 2017.***

Reporting structure for community alert and verification



Annex F: Required surveillance and response core capacities as described in the IHR (2005)

According to the IHR, member states should 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. The ability of existing national structures and resources to meet the minimum requirements should be assessed. Based on the results of the assessment, the country should develop and implement an action plan to ensure that these core capacities are present and functioning throughout the health system.

IHR (2005) Annex A: Part A defines the core capacity requirements for surveillance and response.

The regulations recognise the following three levels of the healthcare system:

- Community or primary public health response level;
- Intermediate public health response level (region and district); and
- 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:

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

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

- Clinical descriptions of cases;
- Laboratory results;
- Sources and type of risk;
- Numbers of human cases and deaths, and
- Conditions affecting the spread of the disease and these may include environmental issues such as:
  - water and sanitation,
  - travel history of self and neighbours,
  - cultural practices e.g., burial practices,
  - distance to health facility/care seeking efforts before detected,
  - weather and accessibility,
  - floods,
  - insecurity, and
  - migrant/Internal Displaced People (IDP) /refugee population.

The public health measures employed might include any by-laws which have been instituted, or implementation of hygiene measures etc.

Intermediate public health response levels (National, Region and District)

The core capacity requirements at intermediate levels are the following:

a. to confirm the status of reported events and to support or implement additional control measures; and
b. to assess reported events immediately and, if found to be urgent, to report all essential information to the national level within 24 to 48 hours. For the purposes of this annex, the criteria for urgent events includes serious public health impact and/or unusual or unexpected nature of the event, with high potential for spread.

National Level: Assessment and notification

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

a. Coordinate with the World Organisation for Animal Health (WOAH) focal person, and the International Food Safety Authorities Network (INFOSAN) focal person, and other sectors to ensure coordination in assessment and notification of events;
b. Assess all reports of urgent events within 48 hours; and
c. Notify WHO immediately through the National IHR Focal Point when the assessment indicates that the event is notifiable under Article 6: paragraph 1 of the IHR, and the decision instrument for the assessment and notification of events that may constitute a PHEIC in Annex 2 of IHR (2005). Also inform WHO as required, and as stipulated in Article 7, and paragraph 2 of Article 9 of the IDHR.

At the national level, the public health response must have the capacity to:

a. Coordinate the public health response by establishing a coordination mechanism which could include setting up of the Public Health Emergency Operation Centre (PHEOC) or a similar coordination structure, and activation of the Incident Management System. See Section 5 and 6 for more information.
b. Rapidly determine the required control measures to prevent domestic and international spread.
c. Provide support through specialized staff, laboratory analysis of samples (domestically or through collaborating centres), and logistical assistance (e.g., 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 and implement containment and control measures.
f. Provide direct liaison with other relevant line ministries.
g. Provide communication links with hospitals, clinics, airports, ports, ground crossings, laboratories and other key operational areas for the dissemination of information, and recommendations received from WHO regarding events in the State Party's own territory and in the territories of other States Parties.
h. Establish, operate and maintain a multi hazard plan, including the creation of a One Health team, to respond to events that may constitute a public health emergency of international concern; and
i. Provide the above on a 24-hour basis.

During several consultations at global level, the core capacities have been summarized into eight components:

1. legislation;
2. policy and coordination;
3. surveillance;
4. preparedness;
5. response;
6. risk communications;
7. laboratory; and
8. human resources.

All of the eight components are also important for IDSR.

Annex G: Roles and responsibilities of various actors in IDSR

Roles and responsibilities of a community-based surveillance focal person

- Use simplified case definitions to identify priority diseases, events, conditions or other hazards in the community.
- Conduct household visits on a regular basis and meet with key informants on a regular basis.
- Attend local ceremonies and events, and follow up on anything unusual e.g., someone you were expecting to be there doesn't show up.
- Record priority diseases, conditions, or unusual health events on the reporting forms and tools (tally sheets), and report immediately within 24 hours.
- Participate in verbal autopsies by asking interview questions prepared by the supervisor at the health facility.
- Send rapid notification, of the occurrence of unexpected or unusual cases of disease or death in humans and animals for immediate verification and investigation, according to the IHR (2005), and in line with the IDSR strategy (within 24 hours) to the nearest health facility and other relevant sectors.
- Involve local leaders in describing disease events and trends in the community.
- Sensitize the community to report and seek assistance for priority diseases, conditions, and unusual events.
- Support health workers during case or outbreak investigation, and contact tracing.
- Mobilize local authorities and community members to support response activities.
- Participate in risk mapping of potential hazards and training, including simulation exercises.
- Participate in containment and response activities, in coordination with the district level. This includes home-based care, social or behavioural change (e.g., traditional practices), logistics for distribution of drugs, vaccines or other supplies. Providing factual health education in a crisis is critical.
- Give feedback to community members about reported cases, events, and prevention activities.
- Verify whether public health interventions took place as planned with the involvement of the community.
- Participate in meetings organized by health facility, district, and higher-level authorities.

Roles and responsibilities of health facility and (PoE) staff

- Identify cases of priority diseases using the SCDs.
- Record case-based information and report immediately notifiable diseases, conditions and events to the next level.
- Liaise with the district on how to conduct immediate laboratory investigation of suspected cases.
- Manage and refer cases.
- Quarantine suspected cases.
- Prepare for and participate in outbreak investigation and response, and case management.
- Report summary and case-based data (weekly report) timeously to the next level.
- Conduct simple data analysis (graphs, table, charts) at point of collection.
- Communicate diagnosis for outbreak prone diseases to district/ community.
- Convene district rapid response team.
- Identify resources (human, financial, commodities, airtime) and timeline for deployment.

Roles and responsibilities of Surveillance FP at district level

- Investigate and verify possible outbreaks, collect diagnostic samples, advise on treatment/prevention protocols.
- Prepare and analyse weekly surveillance reports and submit to higher authorities in a timely manner.
- Ensure that surveillance sites maintain surveillance reports and ledgers/logbooks in an appropriate manner.
- Maintain a list of all reporting sites.
- Establish and maintain database of all trained and registered HCWs who can serve as surveillance FPs at reporting sites as well as other CBS FPs.

- Ensure an adequate supply of data collection and reporting tools at the surveillance reporting sites.
- Ensure that the IDSR SCDs for all priority diseases are understood and used by HCWs at the site. Provide onsite training if necessary.
- Monitor performance indicators (such as timeliness and completeness) of the IDSR as stipulated in the IDSR guideline.
- Periodically update graphs, tables, charts, etc. and compare current data with previous data per months and quarters, or even weeks or years (important for seasonal events) and make recommendations for appropriate response.
- Provide in-person feedback to surveillance reporting sites on a weekly or monthly basis regarding implementation of the IDSR.
- Closely follow up (direct calling) with the reporting sites to ensure they report data on time.
- Conduct regular, supportive supervision visits to surveillance sites, including health facilities, PoE and communities, to assist them to build capacity to analyse and interpret data for decision-making. Sign and date the inpatient and outpatient record books, registries or phone entry to document the visit and write up any recommendations for improvement.
- Support the health facility to verify alerts from the community.
- Arrange and lead investigation of verified cases or outbreaks
- Maintain an updated line list of suspected cases.
- Assist the health facility in the safe collection, packaging, storage and transport of laboratory specimens for testing/confirmation testing.
- Receive laboratory results from the region and deliver these to the health facility.
- Conduct/coordinate on the job trainings for surveillance sites with new staff.
- Review the quality of surveillance data from time to time by conducting data quality audits and recommend appropriate measures to improve data quality in the district.
- Maintain a rumour register to record events for the surveillance site.
- Ensure cross-border (district-district) coordination and collaboration on surveillance issues, and provide notification of any outbreaks in the neighbouring district. International or cross-border notification should also be done if necessary.
- Document the value-added importance of IDSR, and advocate to health management team to support IDSR activities.
- Participate in outbreak investigations and ensure there is an updated register/line list.

Roles and responsibilities of the District Coordination Committee

- Support the SFP at the district level to implement planned activities.
- Ensure surveillance activities are included in overall district health planning.
- Liaise with district officials to mobilize funds (at district level) for surveillance activities .
- Ensure timely release of funds for surveillance activities.
- Monitor IDSR performance, and outputs of data analysis and monitoring tools.
- Participate in risk mapping of the district, and in development of a plan of action based on the findings.
- During outbreaks, assist the Public Health Emergency Management committee (PHEMC) in organizing the Public Health Emergency Rapid Response Teams (PHERRT) and ensure their functionality.

See Section 5 for more information.

- Report findings of initial investigation to region.
- Participate in risk mapping and community assessment.
- Participate in establishment of the emergency preparedness and response committees and ensure their functionality.
- Design, and set up implementation of community health education programs and provide training.
- Participate in and support response training for the health facility and communities.
- Together with the region, select and implement an appropriate public health response.
- Plan timely community information and education activities.
- Document response activities.
- In case of outbreaks, send Daily Situational Report (SITREP).

Roles and Responsibilities for other political leaders at district level

Constituency councillors and traditional leaders have a very important role to assist in fostering behavioural change on disease surveillance due to their influential positions.

They can play the following roles:

- Support any declarations of a public health emergency.
- Develop an inventory and identify human/financial/logistics support that can be provided locally. A quick response to any event will often prevent spread.
- Ensure that principles of hygiene and sanitation are followed (environmental cleanliness, availability of latrines and their use, advocate for people to drink clean and safe water, advocate for continued personal hygiene and sanitation measures including handwashing).
- Report clusters of illness/death to a nearby health facility.
- Implement by-laws to enhance the principles of hygiene and sanitation.
- Take an active role in sensitizing community members on how to promote, maintain and sustain good health.
- Facilitate community-based planning, implementation, and evaluation of health programmes within their area of jurisdiction (IDSR is among the programs).
- Follow up any outbreak in collaboration with health workers and other extension workers.
- Provide administrative backup to health workers at health facility level.
- Support the enforcement of relevant legislations to prevent/control outbreak of infectious diseases.
- Supervise subordinates in ensuring principles of hygiene and sanitation are followed.
- Ensure regular meetings of disaster risk management committee when an outbreak occurs (at all levels - Local Section 17, Regional Section 14 as well as at National Section 4 of the DRM Act).
- Discuss disease patterns and their implications for action, as part of regular meetings with the DCC.
- Ensure that various committees are established and are facilitated to perform activities.
- Solicit resources from various sources to respond to disasters, including epidemics.
- Conduct advocacy in the district on health matters in different campaigns.
-

Roles and responsibilities of the Regional Health Management Team

- The Regional Director liaises with the Regional Governor.
- Support the regional and district SFP to implement planned activities in respective districts.
- Ensure surveillance activities are included in the overall region/health planning, as well as in the plans of respective districts.
- Liaise with regional officials to mobilize funds for surveillance activities, and ensure timely release of funds for surveillance and response activities for the entire region.
- Monitor IDSR performance of districts, and outputs of data analysis and monitoring tools.
- Participate in risk mapping of the districts and assist in the development of a plan of action based on the findings.
- During outbreaks, assist the PHEMC in organizing the PHERRT and ensure functionality at both regional and districts level (see Section 5 for more information).
- Report findings of any initial investigation to national level.
- Participate in establishment of emergency preparedness and response committees for the region and respective districts, and ensure their functionality.
- Assist districts in risk mapping and community assessment.
- Assist districts in the design and implementation of community health education programs.
- Participate in and support response training for districts.
- Assist districts to implement an appropriate public health response, and also facilitate surveillance and response initiatives in cross-border districts.

Roles and responsibilities of National level

- Set up a PHEOC or similar coordination mechanism for the preparedness and response activities of a public health event, including IMS plans and procedures.

See Section 5 for more information.

- Identify a spokesperson and outline the risk communication plan, including engagement with media on the sharing of information before, during and after a public health emergency.
- Set standards, policies and guidelines for IDSR and update the EPR plans based on simulations, IAR and AAR reviews.
- Assess available capacity at national level and adjust accordingly, while ensuring the inclusion of surge capacity in the EPR plan.
- Identify domestic resources, mobilize and coordinate external support for implementation of the IDSR.
- Conduct overall supervision, monitoring and evaluation of IDSR activities.
- Produce and disseminate epidemiological bulletins.
- Monitor implementation of inter-country, regional and international agreements/protocols.
- Support investigation of suspected epidemics detected through surveillance.
- National level data management and analytic support.

Roles and responsibilities of WHO and other partners (UN agencies, US-CDC, Africa CDC, USAID, PATH MSF, NRCS, etc.)

- Contribute to setting standards and developing guidelines.
- Provide technical assistance, expertise, and other material support to strengthen the country's disease surveillance, and laboratory and health information systems.
- Support MoHSS in mobilizing resources for surveillance and response activities.
- Support in supervision, monitoring and evaluation of IDSR.
- Management support e.g. writing funding proposals.
- Support capacity building (training, equipment etc.)
- Provide support during public health emergencies and outbreaks (sending technical experts, surge staff (if needed during response), portable laboratories, other equipment and vaccines, etc.)

! NOTE: The role of WHO role is to facilitate coordination with other partners and other UN agencies.

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

A. Purpose

The purpose of the IHR (2005) is to prevent, detect, protect against, control and provide a 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 of national capacity for surveillance and control, including sites such as points of entry (PoE) (i.e., ports, airports and ground crossings); prevention, alert and response to international public health emergencies, global partnerships and international collaboration. In addition to the IHR (2005), it is essential that border health activities be sustainable and aligned with other surveillance activities under IDSR.

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

B. Key Partners

Line ministries, airlines and maritime authorities, port authorities, and all relevant sectors, as well as, WHO, the International Organization for Migration (IOM), CDC and other key partners as appropriate.

C. Key Areas for surveillance and response at PoE

1. Routine measures should be in place at PoE 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 PoE to a health facility.

2. Detection of ill travellers should include, at a minimum, the following:

    - Reporting of ill travellers or deaths onboard international aircraft, ships or at ground crossing points who arrive at PoE, stipulated by various guidelines.
    - Port Health Officials and /or immigration officers who are present at select PoE should be trained to recognize ill travellers during their routine assessments, as well as to conduct an initial assessment of whether the illness poses a potential public health risk.

3. Institution of initial response to an ill traveller if detected at a PoE should include, at a minimum, the following:

    - The ability to rapidly isolate the ill traveller from others to avoid potential spread of disease.
    - A standby health team should be available, either in person or remotely by telephone, to conduct a rapid assessment of ill travellers detected at PoE to determine if a communicable disease of public health concern is suspected.
    - A health facility located close to the PoE should be designated to provide medical care as needed, to severely ill travellers or those with a suspected communicable disease of public health concern. The designated facility should have adequate infection prevention and control capacity to prevent the spread of disease to staff or other patients, and diagnostic capacity including access to laboratory diagnostics.
    - Ambulance service or other safe transportation should be available to facilitate the transport of ill travellers from the PoE to the designated health 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 the WHO.

Role of competent authorities

Competent authorities at designated PoE shall:

- Report all events and diseases with epidemic potential detected at PoE to the next higher level, immediately.
- Notification should also be made to the National Level, with a copy of the report, provided, for an assessment to be made by the National IHR Focal Point, using the decision algorithm. For example: In the case of travellers coming from endemic or risk areas for yellow fever, vaccination for yellow fever should be included.
- If a traveller is a suspect case, immediately fcomplete the passenger screening form/alert notification form. Ensure that the traveller/suspect case is kept separate from others including family members. Ensure that the suspected case is transferred to the nearest holding room/designated quarantine room.
- A traveller/suspect case may not be symptomatic at the time of travel. In such a case, the appropriate deinformation should be taken and the traveller transferred to the nearby health facility for close monitoring. The health facility will liaise with the community focal person for close follow-up
- Baggage, cargo, containers, conveyances, goods, postal parcels and human remains departing and arriving from affected areas must be closely monitored and maintained, to prevent them from being sources of infection or contamination, including vectors and reservoirs.
- Ensure, as far as possible, that facilities used by travellers at PoE are maintained in a sanitary condition, and are kept free of sources of infection or contamination, including vectors and reservoirs.
- Supervise the de-ratting, disinfection or decontamination of baggage, cargo, containers, conveyances, goods, postal parcels and human remains, or sanitary measures for persons, as appropriate, and as specified in the regulations.
- Advise conveyance operators, as far in advance as possible, of their intent to apply control measures to a conveyance, and provide, where available, written information concerning the methods to be employed.
- Report suspected cases to the nearest/designated health facility as soon as possible and arrange transport to the health facility.
- Ensure that all completed forms are stored properly. If a computer is available, create a database and keep a record of all events.

During an emergency or outbreak response, cross-border coordination should:

- Arrange a partners meeting, as soon as the epidemic or event is recognized.
- Assess the need for, and request support from PHEMC or PHERRT when necessary.
- Meet regularly to assess the status of the outbreak or epidemic as indicated.
- Regularly share surveillance data addressing case counts (including zero cases if applicable), and the status of contact tracing (if indicated).
- Share information on travel history of cases and identified contacts to facilitate a coordinated response on both sides of the border.
- Regularly review the epidemic response and take action to improve epidemic control actions as indicated.
- Document and communicate epidemic response actions, and escalating notifications as needed.

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SECTION 1

IDENTIFY AND RECORD CASES OF PRIORITY DISEASES, CONDITIONS AND EVENTS

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SECTION 1: IDENTIFY AND RECORD CASES OF PRIORITY DISEASES, CONDITIONS AND EVENTS

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1. Detect and record cases of priority diseases, conditions and events

The IDSR strategy incorporates both Indicator-Based Surveillance (IBS) and Event-Based Surveillance (EBS) approaches for the early detection of priority diseases, conditions and events. This section describes how to detect priority diseases, conditions and events using Standard Case Definitions (SCDs). In addition, the section gives guidance on establishing EBS and using this approach for the detection of alerts, triaging and verification to detect public health events. Procedures which need to be followed when planning for the improvement of surveillance and response activities in a specific catchment area are further described, and the role of laboratory in surveillance and response is emphasized.

1.1 Detection of priority diseases, conditions and events

All health workers - including those working with human, animal and environmental health - conduct surveillance activities at every level of the health system (public and private) in order to detect public health problems of concern in their communities.

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

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

Surveillance priorities can be communicable and non-communicable diseases, conditions or events that include national or local priorities such as acute outbreaks and deaths or events associated with human, animal and/or environmental health which might have direct consequences for 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:

- Community members report unusual events or occurrences at local level to the health facility, such as a cluster of deaths or an unusual disease pattern, or perhaps a school might report unusual absences due to similar signs and symptoms such as an influenza-like illness (ILI).
- A person falls ill and seeks treatment from a health facility.
- High rate of hospital admission for the same diseases or symptoms.
- A pharmacy reporting an increase in the use of a particular medication or treatment. observed adverse events/reactions to a number of medicines over time.
- Observed adverse events/reactions to a number of medicines over time reported by the healthcare worker.
- Health workers searching for diseases during a routine active case search may find another priority disease that has not yet been reported. For example, an officer who normally reviews the clinic register for cases of Acute Flaccid Paralysis (AFP) may observe that a case of Cholera has also recently been recorded in the clinic register.

- Health workers conduct routine record reviews of the laboratory register and observe recorded confirmed cases of priority diseases such as Yellow Fever or Cholera.
- Radio, television, newspapers, or social media (WhatsApp, Facebook, Twitter etc.) report a rumour of rare or unexplained events in a particular area.
- Vital events records show an increase in maternal deaths.
- Unusual reports of illness among healthcare workers.
- During analysis of the routine reports from all the facilities in the area, the district health information systems/ disease surveillance focal person notices that other health facilities in the catchment area have also reported adult deaths due to bloody diarrhoea, which might signify an outbreak of *Bacillary dysenteriae* or *Escherichia coli*.
- 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 with the same signs in a specific catchment area.
- During an assessment of water bodies, environmental officers observe contamination of water by chemicals like lead, or other related chemicals which could be to the result of nearby mining activities or other activities, and which might be an early trigger for public health action.

1.2 IBS and EBS approaches used to detect diseases, conditions and events

- The IDSR strategy uses both IBS and EBS approaches to detect diseases, conditions, and events.
- As part of its efforts to increase the sensitivity of the surveillance system, an EBS system alongside IBS should be established at all levels of the health system i.e., at national, regional, district, health facility and community levels.
- The IBS involves the use of SCDs to identify diseases, conditions, and events, whilst EBS uses alert detection, triaging and verification to detect events.
  - In contrast to 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 are classified as events.
- IBS and EBS are integral components of the routine IDSR activities of the surveillance staff.
- Both IBS and EBS should use existing resources and infrastructure set aside for routine IDSR strategy.

1.3 Use Standard Case Definitions (SCDs)

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

Why do we need case definitions?

- To help decide if a person has a presumed disease, condition or event, or to exclude other potential disease diagnoses.
- To ensure that every case is diagnosed in the same way, regardless of where or when it occurred, or who identified it.
- To initiate quick action for reporting and investigation, in cases where the clinical diagnosis takes longer to confirm.
- To compare the number of cases of the diseases, conditions or events that occurred in one place or time, with the number occurring in another place or time.

Using standard case definitions is also important in implementing the IHR (2005). Health workers (human, animal, environment) at all levels, including community level, must be aware of case definitions of diseases, condition or events that may afflict not only the local community but also have the potential for spreading across geographic boundaries.

In describing SCDs at health facility level, a three-tiered classification system is normally used:

- **Suspected,**
- **Probable/Compatible, and**
- **Confirmed.**

1. **Suspected case:** indicative clinical picture i.e., patient will have fewer or atypical clinical features without being a confirmed or a probable case.
2. **Probable/ Compatible case:** clear clinical picture (meets the clinical case definition) i.e., patient will have typical clinical features of the illness but a laboratory sample cannot be taken because the case cannot be traced or the person has died; or a sample has been taken but is not available for laboratory testing or was not viable for sufficient laboratory testing; or is linked epidemiologically to a confirmed case and a sample could not be taken.
3. **Confirmed case:** a suspected or probable case verified by laboratory analysis.

NOTE: The classification might vary according to the epidemiology of individual diseases.

In all outbreak scenarios, a more sensitive case definition to identify all suspected cases should always 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. See Introduction chapter for the description of Syndromic Surveillance. If, in the middle of an outbreak, the causative agent has been established, cases may continue to be classified as either suspected cases or confirmed cases. An additional tier of classification i.e. *"Probable/compatible 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 (e.g., Measles) is unnecessary.

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 (lay case definitions) to help the community to recognize when they should refer a person with these signs and symptoms for treatment and notify the health facility.

See Annex 1B at the end of this section for examples of how key signs and symptoms of community case definitions may be described.

1.3.1 One Health approach in identification of events

One Health aims at applying a holistic approach for 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 a multi-sectoral approach across community, district, region and national levels to strengthen collaboration and jointly share the responsibility of detecting events which might have an impact on the health of humans, and their shared environment.

Examples of the One Health approach include for example, detection of a rabid animal or reports of animal illness from the veterinary sector in a specific area, which can then facilitate investigations of human cases of disease or reports of human diseases in the same area, and which can be traced to possible exposure to chemical hazards within the environment. The animal-human-environment interface is linked in this way.

Detection of events at PoE also requires a One Health approach and this requires involvement of all relevant sectors responsible for health, agriculture, livestock, environment, immigration, safety and defence.

1.3.2 Distribute standard case definitions and registers to health facilities

Health facility personnel at all levels, including PoE, must have knowledge of, and have available, SCDs - including those for reporting unusual events, disease patterns, or unexplained deaths - as specified by the national level.

Namibia has prepared and disseminated case definitions for diseases under surveillance in the form of posters, leaflets, and other documentation. These tools reinforce the use of SCDs for detecting and reporting priority diseases, conditions and events.

All health facility personnel need to know the process for recording and reporting, including reporting sites. It is important that health facilities also record rumours. The registers which are normally used for this purpose are the OPD/IPD registers. Health workers should at all times liaise with the health information or surveillance focal person to extract the priority disease of IDSR from the register.

See Annex 1A at the end of this section, and Section 11 of these guidelines for proposed case definitions based on established disease-specific programs.

1.3.3 Distribute lay case definitions to community using key signs and symptoms

Provide information to CHWs, traditional healers, community leaders and community volunteers on how to recognize and report priority diseases, conditions or events to the health facility. The case definitions for community level should be simplified. Emphasize the need to refer people with suspected diseases or conditions for treatment. Provide them with skills for reporting, including when and where to report, and ensure that the necessary tools are also provided. Simplified community alert forms should be designed for reporting events and diseases. Provide information to the community on priority diseases using posters, newsletters and announcements during meetings. In addition, strengthen feedback mechanisms.

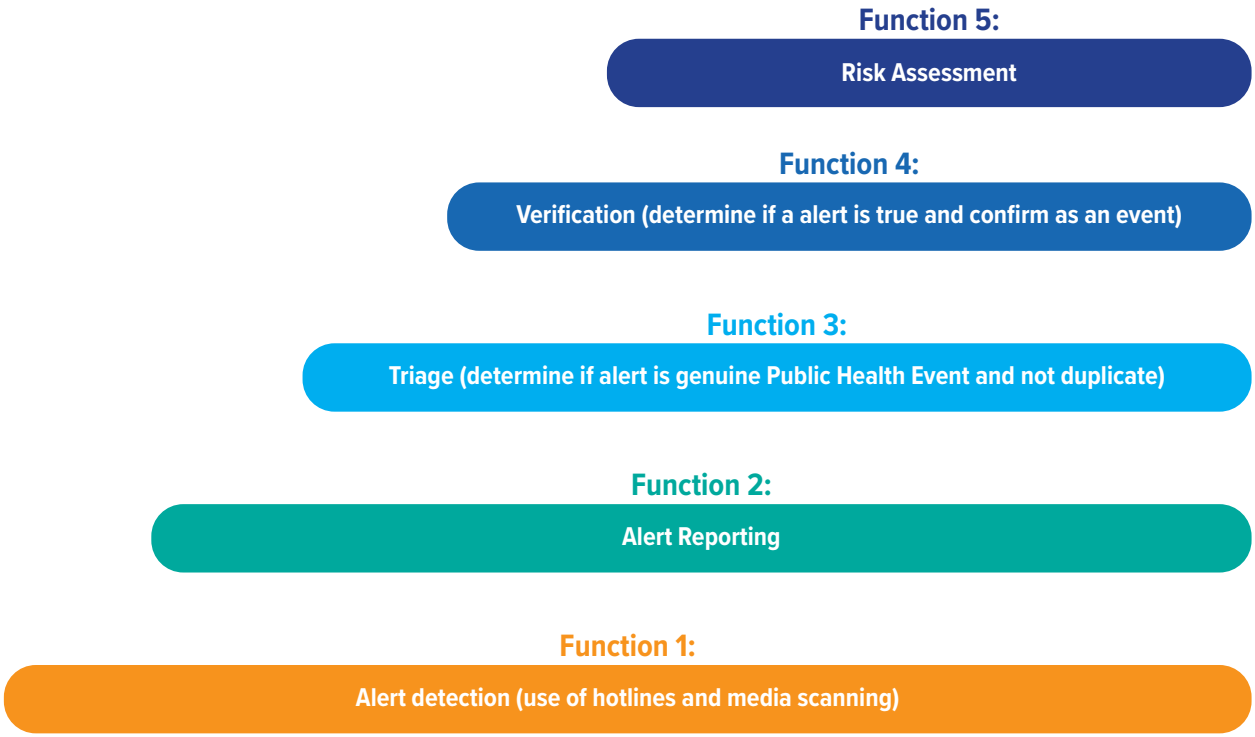
See Annex 1B at the end of this section for a list of examples of case definitions for use at the community level.

1.4 Establish EBS at all levels

MoHSS should ensure that an EBS system is established at all levels of the health system, alongside the Indicator-Based Surveillance (IBS).

The establishment of EBS involves taking into consideration its functions, as illustrated in Figure 1 on page 77, opposite.

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



The following steps are followed in establishing and monitoring an EBS system:

- Step 1: Establish hotlines and media scanning for alert detection
- Step 2: Alerts detection
- Step 3: Registration of alerts
- Step 4: Conduct triaging of alerts
- Step 5: Conduct verification of alerts
- Step 6: Conduct risk assessment and characterization.

See Annex 1C at the end of this section for the steps to establishing EBS at national, regional, district and health facility level.

1.5 Update district procedures for surveillance and response

National, regional and district health officials should work together to update and adjust procedures for surveillance and response annually.

1.5.1 Update the description of the catchment area

Information about the catchment area should be updated at least once a year (health facilities, PoE, laboratories). This activity should be part of the health planning at district, regional as well as national level. Ensure that there is a description of 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 chemical, zoonotic, radiological and nuclear. It is important to also 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. (See *Strategic Tool for Assessing Risks* (STAR), WHO, Draft Version, 3.3.1, December 2019)

Examples of potential risks include sources of contaminated water, lack of urgent transportation to a referral facility for women in labour, or potential hazards such as inadequate safety precautions in mining, or occupational sites and 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:

- The size of key target populations at all levels, such as children under 5 years of age, school-aged children, women of childbearing age, all children and adults from ages one to 30, people living in refugee settlements, Internally Displaced Persons (IDP), out of school youth, and other vulnerable groups.
- Major public health activities in the area, including public, private, and non-governmental organizations (NGOs), immunization activities, clean water projects, family planning clinics, feeding centres for malnourished children, refugee camp health activities, information related to risk factors for NCDs etc.

In updating the district profile, several methods can be used, such as the creation of a forum with key health stakeholders at all levels, which can meet monthly or quarterly. Use this opportunity to provide feedback on surveillance data reported from different institutions in the district. Involve officials from other relevant sectors in the forum to address health matters using the One Health approach.

1.5.2 Mechanism of reporting

Identify all health facilities, laboratories, PoE, private facilities, NGOs/FBOs, community focal points and any other relevant sites in the country, required to report surveillance data or events to the next level. In addition, identify focal persons (FPs) from these sites.

Continuously monitor the capacity of the identified FPs and ensure that the list is updated frequently to accommodate new people.

See Annex 1C at the end of this section for a sample worksheet for listing the reporting sites and contact FPs at each site.

1.5.3 Engaging potential community representatives in surveillance

Community-Based Surveillance (CBS) FPs should be selected and accepted by the community to improve their sense of ownership and empowerment. FPs could also be respected non-health persons such as community leaders (religious, traditional or political), school teachers, veterinarians, agricultural extension workers, or traditional healers etc.

1.5.4 Availability of data collection and reporting tools

In order to have an adequate supply of surveillance reporting tools (forms, line list, registers or other means for reporting surveillance data to the district), review the catchment area population annually. Ensure that revised and updated forms are shared. Ensure that an inventory of all information to assist in the necessary follow-ups, is kept and updated.

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 to others. 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 (e.g., Scarlet Fever, Rubella).

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

- Accurately confirm the diagnosis in an individual patient, and
- Verify the cause (or aetiology) of a suspected outbreak.

1.6.1 Specimen collection, storage and transportation

The type of specimen collected and its packaging (transport media) depends on the suspected disease. Specimens should be collected in adequate quantity into appropriate containers at the health facility level or, if necessary, in the field during an outbreak investigation. All specimens should be packaged properly, labelled correctly and accompanied with the correct laboratory forms, to arrive at the laboratory in good condition, in order to provide reliable results. Minimize delays between collection of the specimen and processing in the laboratory.

Ensure health facilities have trained personnel, equipment, as well as adequate reagents and consumables to enable sample collection. A clearly defined transportation process is required to enable health facilities to understand where to send the samples.

Many factors can affect the reliability of interpretation of laboratory test results.

For example, results are difficult to interpret when:

- Specimens are collected inappropriately, for example, a blood specimen has haemolysed;
- Delay in transportation and or processing may result in bacterial contaminant in a collected specimen such as urine;
- Use of wrong transport or storage media or container may cause reduced viability of the suspected organism;
- Person is given antibiotics before specimen for cultures are collected; and
- Use of the wrong temperature for storage of specimen.
- Collection of the wrong specimen.

The disease-specific reference tables in Part II: Section 11 include the recommended laboratory procedures for confirming priority diseases and conditions, including:

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

It is necessary to initiate public health measures even before laboratory confirmation has been received. It should be noted that the patient should be contained, 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 laboratory FPs at each level of the health system should maintain an updated list of the laboratories that have the capacity to perform required laboratory testing.

See Annex 1F at the end of this section for a sample worksheet for listing national laboratories for confirming priority diseases and conditions.

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 policies and guidelines.

At health facility, district and regional health system levels, the focus is on the safe collection, handling, transportation and processing of specimens, as well as giving prompt feedback. The local surveillance or laboratory FP should establish or strengthen routine communication with identified laboratories that receive specimens from the health facility or district. The purpose of this routine contact is to strengthen communication between health facilities in the district that will be sending specimens, and the laboratory that will be receiving them. Develop procedures so that each entity understands their roles and responsibilities. Ensure that the procedures for specimen collection, transportation, confirming the disease or condition through laboratory testing, and reporting the results, are clear and can be reliably carried out.

To support regional or district level laboratories within the network, the national level health authority will establish a Memorandum of Understanding (MoU) with laboratories outside the country that have the capacity for specific diagnostic procedures not available locally. The national level should support the laboratory through advocacy with high-level decision makers, in putting mechanisms and structures in place to enable the rapid procurement and access to the necessary supplies to collect, handle, store, and ship specimens safely through the network.

In addition, it is crucial to improve collaboration between human, veterinary, and other relevant public health laboratories in line with the One Health approach.

1.6.3 Supply inventory management

Surveillance teams should actively work with the laboratories to maintain and update the list of supplies, reagents and equipment within each laboratory, to avoid duplication. This should be done with both public and private facilities in order to obtain a comprehensive inventory. The inventory should also consist of telephone numbers of aboratory FPs.

1.6.4 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 FP should be identified at all levels. Each laboratory FP should make sure that laboratory protocols and guidelines procedures are followed at their assigned level.

See Annex 1E at the end of this section for roles and responsibilities of laboratory FPs at all levels.

1.6.5 Laboratory quality control and assurance programme

Quality control and assurance in the laboratory are important for building confidence in the results obtained. Establishing or strengthening quality assurance programmes will allow for improvement in the reliability and reproducibility of laboratory results. Coordinate with regional 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 each laboratory has up-to-date, written SOPs for all tests performed in the laboratory. These procedures should be standardized throughout the country's lab network. These SOPs should also incorporate internal quality controls. In addition, the laboratory should participate in quality assurance programs and take corrective action based on sub-standard/poor results, 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.

Guidance on how to do SLIPTA assessment can be found in the WHO *Stepwise Laboratory Quality Improvement Process towards Accreditation (SLIPTA)* [Checklist Version 2:2015 for Clinical and Public Health Laboratories], and at: http://apps.who.int/iris/handle/10665/204423.

Annexes to Section 1

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Annex 1A: Standard case definitions for reporting suspected priority diseases, conditions and events, from the health facility to the district

It is recommended that health facilities use the following SCDs for reporting suspected cases of priority diseases and conditions to the district level. Please refer to the disease-specific guidelines in Part II: Section 11 for additional information on each of the priority diseases targeted for surveillance, and which action to take, in response to alert and epidemic thresholds.

! NOTE: These case definitions may change based on new knowledge.

Priority Diseases and Conditions: Standard Case Definitions (SCDs)

Acute Haemorrhagic Fever Syndrome

Suspected case: Acute onset of fever of less than 3 weeks duration in a severely ill patient/ or a dead person **AND** any two (2) of the following; haemorrhagic or purpuric rash; epistaxis (nose bleed); haematemesis (blood in vomit); haemoptysis (blood in sputum); blood in stool; other haemorrhagic symptoms and no known predisposing factors for haemorrhagic manifestations OR clinical suspicion of any of the viral diseases.
Confirmed case: A suspected case with laboratory confirmation or an epidemiologic link to confirmed cases or outbreak.
Probable case: A suspected case with an epidemiologic link to confirmed cases or outbreak, but laboratory specimens are not available or are awaited.
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, and a proper history-taking is crucial.

Acute Jaundice Syndrome

Acute onset of jaundice, with or without fever, and absence of any known precipitating factors. The jaundice usually persists for 1 to 6 weeks, and then gradually resolves.

Acute and Chronic Viral Hepatitis

I. 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 the abdomen),
AND/OR
(iii) Raised alanine aminotransferase (ALT) levels - more than ten times the upper limit of normal.
Note: Infected children are often asymptomatic
Confirmed case: A suspected case that is laboratory confirmed by virus specific biomarkers:

- **Acute Hepatitis A:** anti-HAV IgM positive or positive for HAV RNA
- **Acute Hepatitis B:** Hepatitis B surface antigen (HBsAg) positive AND anti-hepatitis B core antigen (anti-HBc) IgM positive, or HBV DNA positive
- **Acute Hepatitis C:** HCV RNA positive (Viral Load), HCV core antigen positive (where available) and anti-HCV IgM positive. Markers of acute hepatitis A (anti-HAV IgM) and hepatitis E (anti-HEV IgM) are negative.
- **Acute Hepatitis D:** HBsAg positive (or anti-HBc IgM positive) plus anti-HDV positive (usually IgM), and HDV RNA (HDV infection ONLY occurs as co-infection or super-infection of hepatitis B)

- **Acute Hepatitis E:** anti-HEV IgM positive.

II. 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 HBV infection
- Anti-HBc positive (usually IgG).

Chronic Hepatitis C:

- Hepatitis C virus RNA positive in a person with anti-HCV positive (usually IgG)
- 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.

Adverse Drug Reactions (ADR)

Adverse Drug Reaction: A response to a drug which is noxious and unintended, and which occurs at doses normally used in humans for the prophylaxis, diagnosis, or therapy of disease, or for the modifications of physiological function.
Adverse event: A medical occurrence associated with the use of a medicinal product, but not necessarily causally related (temporally).
Side effect: An unintended effect occurring at normal dose, related to the pharmacological properties.

Adverse Event Following Immunization (AEFI)

Any untoward medical occurrence which follows immunization, and which does not necessarily have a causal relationship with the usage of the vaccine. The adverse event may be any unfavourable or unintended sign, abnormal laboratory finding, symptom or disease.
Suspected case: Any person with acute onset characterized by several clinical forms which are:

1. **Cutaneous form:** Any person with skin lesion evolving over 1 to 6 days from a popular through a vesicular stage, to a depressed black eschar, invariably accompanied by oedema that may be mild to extensive.
2. **Gastro-intestinal:** Any person with abdominal distress characterized by nausea, vomiting, anorexia and followed by fever.
3. **Pulmonary (inhalation):** any person with brief prodromal resembling acute viral respiratory illness, followed by rapid onset of hypoxia, dyspnoea and high temperature, with X-ray evidence of mediastinal widening.
4. **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.

Anthrax (Human)

Confirmed case: A confirmed case of Anthrax in a human can be defined as a clinically suspected case of cutaneous, inhalational or gastrointestinal illness that is laboratory-confirmed by:

- Isolation of *B. anthracis* from an affected tissue or site; or
- 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.

Antimicrobial Resistance

Clinicians at the participating healthcare facilities will send a sample for culture and Antimicrobial Sensitivity Testing (AST) from patients with suspected infection to the laboratory serving the surveillance site, by using the standard form. The AST is usually performed locally at district level. However, samples for AST may be sent to a reference laboratory. The minimum core patient data that should accompany any request for AST are: age, gender, specimen type, date of sampling.

Cases will be detected from the results of AST of specimens sent to surveillance laboratories, and core clinical information. Resistance will occur when a known bacterium survives exposure to a defined concentration of an antimicrobial substance. Antimicrobial Resistance (AMR) can be detected only by microbiological methods. Therefore, samples must be taken from patients for species identification and AST. AST results will then be reported as susceptible, intermediate, or resistant, or not done/ not applicable.

Bacterial Meningitis

Suspected case: Any person with sudden onset of fever (>38.5°C rectal or 38°C axillary), and neck stiffness or other meningeal signs (headache, altered consciousness, confusion, irritability), including bulging fontanelle and vomiting in infants.
Probable case: Any suspected case with macroscopic aspect of cerebrospinal fluid (CSF) turbid, cloudy or purulent; or with a CSF leukocyte count >10 cells/mm3 or with bacteria identified by Gram stain in CSF; or positive antigen detection (for example, by latex agglutination testing) in CSF.
In infants: CSF leucocyte count >100 cells/mm3; or CSF leucocyte count 10–100 cells/mm3 and either an elevated protein (>100 mg/dl) or decreased glucose (<40 mg/dl) level.
Confirmed case: Any suspected or probable case that is laboratory-confirmed by culturing or identifying (i.e. polymerase chain reaction) a bacterial pathogen (Neisseria meningitidis, Streptococcus pneumoniae, Haemophilus Influenza type b) in the CSF or blood.

Cholera

Suspected 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 polymerase chain reaction (PCR).

Coronavirus Disease (COVID-19)

Suspected case of SARS is an individual with:
Clinical criteria:

1. Acute onset fever,(≥ 38°C) and cough (Influenza-like Illness (ILI)); **OR**
2. Acute onset of any three or more of the following signs or symptoms: fever, cough, general body weakness/ fatique, headache, myalgia, sore throat, coryza, dyspnoea, nausea, diarrhoea, or anorexia.

Epidemiological criteria:

1. Contact of a probable or confirmed case, or linked to a COVID-19 cluster; **OR**
2. A patient with Severe Acute Respiratory Illness (SARI): acute respiratory infection with history of fever or measured fever of ≥ 38C°; and cough; with onset within the last 10 days; and who requires hospitalization.

Confirmed case:

1. A person with a positive Nucleic Acid Amplification Test (NAAT), regardless of clinical criteria or epidemiological criteria; **OR**
2. A person meeting clinical criteria **AND/OR** epidemiological criteria with a positive professional use, or self-test SARS-CoV-2 antigen-RDT.

Crimean-Congo Haemorrhagic Fevers (CCHF) and Lassa Fever

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 exanthema 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 an epidemiologic link to confirmed cases or outbreak.

Suspected case of Lassa Fever: Illness with gradual onset with one or more of the following: malaise, fever, headache, sore throat, cough, nausea, vomiting, diarrhoea, myalgia, chest pain hearing loss and a history of contact with excreta of rodents or with a case of Lassa Fever.

Confirmed case of Lassa Fever: A suspected case that is laboratory confirmed (positive IgM antibody, PCR or virus isolation) or epidemiologically linked to a laboratory-confirmed case.

Dengue Fever

Suspected case: Any person with acute febrile illness of 2 to 7 days duration, with 2 or more of the following: headache, retro-orbital pain, myalgia, arthralgia, rash, haemorrhagic manifestations, leucopenia.

Confirmed case: A suspected case with laboratory confirmation (positive IgM antibody, fourfold or greater increase in IgG antibody titers in paired (acute and convalescent) serum specimens, positive PCR or Isolation of the Dengue virus using cell culture).

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 of the above criteria, plus evidence of circulatory failure manifested by rapid and weak pulse, and narrow pulse pressure (≤ 20mm Hg) or hypotension for age, cold, clammy skin and altered mental status.

Diabetes Mellitus (new case) (DM)

Suspected case: Any person presenting with the following symptoms:

- Increased thirst,
- Increased hunger,
- Frequent urination.

Confirmed 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 ≥ 6.1 mmol/L (110 mg/dl),

OR

Any person with a non-fasting glucose ≥ 11.1 mmol/L (200mg/dl) Or venous plasma glucose measurement of ≥ 11.1mmol/L (200 mg/dl).

***Report only the first lab-confirmed**

Diarrhoea with blood (Shigella)

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* type 1.

Diarrhoea with dehydration in children less than 5 years of age

Suspected case: Passage of three 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/suck or drinking/sucking 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.

Dracunculiasis (Guinea Worm Disease)

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 for Guinea Worm, with the emergence of a worm.
Confirmed case: A person exhibiting a skin lesion with emergence of a Guinea worm, and in which the worm is confirmed in laboratory tests to be *D. medinensis*. That person is counted as a case only once during the calendar year, i.e., when the first worm emerges from that person. All worm specimens should be obtained from each case patient for laboratory confirmation and sent to the reference lab for confirmation. All cases should be monitored at least twice per month during the remainder of the calendar year for prompt detection of possible emergence of additional Guinea worms.

Ebola or Marburg Virus Diseases

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), blood in urine and bleeding eyes.
Confirmed case: A suspected case with laboratory confirmation (positive IgM antibody, positive PCR or viral isolation), or epidemiologic link to confirmed cases or outbreak.
In outbreak setting, the following SCDs 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, diarrhoea, hiccups; **OR**
- Any person with unexplainable bleeding; **OR**
- Any sudden, unexplainable death;

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 probable 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.

Epilepsy

Suspected case: Any person with one epileptic seizure

Confirmed case: Any person with recurrence of, at least two epileptic seizures. A positive response to treatment with any Anti-Epileptic Drug (AED) strengthens the hypothesis of a confirmed case. Epileptic seizures can last for 30 seconds to 3 minutes. When they intricate without a pause, they can lead to *status epilepticus*.

Foodborne Illnesses

Suspected case: 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 (e.g., Cholera, Hepatitis A, Salmonellosis, Shigellosis).

Confirmed case: A laboratory-confirmed case of a specific agent, with a link to a common food or drink source.

Human Influenza caused by a new subtype

Suspected H5N1 case: Any person presenting with unexplained acute lower respiratory illness with fever (>38ºC) and cough, shortness of breath **OR**

difficulty breathing **AND**

one or more of the following exposures within the 7 days prior to symptom onset:

a. Close contact (within 1 meter) with a person (e.g. caring for, speaking with, or touching) who is a suspected, probable, or confirmed H5N1 case;
b. Exposure to poultry or wild birds (e.g., handling, slaughtering, de-feathering, butchering, preparing for consumption), or their remains, or to environments contaminated by their faeces in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month;
c. Consumption of raw or undercooked poultry products in an area where H5N1 infections in animals or humans have been suspected or confirmed in the last month;
d. Close contact with a confirmed H5N1 infected animal other than poultry or wild birds; **OR**
e. Handling samples (animal or human) suspected of containing H5N1 virus in a laboratory or other setting.

Confirmed H5N1 case: A person meeting the criteria for a suspected case **AND** positive laboratory results from a laboratory, whose H5N1 test results are accepted by WHO as confirmatory.

NB: Include IHR case definition for reporting of human infection with a novel influenza virus.

For some zoonotic influenza subtypes, specific case definitions exist, such as for H5N1 and H7N9.

Hypertension (new case)

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 140mm Hg for systolic pressure, or greater than or equal to 90mm Hg for diastolic pressure.

Confirmed case: Any individual presenting on at least two occasions with a resting blood pressure measurement (based on the average of 3 readings) at, or above, 140 mm Hg for systolic pressure, or greater than, or equal to 90 mm Hg, for diastolic pressure.

Influenza-like Illness (ILI)

An acute respiratory infection in a child or adult with:

- Sudden onset of fever > 38°C **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).

* **Report only the first diagnostic of the case in the health centre**

Injuries (Road Traffic Accidents)

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 a crash injury.

Leprosy

Suspected case: A person showing one of three cardinal signs of leprosy: hypo-pigmented or reddish skin lesion, loss or decrease of sensations, skin patch, enlargement of peripheral nerve.

Confirmed case: A person showing at least two cardinal signs of leprosy and who has not completed a full course of treatment with Multi-Drug Therapy (MDT).

Malaria

Uncomplicated Malaria: Any person living in area at risk of Malaria with fever or history of fever within 24 hours; without signs of severe disease (vital organ dysfunction) is diagnosed clinically as Malaria.

Confirmed Uncomplicated Malaria: Any person with fever or history of fever within 24 hours; and with laboratory confirmation of diagnosis by Malaria blood film or other diagnostic test for Malaria parasites.

Unconfirmed Severe Malaria: Any patient living in area at risk of Malaria hospitalised with severe febrile disease with accompanying vital organ dysfunction diagnosed clinically.

Confirmed Severe Malaria: Any patient hospitalized with *P. falciparum* asexual parasitaemia as confirmed by laboratory tests with accompanying symptoms and signs of severe disease (vital organ dysfunction) diagnosed through laboratory.

Malnutrition

Low birth weight new-borns: Any newborn 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 Z Score)
- Children 6 to 59 months with MUAC<11.5 cm (high risk of mortality)
- Bilateral pitting oedema.

Malnutrition in pregnant women: Pregnant women who have given birth to low birth weight babies (birth weight < 2.5 Kg). (Poor nutritional and health status of the women, can predict which population groups may benefit from improved antenatal care of women and neonatal care for infants).

Maternal Deaths

The death of a woman while pregnant or within 42 days of the delivery or termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.

Measles

Suspected case: Any person with fever and maculopapular (non-vesicular) generalized rash and cough, coryza or conjunctivitis (red eyes), or any person in whom a clinician suspects Measles.
Confirmed case: A suspected case with laboratory confirmation (positive IgM antibody) or an epidemiological link to confirmed cases in an outbreak.

Monkeypox Disease

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.

Neonatal and Non-Neonatal Tetanus

Suspected case: Neonatal Tetanus - Any newborn with a normal ability to suck and cry during the first two days of life, and who, between the 3rd and 28th day of age, cannot suck normally, and becomes stiff or has convulsions or both.
Suspected case: Non-Neonatal Tetanus - Any newborn > 28 days of age with acute onset of one of the following: lockjaw, sustained spasm of the facial muscles, or generalized muscle spasms.
Confirmed case: No laboratory confirmation recommended.

New HIV/AIDS Cases

A new HIV positive case, confirmed as per the National Guidelines on HIV Testing Services.

Perinatal (Stillbirths and Neonatal) Deaths

A **perinatal death** is defined as the death of a baby of at least 28 weeks of gestation and/or 1000 gram 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 1,000gram birthweight and/or at least 28 weeks gestation and 35cm 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.

Plague

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 previous 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.

Poliomyelitis (Acute Flaccid Paralysis, AFP))

Suspected case: Any child under 15 years of age with Acute Flaccid Paralysis (sudden onset of weakness/floppiness of limbs) or any person with paralytic illness at any age in whom the clinician suspects poliomyelitis.
Confirmed case: A suspected case with polio virus isolation in stool.

Rabies (Human)

Suspected case: A person with one or more of the following: headache, neck pain, nausea, fever, fear of water (hydrophobia), anxiety, agitation, abnormal tingling sensations or pain at the wound site, when contact with a rabid animal is suspected.
Confirmed case: A suspected case that is laboratory-confirmed.

Rift Valley Fever (RVF)

Suspected case: Early disease -
Acute febrile illness (axillary temperature >37.5 °C or oral temperature of >38°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 A**ND / OR:**
Abrupt onset of any one 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 evidenced by presence of small skin and mucous membrane haemorrhages (petechiae) (or platelet count < 100x109 / dL)
- Evidence of kidney failure (oedema, 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-encephalitis, 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).

Scabies

Suspected case: A person showing one of the following:

- Typical lesions in a typical distribution, **PLUS** either itch or close contact with an individual who has itch **OR** typical lesions in a typical distribution, **OR**
- Atypical lesions or atypical distribution plus itch and close contact with an individual who has itch or typical lesions in a typical distribution.

Confirmed case: A suspected case with at least one of the following:

- Mites, eggs or faeces on light microscopy of skin samples.
- Mites, eggs or faeces visualised on individual using a high-powered imaging device.

Schistosomiasis

Urinary schistosomiasis:
Endemic areas (moderate or high prevalence):
Suspected case: Not applicable
Confirmed case: A case with visible haematuria or with positive reagent strip for haematuria or with eggs of *S. haematobium* in urine (microscopy.)

Non-endemic areas and areas of low prevalence:
Suspected case: A person with visible haematuria or with positive reagent strip for haematuria.
Confirmed case: A person with eggs of *S.haematuria* in urine (microscopic).

Intestinal schistosomiasis:
Endemic areas (moderate or high prevalence):
Suspected case: A person with Chronic or recurrent intestinal symptoms (blood in stool, bloody diarrhoea, diarrhoea, abdominal pains) at a later stage hepatosplenomegaly.
Confirmed case: A person with eggs of *S.mansoni* in stools (microscopy.)

Non-endemic areas and areas of low prevalence:
Suspected case: A person with chronic or recurrent intestinal symptoms (blood in stool, bloody diarrhoea, diarrhoea, abdominal pains) or at a later stage hepatosplenomgaly.
Confirmed case: A person with eggs of *S. mansoni* in stools (microscopy), a person with positive reaction to immunoblot test.

Severe Acute Respiratory Infections (SARIs)

Severe Acute Respiratory Infection (persons ≥ 5 years old): Any severely ill person presenting with manifestations of acute lower respiratory infection with:

- Sudden onset of fever (>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.

Severe Acute Respiratory Syndrome (SARS)

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

Severe Pneumonia in children under 5

Clinical case definition (IMCI) for pneumonia:
A child presenting with cough or difficulty breathing, **AND:**

- 50 or more breaths per minute for infant age 2 months up to 1 year, or
- 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 for severe pneumonia:
A child presenting with cough or difficulty breathing and any general danger sign, or chest in-drawing or stridor in a calm child. General danger signs for children 2 months to 5 years are: unable to drink or breast feed, vomits everything, convulsions, lethargy, or unconsciousness.
Confirmed case: Radiographic or laboratory confirmation of pneumonia may not be feasible in most districts.

Sexually Transmitted Infections (STIs)

Genital Ulcer Syndrome (Non-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: A suspected case confirmed by a laboratory method (e.g., Gram stain showing intracellular Gram-negative diplococci).

Smallpox (Variola)

Suspected case: An illness with acute onset of fever > 38.3°C (101°F) followed by a rash characterized by vesicles or firm pustules in the same stage of development without other apparent cause.
Probable case: A case that meets the clinical case definition, is not laboratory-confirmed, but has an epidemiological link to a confirmed or probable case.
Confirmed case: A clinically compatible case that is laboratory-confirmed.

Snakebite Envenoming

Suspected case: There is no standard case definition.
However, any person with history of been bitten by a snake and presenting with the following manifestations:
Early signs and symptoms: Pain, swelling, redness, bleeding or blistering around the bite area, bruising, fast heart rate, and nausea.

Later signs and symptoms may include the following: Marked increases or spreading of swelling, spreading of discoloration, neurotoxic (drooling, slurred speech, disturbed vision), difficulty in breathing, mental confusion, or sweating.

Soil Transmitted Helminths Infestations (STH)

Suspected case: No case definition of suspected case.
Probable case: No case definition of probable case.
Confirmed case: A case with *Ascaris lumbricoides*, *Trichuris trichiura* or hookworms, confirmed by microscopy or other more sensitive methods such as RT-PCR (if available).

Taenia Solium Taeniasis and Cysticercosis

Suspected case: N/A (no specific symptoms to define suspected cases).
Probable case of Taeniasis: Reliable history of self-diagnosis by finding or reporting expelled tapeworm proglottids (species non-specific).
Confirmed case of Taeniasis: Laboratory-based diagnosis of Taeniasis without species identification.
Confirmed case of *T. solium* Taeniasis: Confirmed case of Taeniasis with species identification of *T. solium.*
Neurocysticercosis: Chronic headaches, blindness, seizures, hydrocephalus, meningitis, and symptoms caused by lesions occupying spaces of the central nervous system confirmed, or with neuroimaging.

Trachoma

Suspected case: Any patient with red sticky eyes, who complains of pain and itchiness of the eyes.
Confirmed case: Any patient with red sticky eyes, who complains of pain and itchiness of the eyes, where examination of the eyes confirms one of the stages of Trachoma infection, according to the WHO Simplified Trachoma Grading System.

Trypanosomiasis

Suspected case: Early stage - a painful chancre, originating as a papule and then evolving into a nodule at the primary fly bite site. There may be fever, intense headache, insomnia, painless lymphadenopathy, anaemia, local oedema and rash.
Late stage - cachexia, somnolence, and central nervous system signs.
Confirmed case: A suspected case confirmed by card agglutination trypanosomal test (CATT), or by isolation of trypanosomes in blood lymph nodes or cerebrospinal fluid.

Tuberculosis (TB)

Suspected case: Any person with a cough of 2 weeks or more.
Confirmed case: Bacteriologically confirmed. TB - a biological specimen is positive by smear microscopy, culture or rapid molecular test such as Xpert MTB/RIF, line probe assays or other PCR- based methods. Bacteriologically confirmed cases can be subdivided further into:

- **Rifampicin susceptible (sensitive) cases:** where Xpert MTB/RIF or other test has confirmed MTB but failed to detect resistance.
- **Rifampicin resistant cases:** where a molecular test (such as Xpert) or phenotypic test has detected
- resistance to rifampicin.

Clinically diagnosed case of TB: which there is no bacteriological confirmation but has been diagnosed with active TB by a medical practitioner. This definition includes cases in which specimens taken were bacteriologically negative, or cases diagnosed by radiology (x-rays), or those diagnosed by histopathology, where the pathologist has failed to describe presence of TB bacilli. Clinically diagnosed cases can be pulmonary or extrapulmonary. Clinically diagnosed cases of pulmonary TB can either be:

- **Bacteriologically negative:** where sputum was Xpert MTB/RIF and/or culture negative, yet a clinician decided to treat for TB-based radiological, clinical or other evidence. Where only smear microscopy is available, two negative smears may be considered bacteriologically negative.
- **Sputum not tested:** sputum has not been investigated for TB, yet a clinician decided to treat for TB-based radiological, clinical or other evidence.

Typhoid Fever

Suspected case: Any person with gradual onset of steadily increasing and then persistently high fever, chills, malaise, headache, sore throat, cough, and, sometimes abdominal pain and constipation or diarrhoea.
Confirmed case: Suspected case confirmed by isolation of Salmonella typhi from blood, bone marrow, bowel fluid or stool.

Unexplained Cluster of Health Events or Deaths

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 healthcare 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 patient's 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.

Laboratories

- **The proposed definition for events to be reported by 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)."***

Yaws

Suspected case: A person who presents with papule or ulcer or multiple generalized raised yellow lesions, pain and swelling of long bones and fingers.
Confirmed case: A suspected case that is laboratory-confirmed.

Yellow Fever

Suspected case: Any person with acute onset of fever, with jaundice appearing within 14 days of onset of the first symptoms.
Probable case: A suspected case; **AND** one of the following:

- Epidemiological link to a confirmed case or an outbreak
- Positive post-mortem liver histopathology.

Confirmed case: A probable case; **AND** one of the following:

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

***YF-specific means that antibody tests (such as IgM or neutralizing antibody) for other prevalent flavivirus are negative. This testing should include at least IgM for Dengue and West Nile and may include other flavivirus depending on local epidemiology.**
OR, one of the following:

- Detection of YF virus genome in blood or other organs by PCR
- Detection of YF antigen in blood, liver or other organs by immunoassays isolation of the yellow fever virus.

Zika Virus Disease

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 (commercially available ELISA).

Annex 1B: Community level (lay) case definitions using key signs and symptoms

Community leaders, CHWs, traditional healers, birth attendants, and healthcare workers who conduct outreach activities in hard-to-reach areas, must be informed about the priority diseases and conditions under surveillance in the area. Use simplified key signs and symptoms of case definitions which are easier to understand than the IDSR health facility case definitions listed in Annex 1A.

The following are examples of SCDs which can be used to help the community to recognize the diseases, to refer a person with these signs for treatment, and to notify the local health facility.

Description of key signs and symptoms of lay case definitions

Acute Flaccid Paralysis (AFP)

Any child under 15 years old with a sudden onset of weakness, and /or inability to stand or walk, or use their arm(s) and or leg(s).

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.

Acute Watery Diarrhoea

Any person with 3 or more loose stools within the last 24 hours.

Adverse Event Following Immunization (AEFI)

Any unusual event that follows immunization.

Animal Bite (potential Rabies)

Any person who is bitten by a dog or other mammal.

Coronavirus Disease (COVID-19)

Any person with high fever,(≥ 38°C) and cough (Influenza-like Illness (ILI)).

Diarrhoea in children less than 5 years of age

Any child less than 5 years of age 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 Disease (Dracunculiasis)

Any person presenting with a skin wound, living in an endemic area or risk area of Guinea Worm, with a worm coming out.

Hepatitis

Any person with fever and yellowing of the white part of the eyes.

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

If in an endemic area:
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.

If in a non-endemic area:
Any person who has been exposed to a mosquito bite and a history of fever, or fever in the previous three days.

Maternal Death

The death of a woman while pregnant or died within 42 days after delivery.

Measles

Any person with fever and rash.

Meningitis

Any person with fever and neck stiffness.

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.

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 in children

Any child less than 5 years of age with cough and fast breathing or difficulty in breathing.

Rabies (Human)

Any person with a sense of apprehension, headache, fever, body tiredness and unclear sensory changes, often referred to the site of a preceding animal bite. Nervousness and fear of water are frequent symptoms.

Sexually Transmitted Infections (STIs)

Any person who has a urethral/vaginal discharge or genital sores or pain.

Tuberculosis (TB)

Any person with cough for 3 weeks or more.

Typhoid Fever

Any person with a prolonged fever during the previous 3 weeks or more.

Unusual health events

- Two or more persons presenting with similar severe illnesses in the same setting (e.g., household, workplace, school, street, area) within one week.
- Two or more persons dying in the same community within one week.
- 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 (e.g, 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 (e.g., wedding, funeral, birthday event, festival, shebeen, food market or sellers, etc.)
- Unexpected large numbers of children absent from school due to the same illness.
- Any event in the community that causes public anxiety.

Viral Haemorrhagic Fevers

Any person who has fever and two or more other symptoms (headache, vomiting, yellow eyes, runny stomach, body weakness,) or who died after serious sickness with fever or bleeding.

Yellow Fever

Any person who has fever and two or more other symptoms (headache, vomiting, runny stomach, body weakness, yellow eyes), or who died after serious sickness with fever or bleeding.

Annex 1C: Guide for establishing Event-Based Surveillance (EBS) at national, region, district and health facility levels

Event-Based Surveillance (EBS) is the organized 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 (EWAR) as an alert representing potential acute risk to human health, such as an outbreak. All alerts do not necessarily become real events, and as such they all need to be triaged and verified, before a response is initiated.

EBS provides an opportunity for the early detection of events, leading to timely response. It is therefore mandatory that all countries aim at establishing EBS alongside IBS, at all levels of the health system: national, regional, district, health facility and community.

The required steps for establishing EBS at national, regional, district and health facility levels, are described below.

! NOTE: A description of EBS at community level can be found in the Introduction Section of this guideline.

I) Steps for establishing EBS at national/regional/district levels

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

This step involves two major activities, 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 phone number used 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) A single number that can be used as a hotline is recommended, to make it easy to remember for reporting. 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 0800100100, 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, NGOs, religious and other leaders, or schools and also advertise through messaging in local languages via TV and radio broadcasts and printed in newspapers.
(f) Develop partnerships with communication companies that can spread the hotline number by test 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 a day, 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 caller for their proactivity tin reporting to the MoHSS or relevant ministries hosting the hotline, concerning potential public health events.
(b) The responder should then ask the caller a prepared set of questions, which correspond directly to the questions in the alert register.

(c) The call should be ended by thanking the caller for their time, patience and proactivity.
(d) The responder should directly record the alerts that meet the pre-defined list of alerts, in the alert register.
(e) In situations where a call is interrupted or disconnected for some reason, or if calls are received while the responder is busy, the responder should return the call. 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 them and state that an operator will contact them within 24 hours.
(b) Automated questions or responders can collect information from the sender.
(c Data should be registered directly in the alert register according to the pre-defined list of alerts.
(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.

! NOTE: Hotlines should be established at national, regional and district level.

(a) **At 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.
(b) **At regional and district level:** The hotline can be established at the premises of the Regional Health Authorities, or at the Regional PHEOC if available, to capture and register alerts from the region.
(c) **At district level:** The hotline can be established at the premises of the District Health Authorities to capture and register alerts from the district, including 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. e.g. 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 at national level, however other levels may conduct scanning and share with the national level for coordination.
(d) Train health personnel to conduct media scanning regularly e.g. daily.
(e) The sources of media scanning can be official and non-official:

(i) Official media sources:

- Websites of governmental sectors including, ministries of health and social services, agriculture, water and land reform, environment, forestry, tourism, international relations and cooperation, and mines and energy etc.
- Websites for official organizations such as universities and internationally recognized centres of research;
- WHO official websites for early warning e.g. 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 e.g. AFRO, EMRO, EURO, SEARO, WPRO, PAHO;
- Disease-specific websites e.g. Global Influenza Surveillance and Response;
- Africa CDC Websites;
- National Institute of Communicable Diseases (NICD); and
- Southern African Development Community (SADC).

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

(ii) Unofficial Media sources:

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

! NOTE: 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, as follows:

Manual scanning

(a) Develop a checklist for scheduled review of online sources (e.g. daily).
(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.

Automated scanning

(a) There are multiple automated technological tools that can be used for the scanning of online information from predefined 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 feeds (RSS feeds) are standardized software tools that monitor the pre-defined 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 e.g., ProMed.

Automated information feeds or services developed by governments or international organizations collect health information from several sources, and 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 potential public health events reported to the hotline.
(b) Members of the general public may communicate with the hotline desk through phone calls, SMSs, 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 register.
(f) Alerts can also be detected by media scanning, either manually or automated as described above.
(g) Examples of pre-determined alerts:

CODE	ALERTS TO BE REPORTED
01	Two or more persons presenting with similar severe illness in the same setting (e.g. 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 healthcare 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 which correspond to the pre-defined list of alerts, should be registered in the alert register. (See the Sample Alert register 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:

- **Source/informant:** Name, contact phone number, and time and date of the call/detection.
- **Alert:** when it happened, who was affected (cases, deaths), and where it started and how it spread.
- **Follow-up of the alert**: triage, verification, risk assessment and response.

Sample alert register for hotlines and/or media scanning

ALERT REGISTER 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, HEBS, Media Scanning, Hotline (This can be further categorized)	
(b) Reporter info: Employee at national team, community health volunteer, healthcare 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 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 other)	
3. Follow up activities:	
(a) Follow up: Discard, Monitor, Verify	
Date and Time: (DD/MM/YYYY) (HH:MM)	__ __/__ __/__ __ ____ __ __:__ __
(b) Sent for verification: Yes/No	
Date and Time: (DD/MM/YYYY) (HH:MM)	__ __/__ __/__ __ ____ __ __:__ __
(c) Verified: Yes/No	
Date and Time: (DD/MM/YYYY) (HH:MM)	__ __/__ __/__ __ ____ __ __:__ __
(d) Risk Assessment: Very Low/Low/Moderate/High/Very High	
(e) Sent to Response: Yes/No	
Date and Time: (DD/MM/YYYY) (HH:MM)	__ __/__ __/__ __ ____ __ __:__ __
(f) Response Status: Not started; Ongoing; Completed	
Date and 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, e.g. 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 e.g. 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 national level, this is reported to the respective regional/provincial focal point (Regional Health Team) where the alert is located, by phone call, SMS or email etc.
(d) The Regional Health Team then notifies the respective District Health Team.
(e Trained District Health Team, with support from regional/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 District Health Team, with support from regional/national experts should promptly start investigations by collecting further information in the field (conducting physical examinations, collecting lab samples etc.), using the existing respective IDSR case/event investigation forms.
(i) The confirmed events that meet the SCD should be captured in the IBS system by the respective District Health Team, and reported to the next level of health care system i.e. through the existing IDSR data collection tools and following the IDSR reporting procedures.

See Section 2.

Step 6: Conduct risk assessment and characterization

(a) Once an alert is verified as an event, risk assessment begins.
    (i) 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 region and district health teams.
(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.

See Section 4.

- For alerts that have been substantiated as true events, but do not pose an immediate threat to the public, the team should monitor the event and undertake risk assessments, as and when new information becomes available.

II) Steps for establishing EBS at district level

(a) The steps for establishing EBS at district level is similar to the national level.
(b) District level health authorities however, mostly receive EBS-related information in the form of alerts, from health facilities and communities through phone calls/SMSs/WhatsApp.

- Record verbal or written information received from health facilities and communities about suspected outbreaks, rumours, unexplained events/alerts in the district log of suspected outbreaks. The district health team should carry out the following functions: Triaging, Verification and Risk Assessment.

See Section 4, Annex 4A.

(c) Triage alerts

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

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

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

(iii After triage:

- If the report is not relevant or is a duplicate, it can be discarded. There is no further action that needs to be taken.
- If the information is to be discarded, communicate the following information to the Health Facility EBS (HEBS) focal persons/surveillance focal persons who reported the alert:
  - They should continue to monitor the situation and notify the district if the situation changes and alert is met.
  - Reassure them that even though they have reported an alert that has been determined to be a false alert, 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 district health team that received the information about the alert.

(d) Verify alerts

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

(ii) The district 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 (i.e. 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 o 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 (e.g. veterinarian, physician or lab assistant.

(v) To conduct verification, the district 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 Event-Based Surveillance: Verification Tool below.**

(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 immediately reported to the region.
- If the alert is not considered to be a public health event, the situation will be monitored to ensure it does not become a public health event.

(e) Record confirmed events in existing IDSR data collection tools and platforms, and report to the next level. **See Section 2.**

(f) Conduct Risk Assessment as per the national guidance.

Sample of Event-Based Surveillance: Verification Tool

When an alert is notified by a CBS Focal Person or health facility, District 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? (i.e. 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?

III) Steps for establishing EBS at health facility level

Consider the following important points:

(a) Indicator-Based Surveillance (IBS) in health facilities encompasses immediate, weekly or monthly reporting of pre-determined list of diseases based on case definitions.
(b) Event-Based Surveillance (EBS) in health facilities (HEBS) trains clinicians, nurses, and other relevant health professionals to report on patterns 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 the early detection of diseases, conditions and events.

Step 1: Alert detection

(a) Select and train HEBS FPs: Existing health facility surveillance FPs can be trained to perform this role.
(b) HEBS FPs must advise other staff to immediately notify them, when they see or hear about one of the alerts happening in their workplace.
(c) Healthcare 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 HEBS 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 HEBS focal person/surveillance focal persons in the health facilities who immediately report to the district team.
(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 district health team, upon receipt of the report of alerts, should triage and verify all alerts within 24 hours of alert detection, using the verification tool.
(b) In the case of true events, immediate investigation and response measures are implemented, as per the existing IDSR structures.
(c) The district team should provide regular feedback to the reporting health facilities.

Annex 1D: List of district reporting sites

INSTRUCTIONS: Record the information for contacting health workers,CHWs, PoE officers, or anyone else who can provide information to the district, related to surveillance and outbreak, and events detection e.g., CHWs, trained birth attendants and community leaders. This list is to be updated regularly to add new sites, and delete non-functional or non-participating sites.

Sample list of district reporting sites

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)
Omahenene Health Centre	P.O Box.123 Outapi	Dr. L. Kamati	Tel: 065 214589 or send SMS/WhatsApp to 080 00100100

Annex 1E: Laboratory functions by health system level

LABORATORY FUNCTIONS BY HEALTH SYSTEM LEVEL			
LEVEL	**COLLECT**	**CONFIRM**	**REPORT**
Health Facility	Use SCDs 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 per approved guidelines, include the case-based laboratory reporting form.	Use SCDs 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.
District/ Region	Communicate specimen 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 form.	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/ Reference Laboratories	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 Regional/District Health Teams and all relevant stakeholders at national and regional/district 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.

International Reference Laboratories	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 backup 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 1F: Responsibilities of laboratory focal persons at all levels

National level laboratory focal person

- Coordinate all laboratory-related activities in support of disease preparedness, surveillance and response.
- Establish and support collaboration with epidemiologists/surveillance officers.
- Define laboratory testing capabilities in-country and those referred internationally and share this information with all stakeholders.
- Maintain an updated list of the laboratories performing required laboratory testing.
- Maintain and update list of inventory of supplies, reagents and equipment from all the laboratories.
- Establish agreements with international laboratories for provision of laboratory diagnosis or confirmation of priority diseases not yet available in country and coordinate appropriately.
- 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.
- Ensure that there is a sample transportation framework within the country, and outside the country, to facilitate sample transportation.
- Ensure laboratory results are reported in a timely manner to all relevant stakeholders, and used appropriately to inform public health action and patient clinical management.
- Ensure that there is a proper record for laboratory results.
- Ensure that laboratories have a quality assurance programme (internal and external quality control) to improve the reliability and reproducibility of laboratory results.

Regional laboratory focal persons/area managers

- Maintain an updated list of the laboratories that will perform the required laboratory testing.
- Provide information to all health facilities for correct transport of specimens .
- Maintain and update list of inventory of supplies, reagents and equipment from all the laboratories in the region.
- Ensure that laboratory confirmation procedures established at the national level are known and followed in the region and districts.
- Ensure that specimen collection, transport materials and laboratory diagnostic tests are available to enable the timely detection of priority diseases.
- Coordinate with health facilities and laboratory in collecting, safely packaging and reliably transporting the appropriate specimen for confirming the suspected case.
- 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.
- Ensure that there is a proper record for laboratory results.
- Communicate with reference laboratory and National Laboratory Coordinators as necessary.
- Ensure that laboratories have a quality assurance programme to improve the reliability and reproducibility of laboratory results.

District laboratory focal person

- Establish or strengthen routine communication with identified laboratories that receive specimens, and health facilities or districts sending the specimens.
- Maintain and update list of inventory of supplies, reagents and equipment from all the health facilities and laboratories in the district.
- 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.
- Communicate with regional laboratory focal person.

- Communicate with the national reference laboratory as required.
- Ensure that there is a proper record for laboratory results.
- Ensure that laboratories have a quality assurance programme to improve the reliability and reproducibility of laboratory results.

Facility laboratory focal person

- Maintain and update list of inventory of supplies, reagents and equipment at the facility.
- Ensure that Standard Operating Procedures (SOPs) for sample collection, transportation, confirming the disease or condition and reporting the results are available and are being followed.
- Communicate with the district laboratory focal person and regional laboratory focal person as required.
- Ensure that there is a proper record for laboratory results.
- Ensure that the laboratory has a quality assurance programme to improve the reliability and reproducibility of laboratory result.

Annex 1G: List of national health and veterinary laboratories for confirming priority diseases, conditions, and events

Periodically update the list of laboratories in your district, or those specified by the national level, for confirming priority diseases and conditions. Include persons to contact for assistance.

Sample list of national laboratories

Priority disease, conditions and events	Focal Person, Name of Lab, address, phone number, email
Polio	Example: NICD; Reference Laboratory, Johannesburg, South Africa
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	
Typhoid Fever	

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SECTION 2

REPORT PRIORITY DISEASES, CONDITIONS AND EVENTS

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2. Report priority diseases, conditions and events

Integrated Disease Surveillance and Response (IDSR) is a system with the potential to ensure a reliable supply of epidemiologic information to the national level in order to fulfil the IHR (2005) requirements. Ensuring reliable reporting of surveillance data throughout the system is important. Reliable reporting provides information for surveillance officers, district or regional health authorities, epidemiologists, and competent Port Health officials at PoE, the national IHR FP, the WHO contact person and other health officials to:

- Identify emerging problems or conditions, and plan appropriate responses, including informing the relevant staff or levels;
- Take timeous action;
- Monitor disease trends in the area; and
- 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 timeliness for different purposes:

- Immediate reporting of case-based information allows for the early detection of unexpected or highly pathogenic/lethal public health events. All the diseases and conditions under immediate reporting should also be reported under aggregated weekly report in the IDSR Weekly Summary Reporting Form.
- Weekly aggregated reporting provides data for monitoring trends of diseases, conditions or events to for early detection of outbreaks.
- Monthly/quarterly aggregated reporting provides data for monitoring the health status of the population, the impact of disease-specific programs, and for planning the allocation of resources.

NOTE: National policies and guidelines will determine reporting requirements and the public health events to be reported, and whether data from the districts and health facilities are to be reported immediately, weekly, monthly, or quarterly.

Paper-based tools are the most commonly used tools for reporting these diseases, events and conditions. While paper-based tools can provide timely information, districts should aim to have electronic tools (eIDSR), to facilitate the rapid transmission of data, and enable timeous response to any public health threats. The potential benefits of using electronic reporting tools for IDSR include: timeous reporting, investigation, and response to outbreaks.

Electronic reporting may also:

- improve data quality;
- enhance virtual, near real-time disease and events monitoring capability;
- reduce system costs,
- easily generate automated alerts; and
- allow for easy storage and access of information.

See Section 9 for electronic IDSR (eIDSR) System Guide.

The targeted public health workforce for IDSR are primarily staff at all levels of the health system (human, animal and environmental), data management personnel who will oversee the Information Communication Technology (ICT) aspect of the system at all levels, supervisory and disease- specific programme personnel at all levels i.e., local, district, regional and decision makers at national level. It is important that MoHSS should aim at having an interoperable approach in strengthening eIDSR, by creating systems linkages and information sharing platforms. In addition, an MoU could be signed between the three Ministries (MoHSS, Ministry of Agriculture, Water and Land Reform (MAWLR), and Ministry of Environment, Forestry and Tourism (MEFT), as well as the laboratories.

2.1 Immediately notifiable diseases, conditions and events

Immediate reporting is indicated when an epidemic-prone disease or other potential PHEIC is suspected, or is otherwise required under the IHR (2005). Immediate reporting should also be done for diseases and events considered priorities at the national level, which may not necessarily be PHEICs. The diseases, conditions and events requiring immediate notification to the next level are listed in Table 2.1. 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, specific information of each of the cases identified - will be collected thoroughly 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 (in the district in which the PoE is situated), as well as simultaneously to the IHR NFP. Reporting units with no diagnostic capacity, will use the given SCD to identify and report diseases, conditions and events. Additionally, information of contacts will be collected.

Section 4 contains information on how to conduct contact tracing, and how to report contacts.

For conditions like maternal and perinatal deaths, the circumstances leading to the death need to be gathered and analysed, and health providers should use the national Maternal Perinatal Death Surveillance and Response (MPDSR) reporting forms, in consultation with the relevant FPs.

IDSR has two types of thresholds used to initiate response: an **alert threshold** and an **epidemic threshold.** 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. Thresholds for alerts and epidemic for epidemic-prone diseases, conditions or events are detailed in Section 11.

Please also refer to Section 11 for disease-specific information, including SCDs, and alert and epidemic thresholds for the reporting of suspected cases or events.

Table 2.1: Diseases, conditions or events requiring immediate/weekly reporting

IMMEDIATE REPORTING	WEEKLY REPORTING
1. Acute Haemorrhagic Fever Syndrome (Ebola Virus Disease, Marburg, Lassa Fever, RVF, Crimean-Congo) 2. Adverse Effects Following Immunization (AEFI) 3. Anthrax 4. Bacterial Meningitis 5. Cholera 6. COVID-19/SARS 7. Dracunculiasis (Guinea Worm Disease) 8. Influenza due to new subtype (H5N1 etc) 9. Maternal death 10. Measles/Rubella 11. Neonatal Tetanus 12. Plague 13. Poliomyelitis (Acute Flaccid Paralysis) 14. Rabies (Human) 15. Smallpox 16. Trachoma 17. Typhoid Fever 18. Yellow Fever 19. Any public health event of international concern/ cluster of illnesses, conditions or deaths of public health importance (infectious, zoonotic, foodborne, chemical, radio nuclear or due to an unknown condition).	1. Acute Haemorrhagic Fever Syndrome (Ebola Virus Disease, Marburg, Lassa Fever, RVF, Crimean-Congo) 2. Acute Jaundice Syndrome 3. Adverse Effects Following immunization (AEFI) 4. Anthrax 5. Bacterial Meningitis 6. Cholera 7. COVID-19/SARS 8. Diarrhoea with blood (Shigellosis) 9. Influenza due to new subtype (H5N1etc) 10. Leprosy 11. Lymphatic filariasis 12. Maternal/Perinatal death 13. Malaria 14. Neonatal Tetanus 15. Poliomyelitis (Acute Flaccid Paralysis) (AFP) 16. Rabies (Human) 17. SARI/ ILI 18. Scabies 19. Schistosomiasis (Bilharzia) 20. Typhoid Fever 21. Yellow Fever 22. Unexplained cluster of illness/death from human or animal/bird* 23. Any public health event of international concern/ cluster of illnesses, conditions or deaths of public health importance (infectious, zoonotic, foodborne, chemical, radio nuclear or due to an unknown condition).

* Examples of clusters can be:

- any of cluster of illnesses or deaths among people living in the same community, within a specific time period (e.g., one week);
- Unexplained cluster of deaths of animals/birds, within a specific time period (e.g., one week);
- Illness or death among people after exposure to animals;
- Healthcare worker illness after exposure to patients with similar illnesses;
- Unexpected increases in admission to healthcare facilities of persons with similar, severe symptoms;
- Sudden illness in a person who has travelled out of the country in the past 14 days;
- Any unusual illness or sudden death in the community, within a specific time period (e.g., one week);
- Unexpectedly large numbers of children absent from school due to the same illness, in the same seven-day period; or
- Unexpectedly large numbers of sales of medicines at pharmacies, for the same kind of illness.

NOTE: 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 sectors, food or environment, or other sectors. Ensure that information is also sought from these sectors.

2.1.1 Report case-based information to the next level

- If an immediate notifiable 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 obtained through the preliminary investigation of suspected case includes:
  - Patient's geographical location;
  - Health facility or facilities that managed, handled or referred the patient;
  - Patient's identification and demographic information;
  - Information about signs and symptoms, including date of onset, history of vaccination (where applicable), and information about any relevant risk factors including contacts;
  - Laboratory results (if available);
  - History of travel; and
  - History of contacts (human or animal).

- Any maternal or perinatal death, once occurred, should also be reported immediately, within 48 hours of occurrence. Reference should be made to the national integrated MPDSR guidelines.

A sample reporting form for recording these deaths is contained in Annex K at the end of this section.

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

- Follow up the initial verbal report with a written report using a standardized case-based investigation form. **A sample case-based investigation form for recording case-based information is contained in Annex 2F at the end of this section.** If a computer or other electronic device is available for surveillance or case management, complete and submit the form electronically to the next level. On electronic platforms, ensure that patient privacy is protected by encrypting patient ID data, so that only the relevant health officials can access the detailed information. Alternatively, set up appropriate user rights, such as creating an exclusive password when using a common office computer.

- If a laboratory specimen is requested at this time, make sure that the patient's identifying information on the specimen, the lab requisition form, and the case-based investigation form all match. Ensure proper packaging for reliable results. Ensure also that a copy of the case-based investigation form accompanies the laboratory requisition form and the specimen.

A sample laboratory form is included in Annex 2G.

- Disease-specific case-based investigation 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 Part II: Section 11. These forms may be used to begin gathering initial information for the case investigation.

- Ensure that adequate information is available for events which are reported, as some events might have a link with the agricultural or livestock/wildlife sector, food and environment, or other sectors, including the community. Such information sharing is crucial and should start at the community level, and health facility, and subsequently at the district and region levels. At the national level, the IHR National Focal Point (NFP) should notify WHO of an event that is a potential PHEIC, using the decision instrument in the IHR (2005).

See Annex 2A at the end of this section.

- For all events, establish a line listing of suspected cases, events or conditions reported, as part of initial and ongoing investigation and ensure it is always updated, while at the same time maintaining the link with appropriate sectors, depending on the particular disease or event. The line list should be kept at the location of the suspected outbreak, and where an isolation unit has been opened. If several isolation units have been opened, the district should maintain a combined line list.

See Annex 4E at the end of this section for a sample line list.

2.1.2 Notifying a potential Public Health Emergency of International Concern (PHEIC) under IHR 2005

If a potential PHEIC is suspected (as defined in Annex 2 of the IHR (2005)), the District Surveillance Focal Person should report to the National IHR Focal Point immediately, using the fastest means of communication, and at the same time notify the regional surveillance FP. If a potential PHEIC is detected at a PoE, immediate reporting should also be made to the National IHR FP, while at the same time notifying the district and region.

See Annex 2B at the end of this section for a framework of reporting.

NOTE: The process of notifying WHO of events under the IHR involves the use of the Decision instrument in the IHR. This is a national level function coordinated by the IHR NFP with the support of appropriate experts, depending on the emergency.

2.1.3 Reporting events from community sources

Any suspected event occurring in the community, including cases of maternal and neonatal deaths, should be reported immediately. The trigger mechanisms of reporting must be clearly defined and the information must be immediately notified to a community FP, if already identified, or to a nearby health facility in charge.

Minimum information collected should include:

a. Date of event and date of report
b. Suspected disease, condition, or event
c. What happened?
d. When did this happen? (time, day, month, year)
e. Where did this happen? (exact location, village, constituency, district, region)
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? If yes, for how long?
j. Are there any animal deaths/exposures?
k. Recent history of travel to an affected area
l. Any other relevant information
m. Name and contact number of the person reporting
n. Any action taken.

See the following annexes at the end of this section: Annex 2C for a reporting format when an event is identified, Annex 2D for monthly summary, and Annex 2E reporting structure for community alert and verification of events from community sources.

2.2 Summarize immediate and weekly notifiable diseases

After an initial case has been detected, or an outbreak is suspected or confirmed, summary data is important for analysis and monitoring. For example, at the health facility or district, the surveillance focal person can draw an epidemic curve to see if, and when, the epidemic thresholds for specific diseases have been crossed.

Additionally, the data from the 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 patient's case location or residence, age group, sex, and exposure during social events (for example, a funeral), occupational hazards (for example, slaughtering/butchering animals), consuming game meat, or exposure to a contaminated food or beverage.

At the district level, weekly data analysis includes verification of the quality of the data coming from the reporting sites, and the completeness and timeliness of these reports. For eIDSR, an identified person 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 investigation forms received from the reporting sites is conducted, together with 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 districts. Districts which have computers are encouraged to store the information electronically and forward the surveillance data sets to the next higher level in this format.

2.2.1 Immediate reporting of notifiable diseases/conditions/events

If an immediate notifiable disease, condition or other public health event is suspected, the health facility must report case-based information to the next level within 24 hours. Immediate reporting should be done using the Case Investigation Form (CIF) completed in triplicate. One copy of this form should accompany the specimen, together with the laboratory requisition form, to the laboratory, second copy should be send to the district office for reporting to the next high level, while the third copy is kept in the IDSR file at the health facility for record keeping.

2.2.2 Weekly reporting of notifiable diseases/condition/events

Weekly reporting provides data for monitoring trends of diseases or conditions for the early detection of outbreaks. It is important to ensure that the weekly reporting format is adhered to across all health facilities and districts, to facilitate comparison within, and between, the facilities and districts.

Immediately after reporting to the next level about instances of notifiable diseases, conditions or events, collect and report weekly summary information of the event, disease or condition on which you have reported, as well as for other weekly reported priority diseases, conditions and events, as listed in Table 2.2 on page 126.

Annex 2H at the end of this section contains the format for developing a weekly summary form, which is an aggregate of case-based forms.

With eIDSR, this will be updated automatically in the database, while in areas where paper-based reporting is used, this will be done manually and then entered into a computer.

See Section 9.

This aggregation is important to understand the trend of the immediate notifiable diseases, and to plan for effective intervention. For early detection of outbreaks via weekly aggregated reporting, it is recommended to keep the number of variables at a minimum, ideally reporting only the number of cases and deaths to avoid placing an unnecessary burden on the health facilities, and to maximize reporting efficiency.

Based on epidemiological evidence, districts may decide to include additional diseases, conditions and events for weekly reporting e.g., Malaria, MDR-TB, diarrhoea with severe dehydration in children under 5 years of age, severe malnutrition, and neonatal deaths. Only diseases, conditions or events which could result in public health action should be entered on the list of aggregated weekly reporting. Some rare but high-risk public health events should be removed from routine aggregated reporting, to be reported on an immediate basis. The list of priority public health events to be reported by health facilities is established by a group of relevant stakeholders from, and related to, the national public health surveillance system.

2.2.3 Zero reporting

If no cases of an immediately notifiable disease have been diagnosed 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 notifiable disease when no cases were detected during the week, tells the staff at the next level that a complete report has been filled.

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 programs 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.

Routinely report the total number of cases and deaths seen in a given period (for example, monthly or quarterly) for other diseases of public health importance. All health facilities including district, referral or intermediate, and training hospitals should report summary totals to the district under their catchment area.

Districts should aggregate reports from all reporting sites and provide summary totals to the regional or national level. 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 toward disease control targets, measure achievements of disease prevention activities in the district or region, and identify hidden outbreaks or problems, so that a response action can be taken.

Table 2.2: Diseases and conditions requiring monthly and/or quarterly reporting

MONTHLY/ QUARTERLY REPORTING	
1. Chronic Viral Hepatitis	11. Malaria
2. Diabetes Mellitus (new cases)	12. Malnutrition in children under 5 years
3. Diarrhoea with severe dehydration in children under 5 years of age	13. Noma
4. Epilepsy	14. Non-neonatal Tetanus
5. Soil Transmitted Helminthiasis	15. Scabies
6. HIV/AIDS (New Cases)	16. Schistosomiasis
7. Hypertension (New cases)	17. Severe pneumonia in children under 5 years of age
8. Injuries (Road Traffic Accidents)	18. Sexually Transmitted Diseases (STIs)
9. Leprosy (quarterly)	19. Trachoma
10. Low birth weight newborns (less than 2500 g)	20. Trypanosomiasis
	21. Tuberculosis (quarterly)

NOTE: Based on risk mapping and diseases burden, any other diseases, conditions or events may be categorized into immediate, weekly, monthly or quarterly reports.

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 and sent to the district level. See Annex 2H at the end of this section. The district aggregates the totals from all the health facilities that reported, and submits district summary totals to the national level

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

In cases where a computer is available for surveillance or case management, patient records can be analysed to generate the weekly, monthly or quarterly reports. This information is important for producing national, regional and district situation reports. All datasets should be shared with the health authorities, and a copy sent to the respective disease prevention and control programs. This is important for coordination at national level, and for the building or strengthening of a national IDSR database system.

Depending on each level of laboratory services, laboratory data should be organized in a register so that it can generate monthly summaries. During an outbreak, weekly summaries of the specimens processed, the types of specimens, and the results should be submitted, to assist in completion of the variables in the line list register. Efforts should be made to also update the laboratory component of the IDSR data, and to link the epidemiologic/clinical data. Monthly summaries can include the core tests for the indicator pathogens selected by the country, on the basis of major PHEIC. This is important, as the analysis may produce important trends, and which might necessitate further investigation.

2.4 Improve routine reporting practices

In some health facilities, more than one person may be responsible for recording information about patients seen in the facility. For example, the clinician records the patient's name and diagnosis in a clinic register. Later in the day, a nurse tallies the number of cases and deaths seen in an out-patient service. The ward nurse tallies the number of admitted cases. Each week, month, or quarter, a records clerk/administrative clerk or statistician/HIS officer, calculates summaries for all the diseases, and records them in a standard form. Events should be aggregated separately from diseases. If the health facility is equipped with computers, individual patient records should be entered, and the IDSR priority diseases or conditions subset will be extracted from these records. AThis will then be analysed to get the required weekly, monthly or quarterly compilations.

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

2.4.1 Review the flow of information at the reporting site

During supervisory visits to reporting sites, ensure that:

- All reporting sites including district, intermediate and tertiary hospitals in the catchment area of your district are visited.
- Clinicians record information clearly in the patient records 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.
- Clinicians or other responsible staff should preferably complete the case-based investigation form while the patient is still present.
- Clinicians record laboratory results in the patient records.
- Laboratories should record results of IDSR priority diseases in the laboratory registers/or system with linkage to epidemiologic data.
- Integration of laboratory results into the IDSR reporting forms should be conducted at the health facility level.
- HIS officer/surveillance focal persons should have weekly/monthly summary forms that contain spaces for recording cases and deaths due to the priority diseases or conditions, according to the SCDs.
- Health workers review the weekly, monthly and quarterly IDSR data summary totals and provide comments on the forms about results seen during data analysis. See Section 3.
- Health workers record the summary totals on a recommended weekly, monthly and quarterly IDSR summary reporting form. See Annex 2G at the end of this section.

2.4.2 Keeping records and procedures for managing reporting forms

- Keep a record of IDSR forms, notifications and reports received at your level. This is an essential data source for calculating indicators for your country's IHR report, and for monitoring performance of the IDSR indicators. A sample of the IDSR Reports and Data Sharing Log Book form is contained in Annex 2I at the end of this section.

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

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

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

- 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. Make sure that the staff has access to a standardized form for reporting case-based information.

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

NOTE: Some diseases or conditions like maternal or perinatal deaths, have specific reporting requirements depending on national policies. Please refer to disease-specific and conditions requirements included in Part II: Section 11 of this guide.

2.4.3 Perform periodic checks on data quality

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

Examples of factors that need to be periodically checked, and which may affect data quality include:

- Poorly completed forms (missing values, etc.);
- Incomplete forms (e.g. presence of blanks);
- Under-reporting or over-reporting of cases;
- Duplicate reporting,
- Unsystematic data collection and reporting;
- Untruthful reporting, (e.g., reporting zero, while there is an ongoing outbreak of epidemic prone diseases);
- Inconsistent reporting formats (forms);
- Late submission or reporting;
- Inconsistent reporting periods;
- Calculation errors on aggregate reports; and
- Lack of documentation and source data, or files are lost.

- During supervision, stress the importance of data quality and surveillance - correct data will lead to analysis and interpretation, and the information that will be communicated will lead to action and evaluation. It is recommended that countries conduct regular data quality audits at the reporting sites.

See Annex 2J at the end of this section for a checklist on key elements to assess in data quality audits.

2.4.4 Enhance linkages to strengthen community-based surveillance

A community-based surveillance system relies on the capacity of community members to identify and report public health problems to the nearest health facility, or to the district health office. In this system, CBS focal persons (CBS FPs) identify and report events in the community that have public health significance. CBS FPs act as community informants, and they report to the health facility, or in the case of a serious event, directly to the district authorities.

Community representatives that can be members of a CBS team

Any community member acceptable to the community can be a CBS focal person. Representation could be from basic village-level services such as trained birth attendants, community or village health agents, or similar care providers, CHWs or volunteers, village leaders (religious, traditional or political) or school teachers, veterinarians, health extension workers, chemical sellers, and traditional healers. Once selected, the CBS FPs should receive training and supportive supervision on how to recognize certain diseases or health conditions, for the purpose of reporting suspect cases.

EXAMPLE:

CBS FPs 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 district level heath 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 liaison.

District staff may identify sources in the community who may, due to their position, have the opportunity to know about the community's health status.

Examples of community sources include:

- Chemical sellers,
- School teachers,
- Staff at private clinics,
- Village leaders,
- Religious leaders,
- Traditional healers,
- Birth attendants,
- Community Health Workers (CHWs),
- Community animal health workers,
- Community-Based Organizations (CBOs),
- Other societal leaders,
- Veterinary health workers,

- Any individuals involved in neighbourhood watch or other active surveillance approaches, and
- Other community resource persons.

Depending on the event, resource availability and the context, districts may choose their source of information.

The district can organize CBS FPs by:

- Working with community leaders to identify members of the community to receive relevant training.
- Training and providing job aids on priority diseases, and public health events or hazards to community health informants. (e.g., community registers, leaflets of case definitions etc.) 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.
- Involving CBS FPs in risk mapping, emergency simulation exercises and risk communication during outbreaks.
- Ensuring that the CBS FP gives regular and timely feedback of diseases/events reported by the community. Districts need to ensure that there is sustained commitment from CBS, so as to continuously engage them.
- Disseminating alert and epidemic thresholds.

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

2.4.5 Strengthen linkages between laboratory and surveillance information

The public health laboratory system complements syndromic disease surveillance.

- 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 surveillance officer, and simultaneously to the national level, as well as district and region.
- To strengthen the linkages between epidemiological and laboratory data, the case reported and the lab samples should have the same unique ID.
- Weekly summaries of the specimens processed, and the types of specimens, as well as the results, should be submitted whenever there is an outbreak, to assist in completion of the variables in the line list register.
- During supervision at reporting sites, liaise with the laboratory focal person to ensure that the data for diseases under surveillance is recorded correctly, and that there is also an established register.
- Make sure that the test results are linked with IDSR data at national, regional and district levels.
- The laboratory component of the IDSR Weekly or Monthly Summary Reporting Forms should be regularly updated as soon as the respective disease lab results are ready.
- Liaise with the animal sector so as to have a comprehensive report from the veterinary laboratory as well, especially if they have recorded any animal information which might have risks for public health.

2.4.6 Promote a multi-sectoral, One Health approach, with effective involvement from other relevant sectors

Ensure implementation of the One Health approach to improve reporting of public health risks across all levels, with emphasis on the community level. Emphasize the strengthening of the technical and community capacities of staff for all relevant sectors (human, animal and environment).

Interoperable and interconnected platforms with emphasis on strengthening information systems, within and between the human, animal, and environmental sectors would be ideal in enhancing real time information sharing. There should be a conscious effort made to formalize the system of sharing information with other sectors.

Other key multi-sectoral stakeholders essential for fostering collaboration in the reporting, assessment and strengthening of routine reporting and analysis of public health risks and events include:

- Private health facilities,
- Civil society organizations,
- Faith-based organizations,
- Defence and security forces,
- Correctional facilities,
- Internally Displaced Persons (IDP),
- Refugee camps,
- Private laboratories,
- Technical and financial partners,
- Academic institutions, and
- Research institutions.

2.5 Data protection and security to protect patients confidentiality

The public health community recognizes that name-based reporting of private health-related information might pose a risk to both individuals and communities.

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

NOTE: Use of names may be required during an outbreak of infectious diseases for the purpose of contact tracing.

See Section 4 for information on contact tracing and recording.

Annexes to Section 2

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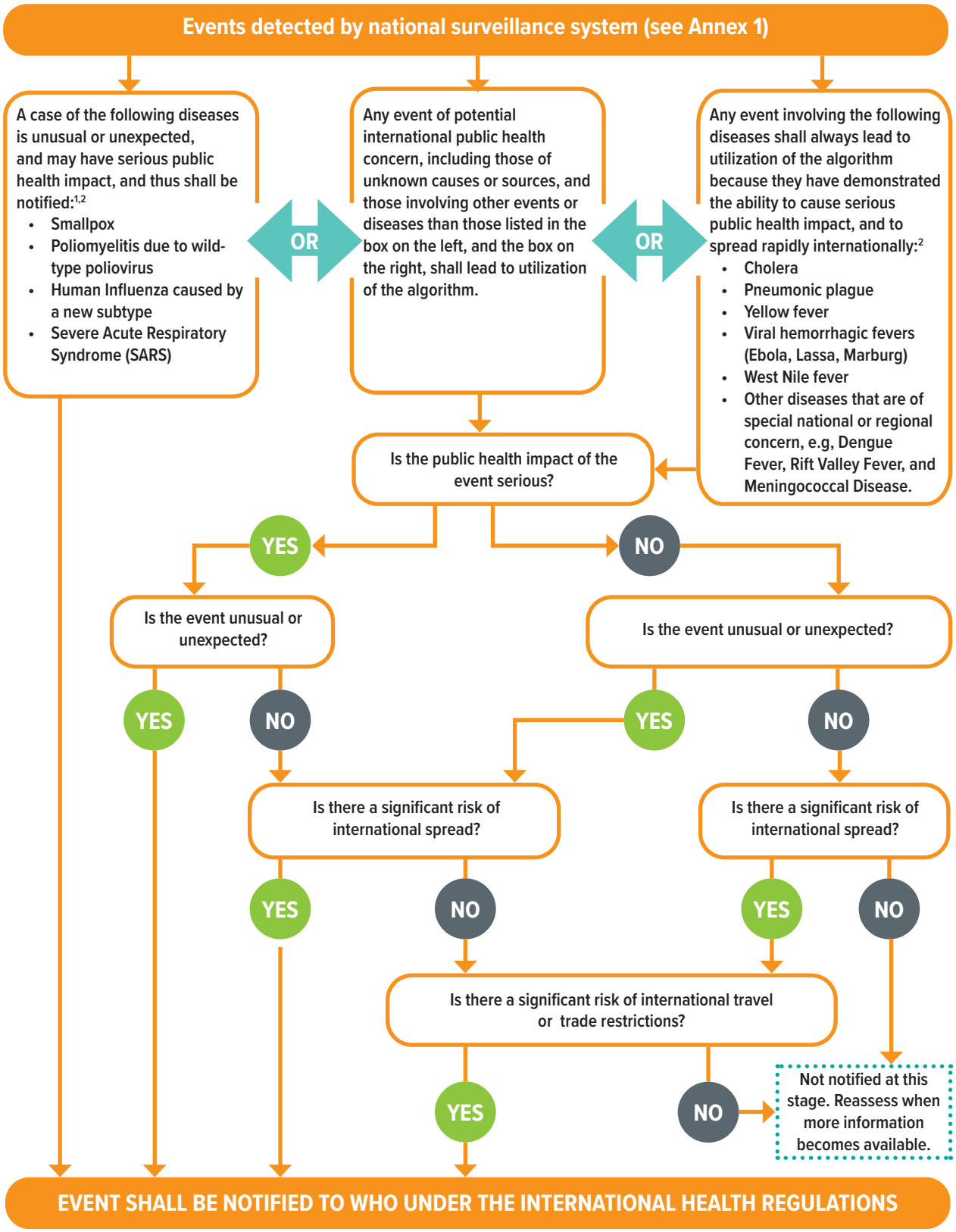
Annex 2A: IHR (2005) Decision Instrument

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

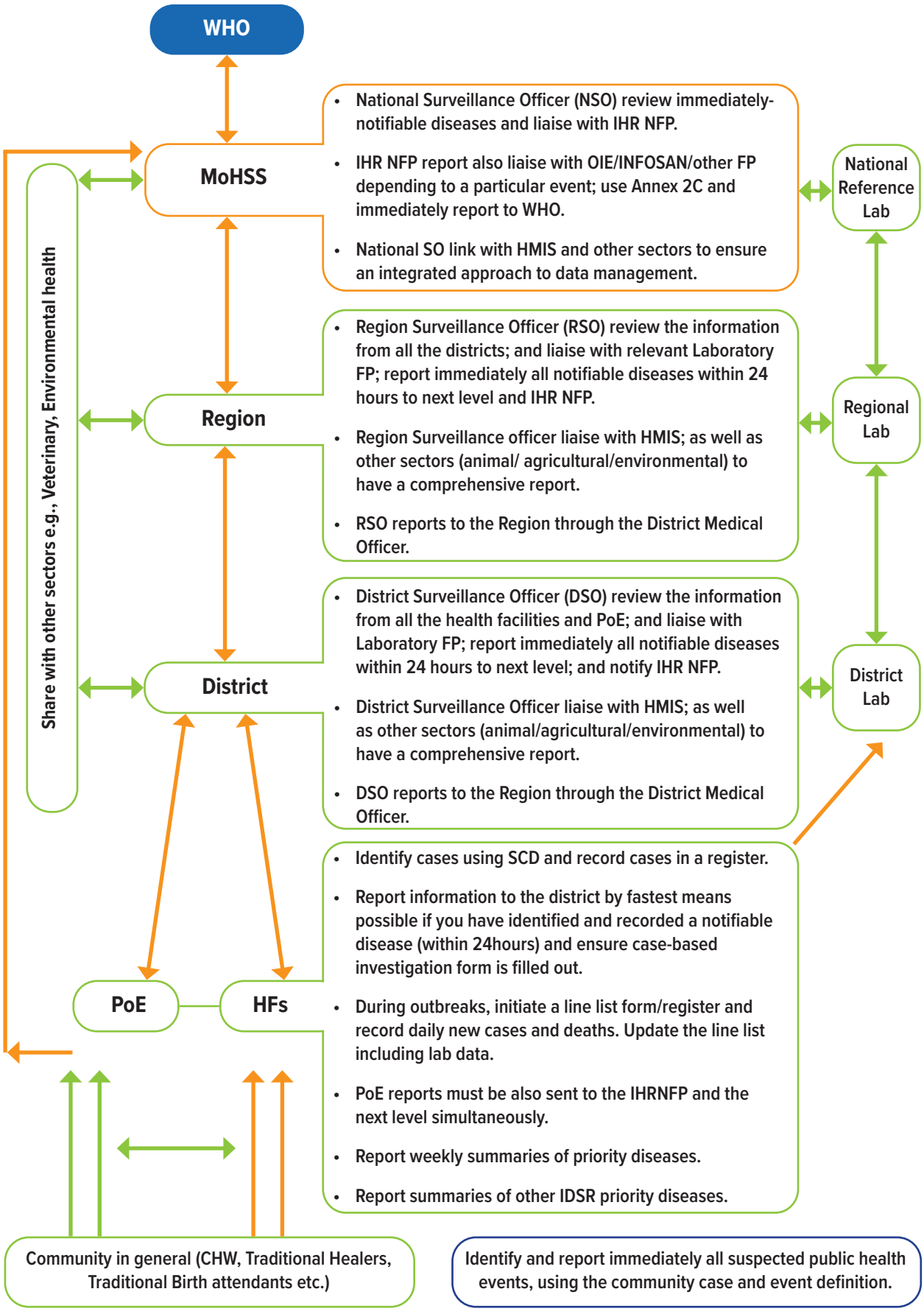


[1] As per WHO case definitions

[2] The disease list shall be used only for the purposes of these Regulations

*States Parties that answer 'yes' to the question whether the event meets any two of the four criteria above, shall notify WHO according to Article 6 of the IHR (2005)

Annex 2B: Algorithm of reporting immediately-notifiable diseases/ conditions/events



Annex 2C: Community alert reporting form

NOTE: This form is used to capture and notify/report the priority diseases (Indicator-based surveillance) and events/alerts (Event-based surveillance) occurring at the community level. This should be duplicated in the form of a CBS Register, with one copy sent to the nearest health facility and a copy kept by the CBS focal person. Sections of the register should include pictures or images of the community case definitions and the predetermined events/alerts, to assist in detection at the community level.

(Send this form immediately to your supervisor or nearby health facility)

Instructions: This form is completed by the CBS FP and immediately submitted to the nearest health facility surveillance FP, 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.

Republic of Namibia

Ministry of Health and Social Services

Sample community alert reporting form

1. Name of CBS FP reporting:_____	
2. Telephone number:_____Community/ village/ location _____District_____	
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, village, district)	
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 2D: Community-Based Surveillance (CBS) suspected diseases and public health events monthly log sheet

NOTE: This form is used to capture and notify/report priority diseases (Indicator-Based Surveillance) and events/alerts (Event-Based Surveillance) occurring at the community level. This should be duplicated in the form of a CBS register, with one copy sent to the nearest health facility and a copy kept by the CBS FP.

(Send this form monthly to the nearest health facility surveillance FP)

Instructions: This form is a line listing of all the diseases/events/alerts identified during the month. It is completed by the CBS FP and submitted to the nearest health facility surveillance FP every month.

Republic of Namibia

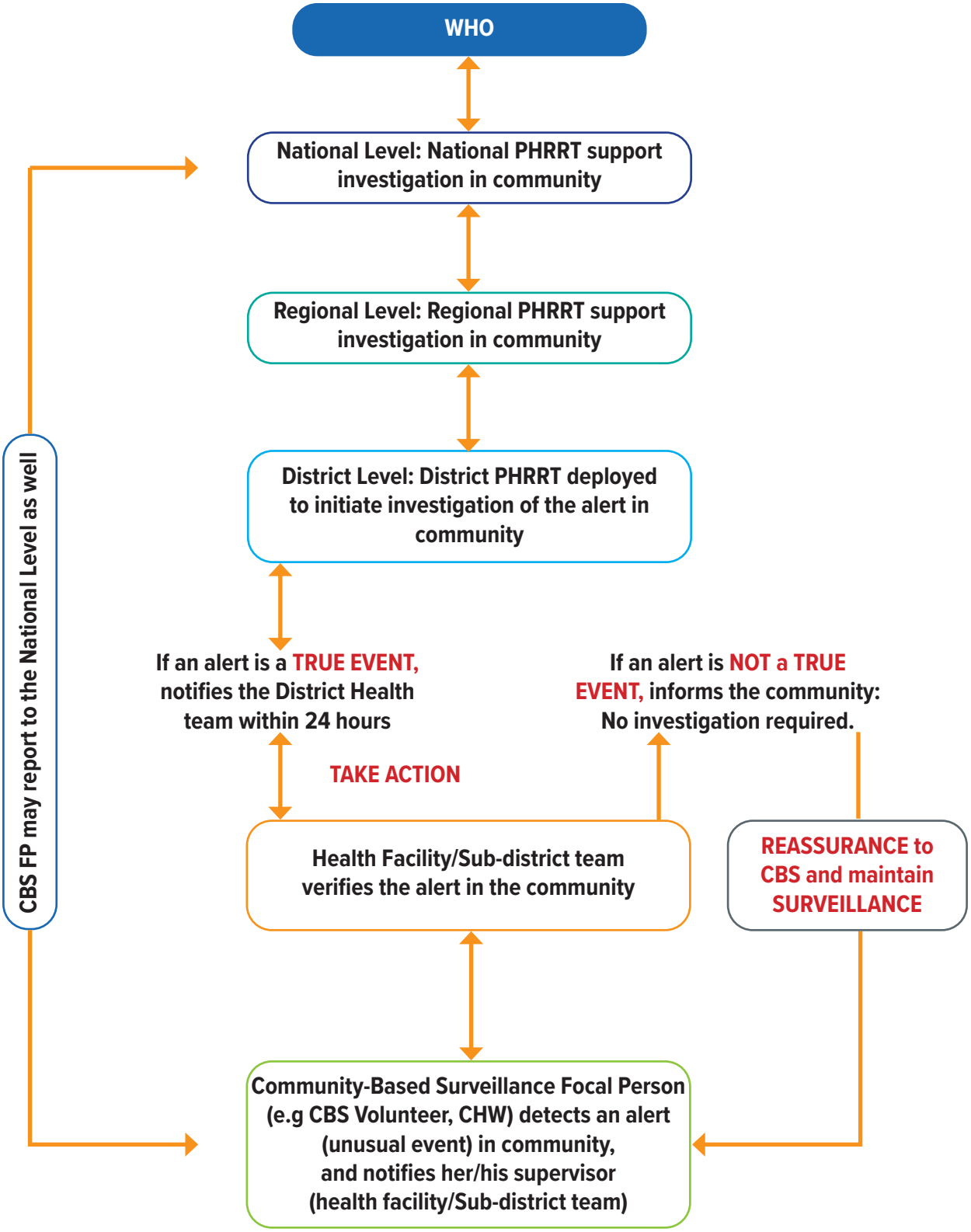
Ministry of Health and Social Services

Sample CBS Suspected Diseases and Public Health Events Monthly Log Sheet

District_____Village/ location_____
Community:_____Month_____ Year_____

Number	Type of illness/ condition/ event/alert	When did this happen? (DD/MM/YYY)	Where did this happen? (village/ location/ district)	How many people have been affected?	How many people died?	What action was taken?
1.	Rash and Fever	12 May 2021	Olukula, Okongo	3	0	Referred to Olukula clinic
2.						

Annex 2E: Reporting structure for community alert and verification



Annex 2F: Health facility notifiable case-based disease reporting form

Republic of Namibia

Ministry of Health and Social Services

Health Facility Notifiable Case Based Disease Reporting Form

Epid Number: _____/_____/_____/_____/_____
Country Region District Year Case Number

☐ Cholera ☐ Diarrhea with Blood/Shigella ☐ Meningococcal Meningitis ☐ Plague ☐ Viral Hemorrhagic Fever ☐ Yellow Fever ☐ Influenza A[H1N1] Other_____

_____ Reporting Health Facility
_____ Reporting District
_____/_____/_____ Date

_____/_____/_____
Received form at national level

_____ Name(s) of patient
_____/_____/_____ Date of birth
_____/_____/_____ Age: years/months/days
_____ unknown

Patient's Physical Address: Village/Neighborhood_____ Sex: Male ☐ Female ☐

District Town/City: _____ Urban ☐ Rural ☐

Patient's Contact number:_____

Travel History:_____

Mother/Father/Guardian:_____Conatact number:_____

Date Seen at Health Facility: _____/_____/_____

For cases of Yellow Fever and Meningococcal Meningitis:
Number of vaccine doses received:_____(9=unknown)
(For, YF- documented by card. For Meningitis, by history)

Date Health Facility Notified District: _____/_____/_____

Dates of Onset: _____/_____/_____ Date of last vaccination: _____/_____/_____

(Yellow Fever and Meningitis only)

Date Specimen Collected: _____/_____/_____ 1=In-patient 2=Out-patient ☐ Outcome: 1=Alive 2=Dead 3=Referred 9=Unknown ☐

Date Specimen Received at Lab: _____/_____/_____

Date Results Received at District: _____/_____/_____ Final Classification: 1=Confirmed 2=Probable/Compatible 3=Discarded 4=Suspected

Person Completing Form:_____

Signature:_____ Date Sent Form to District:_____/_____/_____

Please send a copy of this completed form immediately to the National Surveillance Officer, Epidemiology Division, MoHSS, Private Bag 13198, Windhoek, Tel.: (061) 203 2631/2423, toll free number: 0800100100

Annex 2G: Namibia IDSR weekly reporting form

Republic of Namibia

Ministry of Health and Social Services

Health Facility Summary Report on Diseases under Weekly Surveillance

Year	Week	Disease*	Village and/or Neighbourhood	Cases	Deaths	Lab-Confirmed	Lab Findings	Remarks	Line Graph
		Acute Flaccid Paralysis (AFP)							
		Acute Haemorrhagic Fever Syndrome (Ebola Virus Disease, Marburg, Lassa Fever, RVF, Crimean-Congo)							
		Adverse Effects Following Immunization (AEFI)							
		Anthrax							
		Cholera							
		Cluster of SARI							
		Diarrhoea with blood (Dysentry)							
		Influenza due to new subtype							
		Maternal death							
		Measles							
		Meningococcal Meningitis							
		Neonatal Tetanus							
		Plague							
		Rabies (confirmed cases)							
		SARS							
		Smallpox							
		Typhoid Fever							
		Yellow Fever							
		Any public health event of international concern (infectious, zoonotic, foodborne, chemical, radio nuclear or due to an unknown condition).							

* Priority Epidemic-Prone Disease or Public Health Event of Local, National or International Concern

Analysis, Interpretation and Response

Comments on Trends:	
Comments on Lab:	
Comments on Mortality:	
Conclusion:	
Action Taken:	
Recommendations:	

Date of Report: ___/___/_____/ Deadline for this report: ___/___/_____/ How to qualify this report?____ T=Timely; L=Late

Officer in Charge:_____

Annex 2H: District level IDSR data quality audit checklist

Republic of Namibia

Ministry of Health and Social Services

District Level IDSR Data Quality Audit Checklist

Name of Reporting Officer: _____

Contact Phone Number: _____ E-mail: _____

Health Facility: _____ District: _____

Region:_____ Date:_____/_____/_____ (day/month/year)

Persons Met and Title

CORE ACTIVITY	THINGS TO LOOK FOR AT THE FACILITY			NOTES
1. DATA COLLECTION TO IDENTIFY SUSPECTED CASES WITHIN HEALTH FACILITY	**General**			
	1. Is there an information flow for reporting to the district level (diagram or description)?			
	2. How frequently do you review and collect data (e.g., daily, weekly, monthly)?			
	3. Is there a list of the notifiable diseases?			
	4. Is there a list of priority notifiable diseases/conditions/events?			
	5. For each priority notifiable disease, condition or event, does this facility have case definitions for suspect and confirmed cases?			
	6. Priority notifiable Diseases/conditions/events with case definitions			
	Disease (examples only). Please modify list for your setting.	Yes	No	
	AFP (Suspected Polio)			
	Bacterial Meningitis			
	Viral Haemorrhagic Fever e.g. Ebola			
	Yellow Fever			
	Measles			
	Others specify			
	Case-Based Reporting or Line List Form, IDSR weekly/monthly summary forms			
	1. Is the case-based form, 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?			
Thoughts on possible problems in data collection process. **Examples:** • Unsystematic data collection and reporting procedures due to HCW not knowing. • Lack of lab results due to lack of feedback from higher levels or from the requested lab.	**List possible causes of omissions or problems.**			
	List recommended solutions, including target date and person responsible.			

CORE ACTIVITY	THINGS TO LOOK FOR AT THE FACILITY			NOTES
2. RECORDING OF CASES	1. For suspected cases, what material is reviewed to determine suspected cases (e.g. patient file/Health passport, OPD/IPD Register, case investigation form, line list)?			
	2. For suspected cases, how was diagnosis assessed (e.g., laboratory confirmatory tests, patient signs and/or symptoms, patient history, or consultation)?			
	3. Are priority notifiable diseases recorded in the health facility register or facility line list.			
	4. Randomly select 3 priority diseases; verify how they are diagnosed and recorded.			
Thoughts on Possible problems in recording of cases. **Examples:** • 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:			
3. REPORTING	1. Who is responsible to report priority diseases (health care provider, laboratory, institution)?			
	2. When was the last time a supervisor made a site visit to your facility?			
	3. How often do you report information to the next level?			
	4. Is there a standard method for reporting each immediate notifiable disease?			
	5. Is there a standard method for summary reporting each priority disease?			
	6. Is there a standard method of reporting an outbreak?			
	7. Is the report case-based or aggregate format?			
	8. Is the reporting protocol process mapped out or summarized in narrative format and readily visible in the facility (e.g., on the wall)? Are the surveillance roles outlined and on the wall?			
	9. For priority diseases, are "0" cases recorded and reported?			
	10. Are number of cases of notifiable diseases seen at the facility within a specified reporting period, the same as that reported to the district level? (Randomly select 3 notifiable diseases and verify)			
	11. Are each of the immediately notifiable diseases consistently reported in a timely manner?			
	Immediately-notifiable Diseases			
	Disease	Yes	No	
List findings seen. **Examples:** • Under-reporting or Over-reporting of cases. • Duplicate reporting. • Untruthful reporting, (e.g., reporting zero, while there is an ongoing outbreak of epidemic prone diseases). • Inconsistent reporting formats (forms). • Late submission/reporting. • Inconsistent reporting periods				
Thoughts on Report	**List possible causes of omissions or problems.**			
	List recommended solutions, including target date and person responsible.			

Annex 2I: Maternal and Perinatal Death Reporting Forms

Republic of Namibia

Ministry of Health and Social Services

Maternal Death Reporting Form

Instructions: The form must be completed for **all deaths, including abortions and ectopic gestation-related deaths**, in pregnant women, or within 42 days after delivery, or within 42 days after termination of pregnancy, irrespective of duration or site of pregnancy.

	Questions / Variables	Answers
1	Country	
2	District	
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-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 28 weeks/1000g or more?	
12	Time of death (specify either: "During pregnancy, at delivery, during delivery, during the immediate post-partum period, or long after delivery")	
13	If abortion: was it spontaneous or induced or unknown?	
	Maternal death history and risk factors	
14	Has the deceased received any antenatal care? (Yes/No)	
15	Did she have Malaria? (Yes or No or unknown)	
16	Did she have Hypertension? (Yes or No)	
17	Did she any form of Sepsis (yes or no)	
18	Did she have Ante Partum Haemorrhage or Post Partum Haemorrhage (yes or no)	
19	Did she have Anaemia? (Yes or No)	
20	Did she have Abnormal Lie? (Yes or No)	
21	Did she undergo any previous Caesarean Section? (Yes or No)	
22	What was her HIV Status? (choose "HIV+; HIV-; or Unknown HIV status")	
	Delivery, puerperium and neonatal information	
23	How long was the duration of labour (number of hours)	
24	What type of delivery was it? (choose either: "1=vaginal non assisted delivery, 2= vaginal-assisted delivery (Vacuum/forceps), or 3=Caesarean Section"	
25	What was the baby's status at birth? (alive or stillborn / undelivered)	
26	In cases where the baby was born alive, is he/she still alive or deceased within 28 days after his/her birth? (choose either: 1 = still alive, 2 = neonatal death, or 3 = died beyond 28 days of age)	
27	Was the deceased referred to any health facility or hospital? (Yes/No/unknown)	
28	If yes, how long did it take to get there? (number of hours)	
29	Did the deceased receive any medical care or obstetrical/surgical interventions prior to their death? (Yes/No/unknown)	

Questions / Variables		Answers
30	If yes, specify where and the treatment received*	
31	Primary cause of the Maternal death	
32	Secondary cause of the Maternal death	
33	Analysis and interpretation of the information collected so far (investigator's opinion on this death)x	
34	Remarks	
35	Maternal death notification date (day/month/year)	_____/_____/_____
36	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, epidura, local).		
Definitions		
Gravida: The number of times the woman was pregnant. **Parity:** Number of times the woman delivered a baby of 28 weeks/1000g or more, whether alive or dead.		

Republic of Namibia

Ministry of Health and Social Services

Perinatal Death Reporting Form

Instructions: The form must be completed for perinatal deaths, comprising of stillbirths and early neonatal deaths.

	Questions / Variables	Answers
1	Country	
2	District	
3	Reporting site/facility	
4	Perinatal death locality (village or town)	
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) admission number for the mother.	
8	Record's unique identifier (year-country code-district-site)/admission number 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 have Diabetes Mellitus (Yes/No/Unknown)	
16	Did the mother of the deceased have pre-eclampsia disease? (Yes/No/Unknown)	
17	If yes to16, did the mother receive any treatment? (Yes/No/Unknown)	
18	Did the mother of the deceased have severe anaemia (HB,7g/dl)? (Yes/No/Unknown)	
19	If yes to 18, did the mother receive any treatment? (Yes/No/Unknown)	
20	Did the mother of the deceased have recommended maternal immunizations (e.g. tetanus toxoid) (Yes/ No/Unknown) Specify number of TT dose	1 or 2 or 3 etc.
21	Did the mother of the deceased have Rhesus factor (Rh)? (Yes/ No/Unknown)	
22	Did the mother of the deceased have ABO incompatibility? (Yes/ No/Unknown)	
23	If Rhesus negative did the mother of the deceased receive any treatment given during this baby's pregnancy? (Yes/ No/Unknown)	
24	Did the deceased present in an abnormal Lie (including breech presentation)? (Yes/ No/Unknown)	
25	What was the HIV status of the mother? (choose "HIV+; HIV-; or Unknown HIV status")	
26	What was the status of the syphilis test of mother? (Positive (+) or negative (-)	
27	If she was positive for syphilis did she receive treatment	
	Labour, birth, puerperium	
28	Date of birth (day/month/year)	_____/_____/_____
29	Attendance at delivery (Nurse/midwife/doctor/other-specify).	
30	Was fetal heart rate assessed and present on admission? (Yes, No)	
31	What type of delivery was it? (choose one from "1=Vaginal non-assisted delivery, 2= vaginal-assisted delivery (Vacuum/forceps), or 3=Caesarean section	
32	Sex of the baby (1=male; 2=female, 3=ambiguous)	
33	Birth weight in grams (>=2500; 1500-2499 (LBW); 1000-1499g (VLBW); <1000 (ELBW))	

	Questions / Variables	Answers
34	Did the mother of the deceased have premature rupture of membranes (PROM) (Yes/No/Unknown)	
35	Did the mother of the deceased have foul smelling liquor? (Yes/No/Unknown)	
36	Gestational age (in weeks) Method of estimation: Ultrasound /LMP/SFH (day/month/year)	_____/_____/_____
37	How long (hours) was the duration of labour	
	Information on the death and actions taken before and after the death	
38	If stillbirth – gestational age (in weeks) of the deceased	
39	If neonatal death – age (in days) of the deceased	
40	If the deceased baby was born alive what was the APGAR Score?	____ 1 min _____5 Min _____ 10 min
41	If the deceased baby was born alive, was resuscitation with bag and mask conducted?	
42	If the deceased baby was born alive was he/she referred to any health facility or hospital? (Yes/No/Unknown)	
43	If the deceased baby was born alive did he/she receive any other medical care beyond resuscitation? (Yes/No/Unknown)	
44	If yes, specify where and the treatment received: * I.V. Fluids; Blood/Plasma transfusion; Antibiotics; Oxygen; Other medical treatment;	
45	Primary cause of death:	
46	Secondary cause of death:	
47	Maternal condition (critical/stable (if applicable)	
48	Timing of death (1-fresh stillbirth; 2-macerated stillbirth)	
49	Any physical malformation noted on the deceased? (Yes/No)	
50	If yes, type of birth defect (with full description):	
	Investigator's report	
51	Analysis and interpretation of the information collected so far (investigator's opinion on this death)	
52	Perinatal death notification date (day/month/year)	_____/_____/_____
53	Investigator (Title, name and function)	

Republic of Namibia

Ministry of Health and Social Services

Stillbirths and Neonatal Deaths Monthly Summary Reporting Form

Instructions: The form must be completed for stillbirths and neonatal deaths.

	Questions / Variables	Answers
1	Data for the month of:	
2	Country	
3	District	
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 y	18-19 y	<18 y	Unknown	

Annex 2J: Sample for Epidemiological Calendar week format, 2019-2020

Republic of Namibia

Ministry of Health and Social Services

Epidemiological Calendar week format, 2019-2020

1	31-12-18 to 06-01-19	30-12-19 to 05-01-19
2	07-01-19 to 13-01-19	06-01-20 to 12-01-20
3	14-01-19 to 20-01-19	13-01-20 to 19-01-20
4	21-01-19 to 27-01-19	20-01-20 to 26-01-20
5	28-01-19 to 03-02-19	27-01-20 to 02-02-20
6	04-02-19 to 10-02-19	03-02-20 to 09-02-20
7	11-02-19 to 17-02-19	10-02-20 to 16-02-20
8	18-02-19 to 24-02-19	17-02-20 to 23-02-20
9	25-02-19 to 03-03-19	24-02-20 to 01-03-20
10	04-03-19 to 10-03-19	02-03-20 to 08-03-20
11	11-03-19 to 17-03-19	09-03-20 to 15-03-20
12	18-03-19 to 24-03-19	16-03-20 to 22-03-20
13	25-03-19 to 31-03-19	23-03-20 to 29-03-20
14	01-04-19 to 07-04-19	30-03-20 to 05-04-20
15	08-04-19 to 14-04-19	06-04-20 to 12-04-20
16	15-04-19 to 21-04-19	13-04-20 to 19-04-20
17	22-04-19 to 28-04-19	20-04-20 to 26-04-20
18	29-04-19 to 05-05-19	27-04-20 to 03-05-20
19	06-05-19 to 12-05-19	04-05-20 to 10-05-20
20	13-05-19 to 19-05-19	11-05-20 to 17-05-20
21	20-05-19 to 26-05-19	18-05-20 to 24-05-20
22	27-05-19 to 02-06-19	25-05-20 to 31-05-20
23	03-06-19 to 09-06-19	01-06-20 to 07-06-20
24	10-06-19 to 16-06-19	08-06-20 to 14-06-20
25	17-06-19 to 23-06-19	15-06-20 to 21-06-20
26	24-06-19 to 30-06-19	22-06-20 to 28-06-20
27	01-07-19 to 07-07-19	29-06-20 to 05-07-20
28	08-07-19 to 14-07-19	06-07-20 to 12-07-20
29	15-07-19 to 21-07-19	13-07-20 to 19-07-20
30	22-07-19 to 28-07-19	20-07-20 - 26-07-20
31	29-07-19 to 04-08-19	27-07-20 to 02-08-20
32	05-08-19 to 11-08-19	03-08-20 to 09-08-20
33	12-08-19 to 18-08-19	10-08-20 to 16-08-20
34	19-08-19 to 25-08-19	17-08-20 to 23-08-20
35	26-08-19 to 01-09-19	24-08-20 to 30-08-20
36	02-09-19 to 08-09-19	31-08-20 to 06-09-20
37	09-09-19 to 15-09-19	07-09-20 to 13-09-20
38	16-09-19 to 22-09-19	14-09-20 to 20-09-20
39	23-09-19 to 29-09-19	21-09-20 to 27-09-20

40	30-09-19 to 06-10-19	28-09-20 to 04-10-20
41	07-10-19 to 13-10-19	05-10-20 to 11-10-20
42	14-10-19 to 20-10-19	12-10-20 to 18-10-20
43	21-10-19 to 27-10-19	19-10-20 to 25-10-20
44	28-10-19 to 03-11-19	26-10-20 to 01-11-20
45	04-11-19 to 10-11-19	02-11-20 to 08-11-20
46	11-11-19 to 17-11-19	09-11-20 to 15-11-20
47	18-11-19 to 24-11-19	16-11-20 to 22-11-20
48	25-11-19 to 01-12-19	23-11-20 to 29-11-20
49	02-12-19 to 08-12-19	30-11-20 to 06-12-20
50	09-12-19 to 15-12-19	07-12-20 to 13-12-20
51	16-12-19 to 22-12-19	14-12-20 to 20-12-20
52	23-12-19 to 29-12-19	21-12-20 to 27-12-20
53		28-12-20 to 03-01-21

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SECTION 3

ANALYSE AND INTERPRET DATA

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3. 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. Organizing 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:

- Observing trends over time, and alerting health officials and relevant stakeholders about emergent events or unusual patterns;
- Identifying geographic areas at higher risk;
- Characterizing personal variables such as age, gender or occupation that place a person at higher risk for the disease or event; and
- Monitoring and evaluation of public health interventions.

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

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

Each site that collects or receives data should prepare and follow an analysis plan for analysing routine surveillance information.

See Annex 3A at the end of this section.

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

3.1 Receive, handle and store data from reporting sites

The routine flow of surveillance data is usually from reporting sites to the next level, and up to the national level. A reporting site is any site which reports surveillance and outbreak data to the next level. This includes all health facilities (public, private and parastatals, or faith-based), laboratories, and PoE. A reporting site also contains event reports received from community surveillance and response.

At the health facility level, both inpatient and outpatient services are surveillance sites. The information collected from the site is compiled in standard forms (Weekly and Monthly IDSR Summary Reporting Forms, Case Investigation Forms, Line Listing forms etc.), analysed and then forwarded to the district health management team. In areas where there is already an eIDSR system, data is entered using a mobile phone or a computer, and the district health management team can access the compiled information from a computer.

See Section 9 on eIDSR for more specific examples.

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 where they may be visible to unauthorized people. 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 the 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 site. The surveillance team at each level or reporting site where data is received should:

- Acknowledge receipt of the data/report.
- Indicate the sender, the timeliness, completeness as well as the date of reporting on the weekly IDSR Report form, when received from the reporting site.
- Verify whether the data set arrived on time, or was late.
- Check the completeness of the data set or reports (i.e., the number of data sets/reports as against the number of expected data sets or reports).
- Review the data quality:
- Verify whether the form (hard copy or electronic file) has been filled out accurately.
- Ensure that the form is filled completely (e.g., no blanks).
- Check that there are no discrepancies on the form. Verify from the reporting site (by phone, e-mail or text message), and correct any discrepancies.
- Merge the data and store it in a database.

See Section 9 on eIDSR.

3.1.2 Enter and clean the data

At each level where data is received (health facility, district, region or national), the surveillance team should always liaise with the HIS Officer to extract the priority IDSR diseases from the register, and enter them correctly into aggregated weekly IDSR reporting forms, while listing data from all the reporting 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 geographic location of cases are missing.

Use opportunities during supervisory visits to sensitize clinicians and laboratory staff about the importance of quality practices for recording patient information in the patient register, or reporting forms. Emphasize that patient registers are sources of data for reporting public health information, and may play a role in detecting an unusual event or otherwise undetected public health problem.

Ensure that health workers know the algorithm for reporting and that the records, such as registers of rumours, are maintained and up to date.

Data may be recorded and aggregated either manually or electronically if a computer is available.

Regardless of the method, use the following practices:

- Update aggregate totals for each week or month that data was received.
- Record a zero when no cases were reported. If a space which should have been filled in is left blank/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.
- Ensure that weekly totals include only those cases or deaths actually reported, for that specific epidemiological week (Monday to Sunday). Late reports from previous weeks should be entered with the relevant week, and totals updated accordingly.
- Avoid duplicate entries by using the report or case record unique identifier to prevent, and also check for, multiple entries of the same records.
- Establish frequent contacts with the reporting sites in order to clarify issues of missing information / errors and address inconsistencies detected in the reporting.
- Ensure consistency and harmonization of data.
- Ensure 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.

NOTE: During an outbreak, ensure 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 below.

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

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 l**ine graph, histogram** or **sequential maps.**
Place	Identify where cases are occurring (e.g., to identify high risk area or the location 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. (e.g. cases near a river, cases near a market).	Plot cases on a spot map of the district or area affected during an outbreak. Dot density analysis can also be used to depict the number of cases by geographic location **NB: The information can also be presented in a table or a bar chart, but plotting cases on a map will assist in quick assessment, and allow for 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 summarize in a **table, bar chart** or **pie chart.**

3.2.1 Analyse data by time

Data from this type of analysis is usually shown on a graph. The number, 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. Any events which 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.

See Annex 3B at the end of this section for details of how to make a graph.

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

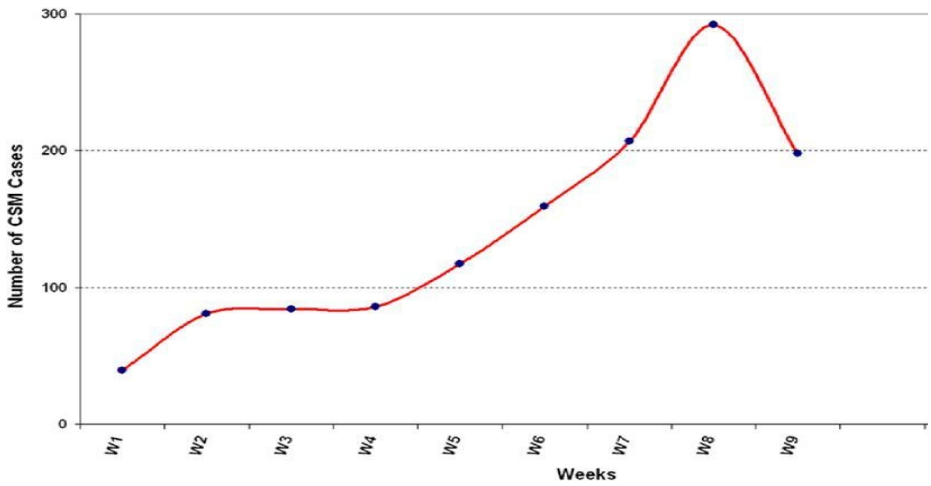


Figure 3.2: Trend line by week, Burkina Faso

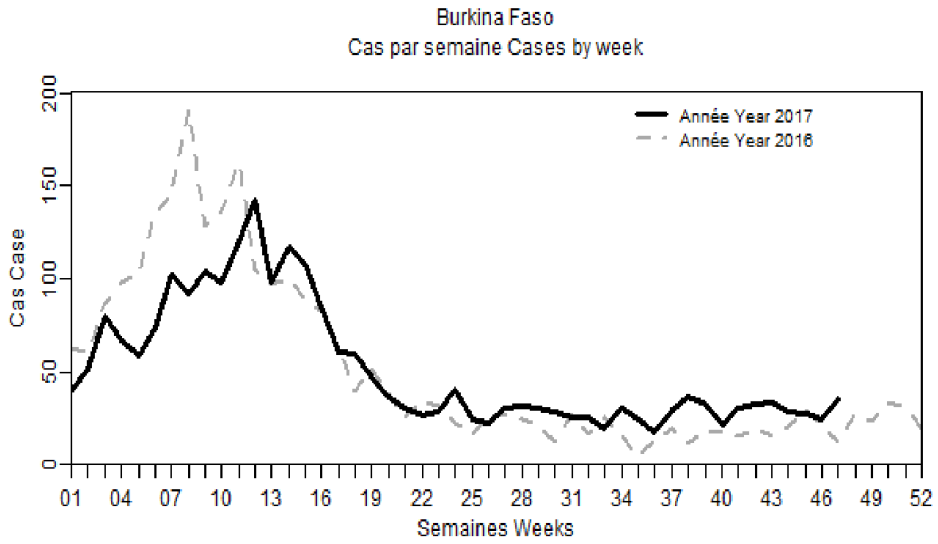
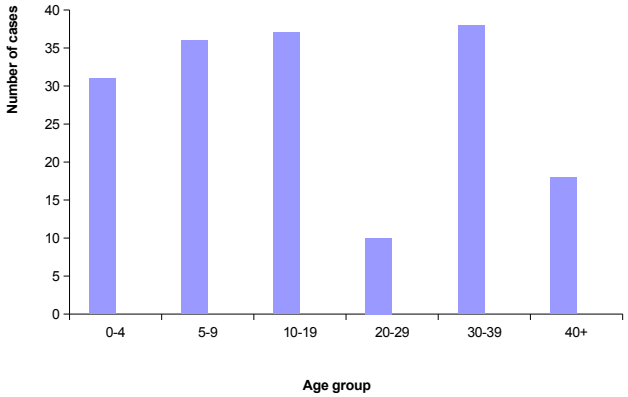


Figure 3.3: Example of a bar graph: Age distribution of diarrhoeal cases during an outbreak in Town X, 2019



Using a histogram

Prepare a histogram using data from the case reporting forms and line lists. Plot cases on the histogram according to the date of onset. As the histogram is developed, it will demonstrate an epidemic curve. The title of the graph should include the name of the geographical location being described.

Highlight significant events on the histogram with arrows.

For example, review the log of reported outbreaks to highlight the dates, to indicate when:

- Onset of the first (or index) case was noted;
- The health facility notified the district;
- The first case was seen at the health facility;
- The district began the case investigation;
- Lab confirmation of the outbreak;
- A response initiated; and
- The district notified the next higher level.

The result of this analysis allows 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, 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, District A, Epidemiologic week 1 to 31, 2016

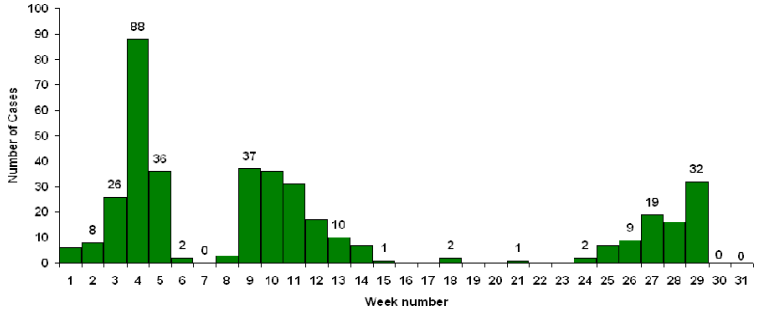
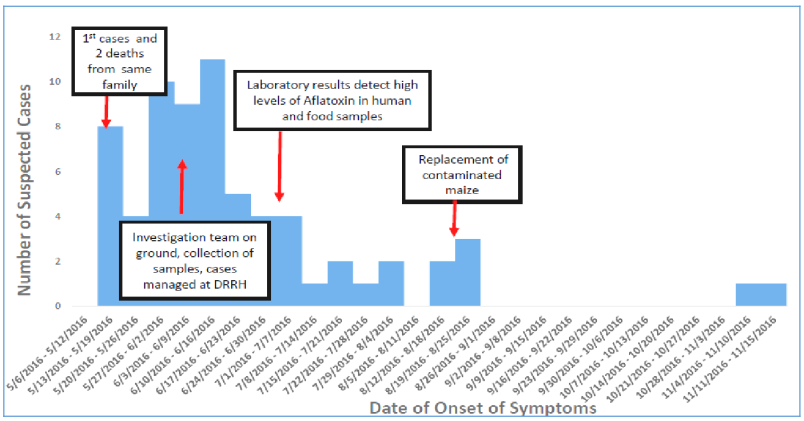


Figure 3.5: Cases of Aflatoxicosis by date of onset of symptoms, Dodoma and Manyara Regions, Tanzania, 2016



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 geographic area.

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

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

Use manual methods or open source Geographic Information System (GIS) software, such as Health Mapper, Quantum GIS, or Geographic Information Software (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:

- Roads, water sources, location of specific communities, and other factors related to the transmission risk for the disease or condition under investigation.

EXAMPLE 1

A map for Neonatal Tetanus includes locations of traditional birth attendants and health facilities where mothers deliver infants, as well as, 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.

EXAMPLE 2

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. Section 11 includes disease-specific guidelines on specific recommendations for analysing data by place.

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

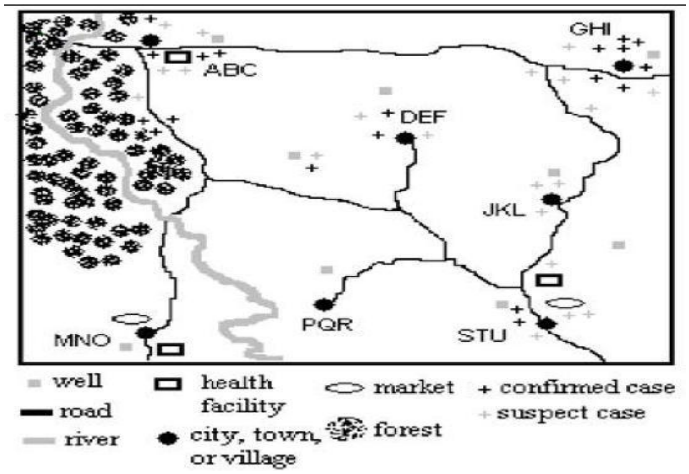
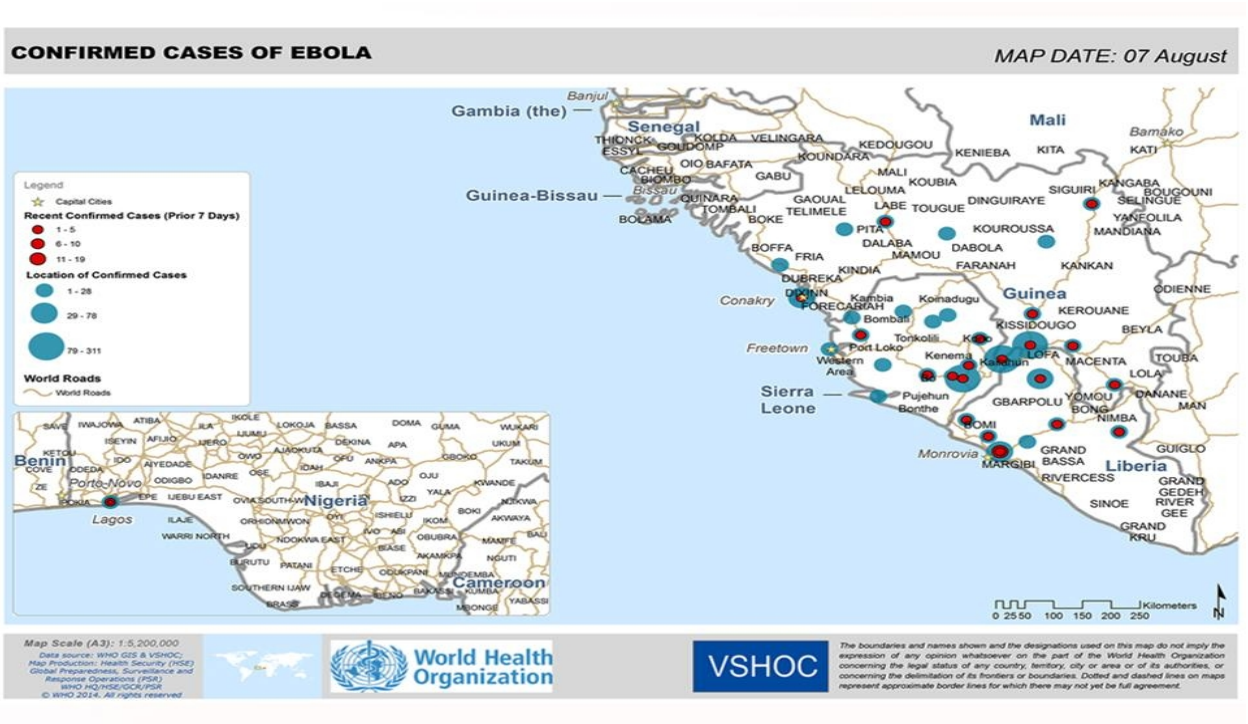


Figure 3.7 Example of a spot map using a GIS software, showing concentration of cases along one particular area



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:

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

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

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

- The numerator is the number of specific events being measured (such as the actual number of cases or deaths of a given disease, e.g., the number of cases of measles that occurred during the year in school age children.
- 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 age 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 (i.e. number of new cases) of measles cases during the last 12 months in school aged children, the district officer can compare the impact of the illness on each facility. The numerator is the number of 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 by this method, is called the 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 person analysis

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 organized in columns and rows.** The purpose of a table is to present the data in a simple way. For surveillance and monitoring, use a table to show the number of cases and deaths from a given disease that occurred in a given time.

TO MAKE A TABLE:

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

2. Decide how many columns and rows you will need. Add an extra row at the bottom and an extra column at the right to show totals as needed.

In the example below, you will need a row for each age group, and a column for each variable such as **age group** or **cases** and **deaths.**

Age group	Number of reported measles cases per year	Number of deaths per year	TOTAL
0 - 4 years	40	4	
5 - 14 years	9	1	
15 years and older	1	0	
Age unknown	28	0	
TOTAL	**78**	**5**	

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

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

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

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

To calculate this percentage:

1. Identify the total number of cases reported within each age group, from the summary data for which time or person characteristics are known.

For example, there are 40 cases in children 0 to 4 years of age.

2. Calculate the total number of cases for the time or characteristic being measured.

In this example, there are 78 cases whose age is known.

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. Divide the total number of cases within each age group by the total number of reported cases.

For example, for children age 0 to 4 years, divide 40 by 78. The answer is 0.51.

$$40 \div 78 = 0.51$$

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

$$0.51 \times 100 = 51\%$$

Age group	Number of reported cases per year	% 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%**

5. Do the same for all of the rows. For example, divide 9 by 78 and multiply by 100. The answer is 12%.

$$9 \div 78 = 0.12 \times 100 = 12\%$$

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.

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

To calculate the attack rate, divide 16 by 800:

$$16 \div 800 = 0.02$$

To calculate the percentage, multiply the result above by 100:

$$0.02 \times 100 = 2\%$$

(i.e. 2 cases per 100 population = 2%)

NOTE: 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:

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

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

To calculate a case fatality rate:

1. Calculate the total number of deaths.

In the example of the measles data, there are a total of 5 deaths.

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**

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. Divide 5 by 78 =0.06.

$$5 \div 78 = 0.06$$

3. Multiply the answer by 100 to get a percentage number.

$$0.06 \times 100 = 6\%$$

Age group	Number of reported measles cases per year	Number of deaths per year	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%**

NOTE: Part II: Section 11 contains the disease-specific guidelines for recommendations on the essential variables that should be compared for each disease.

3.3 Compare analysis results with thresholds for public health action

Thresholds are markers that indicate an unusual situation, and require that something should happen or change. They help surveillance and program managers answer the question, *"When should I take action, and what will that action be?"*

Section 4.1 contains information on establishing thresholds.

Thresholds are based on information from two different sources:

- 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.

- International recommendations from technical and disease control program experts.

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

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

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

In other situations, a number of cases will trigger a response.

EXAMPLE

The epidemic threshold for Bacterial Meningitis in countries of the Meningitis Belt, is 10 suspected cases per 30,000 to 100,000 inhabitants per week, and under 30,000 inhabitants is 5 suspected cases in one week, or doubling of the number of cases in a three-week period (minimum of 2 cases in one week), and the alert threshold is 3 suspected cases per 30,000 to 100,000 inhabitants per week, and under 30,000 inhabitants is 2 suspected cases per week, or an increased incidence compared to previous non-epidemic years.
(Source: Weekly Epidemiological Record No 51/52, 577-588, , 19 December 2014(http://www.who.int/wer).

The epidemic threshold for Malaria in some countries is the 3rd quartile of confirmed Malaria cases for the past 5 years; and the alert threshold is the 2nd quartile/median of confirmed Malaria cases.

In practice, the national level is responsible for communicating the thresholds for priority diseases to all reporting sites in the health system. This facilitates 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.

See Part II: Section 11 for the suggested thresholds for taking action for specific diseases or conditions.

3.4 Draw conclusions from the findings to generate information

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

2. **Systematically review the findings following the district's analysis plan if one has been prepared.**

See Annex 3A at the end of this section.

3. **Make sure to also correlate the analysis with other data sources, such as 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 bite investigations, quarantined animals, or dogs vaccinated.

4. **Consider quality of the data when interpreting results.** For example:

   - missing data values (completeness per month, per event);
   - inconsistencies (between linked data elements – validation);
   - arithmetic errors (in correlation & aggregation); and
   - obvious fluctuations (sharp increase or decrease per month, per event).

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

   - Data input validation;
   - Maximum and minimum values; and
   - Validation rules.

5. **At a minimum, review the findings to:**

   - Assess whether the situation is improving or not.
   - Make a comparison of the observed data against 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 programs, 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?
- Is there increased awareness of disease in the public? e.g., mass vaccination campaign and awareness of a particular disease will lead to an increase of cases presented to the facility.
- Is there a backlog of cases being reported, which were supposed to be reported earlier?

3.5 Summarize and use the analysis to improve public health action

Prepare and share a concise action-oriented summary report of the surveillance findings with all stakeholders, including affected communities who need this information. Use simple tables, graphs and maps, with clear and short descriptions, interpretations, comments and recommendations.

Make statements that describe the conclusions you have drawn from the surveillance data analysis results.

Use them to take action to:

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

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 inherent in information sharing. It is therefore extremely important to share analysis results and provide feedback on time.

Section 7 and 8 contain information and examples on communication, and sharing feedback.

Annexes to Section 3

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Annex 3B How to manually make a line graph.....174

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 have been received on time, and whether all reporting sites have reported, is an essential first step in the routine analysis of the surveillance system. This assists the district (or other level) surveillance team in identifying silent areas (areas where health events may be occurring but which are not being reported), or reporting sites that need assistance in transmitting their reports. It also reflects how representative the data is, for the specific level.

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

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

4. **Use geographic variables (such as hospitals, residence, reporting site, neighbourhoods, and village etc.) to analyse the distribution of cases by place.**
   This information helps to identify high risk areas.

5. **Analyse disease trends for at least the diseases of highest priority in your district.**
   Monitor the trends for cases, deaths, and case fatality rates to identify any unusual increases 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.

See the example of an analysis plan for routine surveillance information on page 173, opposite.

Example of data analysed for Cholera in country A, 2017

Distribution 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 by Place

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

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

Distribution by Person

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

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

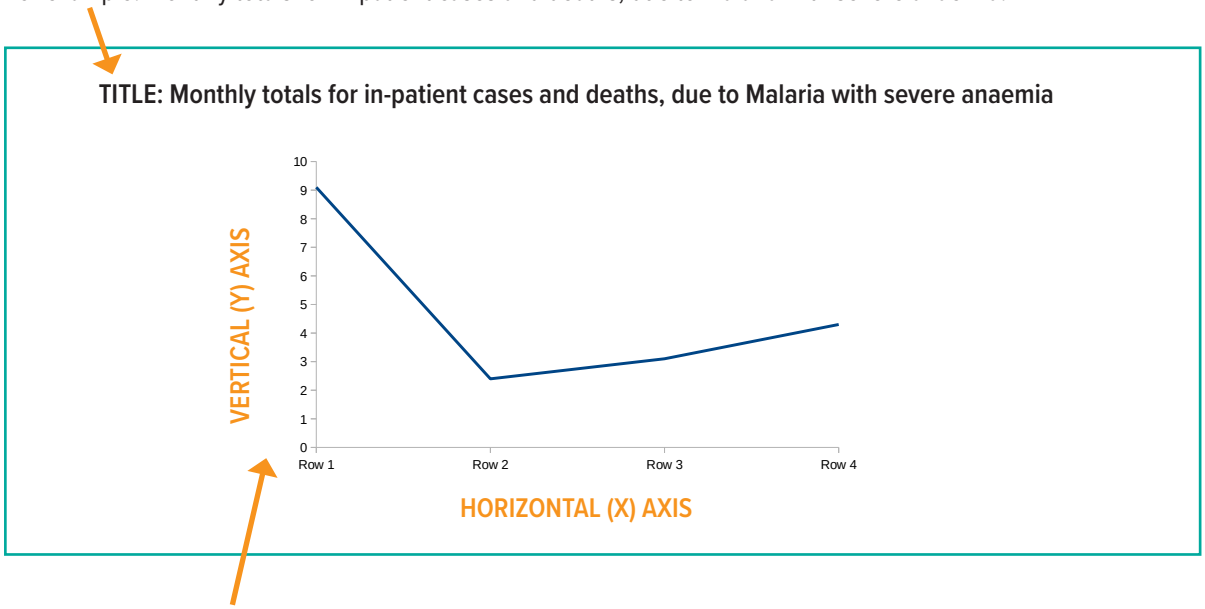
Annex 3B: How to manually make a line graph

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.

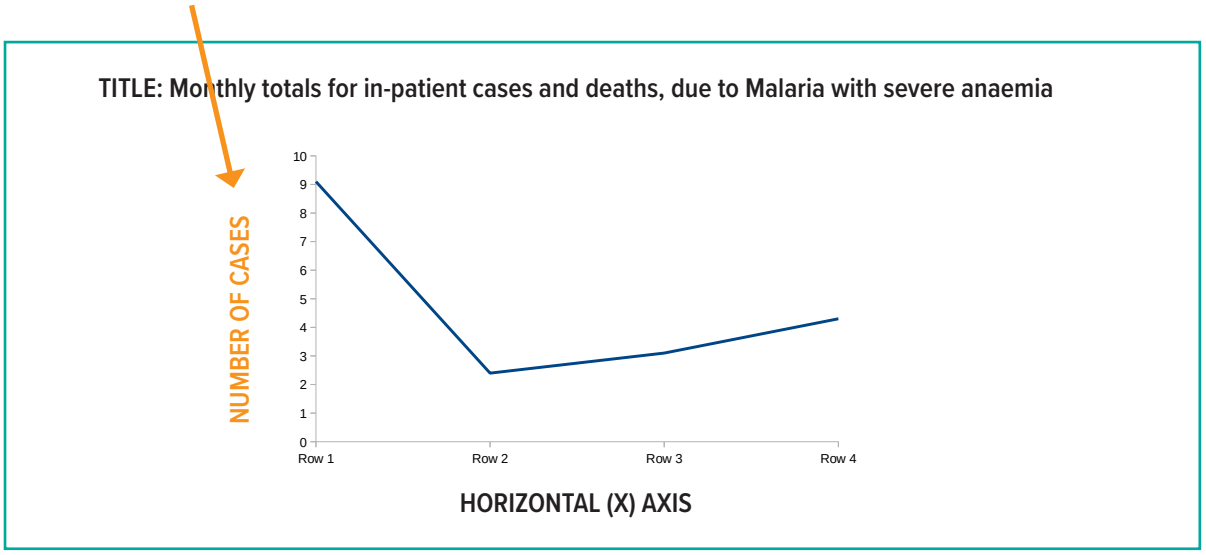
For example: Monthly totals for in-patient cases and deaths, due to Malaria with severe anaemia.



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.
- Choose an interval, if the numbers you will show on the vertical axis are large, i.e, 0 - 20 - 40 - 60 etc.

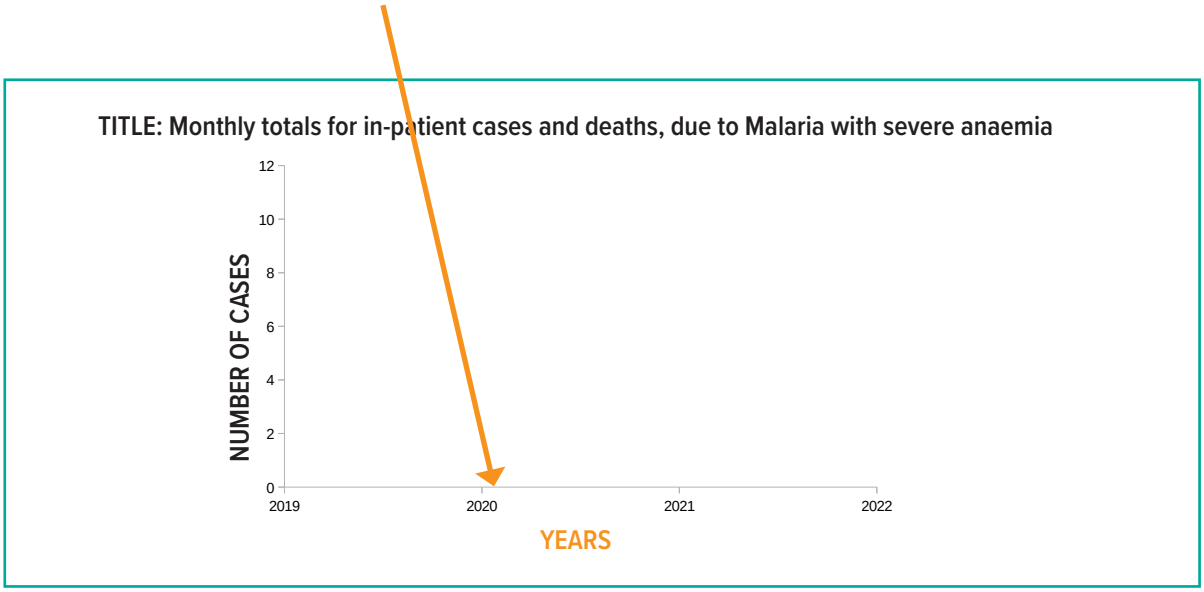
4. Label the vertical axis, explaining what the numbers represent.



5. Label the horizontal axis and mark the time units on it.

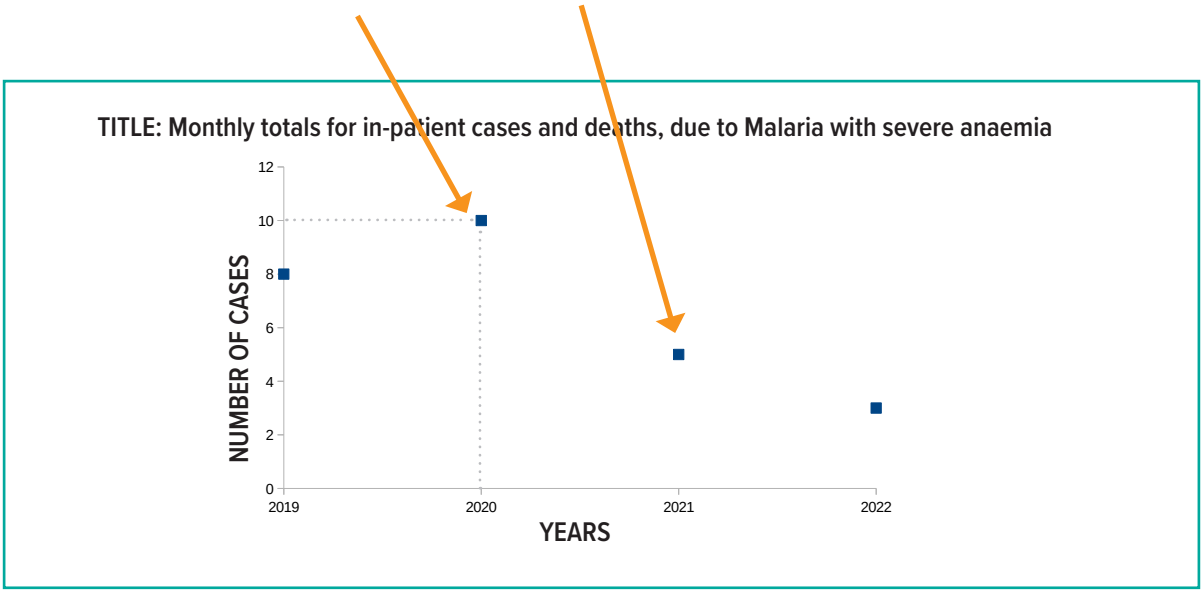
The horizontal axis is divided into equal units of time. Usually, you will begin with the beginning of an outbreak, or the beginning of a calendar period, such as a week, month or year.

6. Space out the years evenly on the horizontal axis.



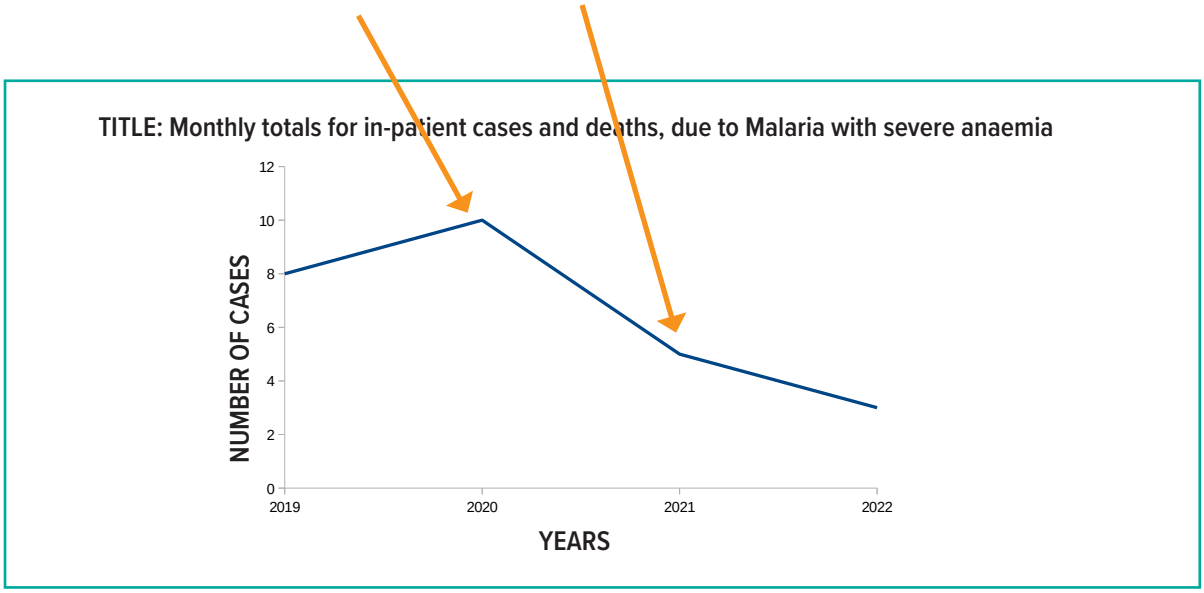
7. Mark the number of cases on the graph or histogram.

For the corresponding year on the horizontal axis, find the number of cases on the vertical axis. Make a mark at this point - draw a cross or make a point where the horizontal and vertical lines cross. Repeat this until each year has a mark, level with the number of cases.

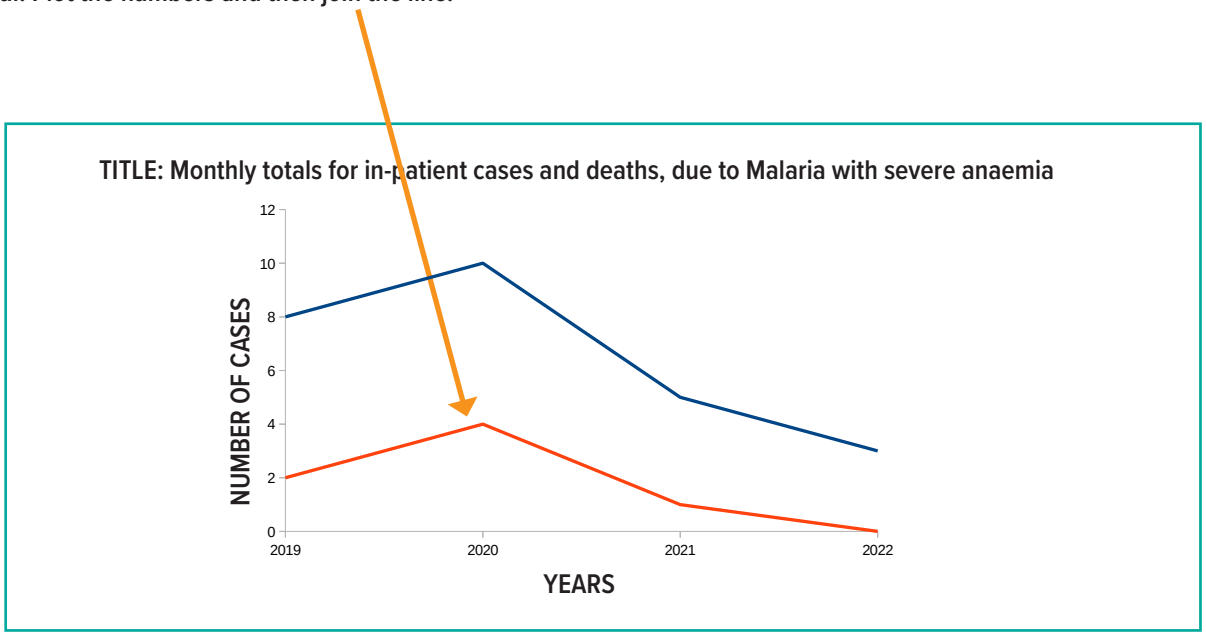


In the example above, there were 8 cases in 2019 and 10 cases in 2020 etc.

8. Connect the points on the graph, creating a line, to show the trend going up or down over time.



9. Show other information, e.g., deaths, on the same line graph, by using a different pattern of lines, or a different colour. Plot the numbers and then join the line.



In the example above, there were 2 deaths in 2019 and 4 in 2020 etc.

SECTION 4

INVESTIGATE AND CONFIRM SUSPECTED OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

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4. Investigate and confirm suspected outbreaks and other public health events

This section describes what needs to be done 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 in that population in a given area, over a particular period of time.*'

When an outbreak or any public health event or condition is detected and notified, there are several steps which are required for an outbreak investigation. These steps are usually listed in order of priority, but their order of implementation is often non-sequential. It is important to understand these steps in order to prepare for an investigation, using common sense and logic to determine when, how often, and to what extent the different steps should be implemented. These steps can also be used to investigate other public health problems in the district, such as when an increase in chronic or non-communicable disease is detected.

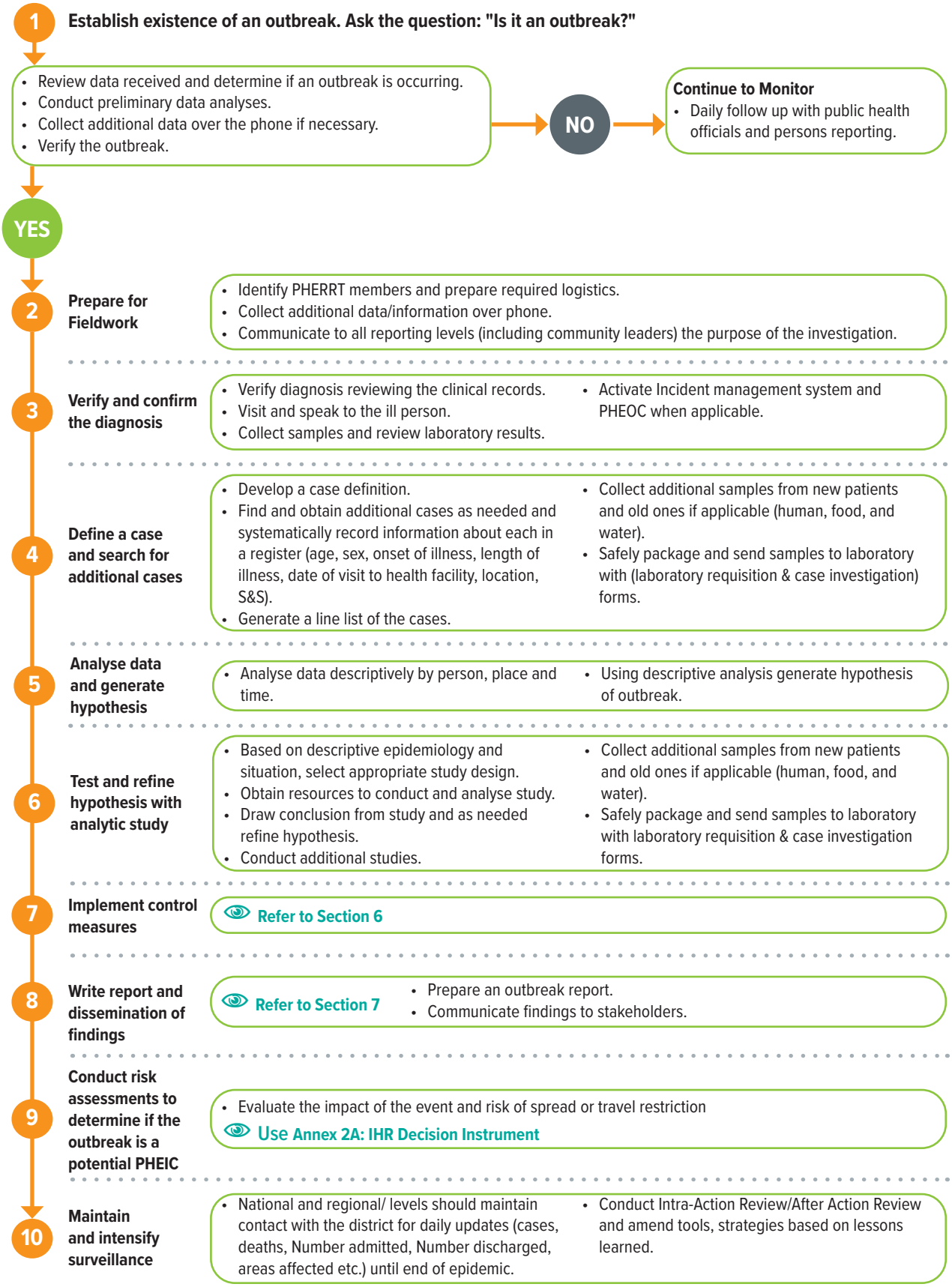
See Figure 4.1 on page 174.

The results of an investigation - of an outbreak or other public health event - leads to the identification and assessment of people who have been exposed to an infectious disease, or affected by an unusual health event. The investigation provides the relevant information needed for taking immediate action, and improving longer-term disease prevention activities.

The purpose of an investigation is to:

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

Determining who, or which entity is able to investigate an outbreak depends on national policy, where resources are, and the local policy. Districts generally have the overall responsibility for investigating outbreaks. These guidelines assume that the district level has the responsibility for leading the investigation, and the guidelines also apply to health facilities and /regions.

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

For example, a single case of a communicable disease which has not been present in the population for a long time, or one which has been caused by a causative agent not previously recognized in that community or area (e.g., bacterium or virus), or the emergence of a previously unknown disease or event, may also constitute an outbreak and should be reported and investigated. For other diseases, the trigger for taking action is when cases reach a defined **threshold** (e.g., a particular number of cases per 100,000 population) in a defined community, geographical area or season.

Health workers should promptly investigate the problem and respond to the immediate cases. Preparations for taking a wider public health response should also be made.

See Part II: Section 11 for a detailed description of alert and epidemic thresholds.

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

Some urgent health events require investigations to be started immediately. **Districts should aim to investigate suspected outbreaks and events within 48 hours of notification from the lower level, e.g., community notification of an event.**

Conduct an investigation when:

- The district receives a report of a suspected outbreak due to a disease that is targeted for immediate notification.
- An unusual increase is seen in the number of cases or deaths during routine analysis of data.
- Alert or epidemic thresholds have been reached for specific priority diseases. The initial trigger for a new epidemic-prone disease could be the laboratory.
- Communities or social media report rumours of deaths, or a large number of cases that are not being seen in the health facility.
- A cluster of illnesses or deaths occur for which the cause is not explained, or is unusual (for example, an adult death due to bloody diarrhoea, a cluster of illnesses among healthcare workers, a cluster of animal (domestic and/or wildlife) deaths e.g., bird die offs due to avian influenza, livestock deaths due to anthrax, or unusual abortion events in livestock).

II. Verify the reported information

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

To verify the information, consider the following factors:

- Source of information (i.e., is the source of the rumour reliable? Is the report from a health facility, a community or social media?)
- Severity of the reported illness and the use of standard case definition for reporting.
- Number of reported cases and deaths.
- The age and sex of reported cases or deaths.
- Mode of transmission of the suspected pathogen and any risk for wider transmission.
- Political or geographic considerations.
- Importance of maintaining good partner and community relations.
- Available resources.
- Is it of national or international concern?

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

NOTE: 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 the next 24 to 48 hours.

III. Record reported outbreaks, public health events and alerts

Prepare a method for tracking reported suspected outbreaks, events and rumours to the district. This is to ensure that the report of each suspected outbreak, event or alert is followed by some action and resolution. Keeping this record will help to gather information for evaluating the timeliness and completeness of the outbreak investigation and response process in the future.

See Annex 4A at the end of this section for a sample form for tracking reports of outbreaks and rumours.

If the district is using a district analysis workbook for recording and analysing long-term trends, the district should include the tracking form in the District Register of Alerts.

Where feasible, outbreak alerts should be recorded and managed using electronic event management systems.

See Section 9 for more information on eIDSR.

4.1 Prepare to conduct an investigation

4.1.1 Mobilize Public Health Emergency Rapid Response Team (PHERRT)

Before embarking on an outbreak investigation, the necessary preparations must be considered. This includes supplying the team with appropriate information and data about the suspected disease, so that everyone knows what to look for, and what precautions are needed. If the disease is known, the team need to pay particular attention to symptoms, case definitions, modes of transmission, diagnostic tests, and control measures, etc.

Mobilize the district Public Health Emergency Rapid Response Team (PHERRT) and make arrangements for investigating the report. The PHERRT is a technical, multi-disciplinary team that is available for quick mobilization and deployment, to support the field response to a suspected, or confirmed outbreak or event. Include the district surveillance focal person for the disease or event being investigated, as well as any other relevant staff who have already been identified and trained to be part of the rapid response team in the investigation planning.

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

It is recommended to have a database of trained public health workers who can rapidly be mobilized to fulfil the following functions:

- Coordination;
- Surveillance;
- Laboratory testing & confirmation;
- Clinician for case management;
- Infection Prevention Control (IPC);
- Water Sanitation and Hygiene (WASH);
- Risk Communication and Community Engagement (RCCE);
- Animal health (as applicable);
- Logistics support; and
- Psychosocial support.

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

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

- Coordination – Team Lead
- Clinician – to oversee case management including Infection Prevention and Control (IPC)
- Surveillance focal person
- Epidemiologist
- Data manager
- Laboratory medical scientist
- Environmental Health Practitioner
- Veterinary Officers/Wildlife Officers
- Risk Communication and Community Engagement (RCCE) focal person

- Psychosocial Support (PSS) officer
- Logistic officer
- Others based on specific characteristics of the outbreak (e.g., expert in water sector if cholera outbreak, or if suspected poisoning from mines, an expert on chemicals or radio-nuclear).

See Section 5 for a detailed description of the composition of other teams for responding to an outbreak and other public health events.

Develop terms of reference together with the team, that define the objectives of the investigation, so that the essential information will be gathered for investigating the outbreak, and implementing the most appropriate and relevant response. Also discuss which stakeholders or parties are involved. National and regional levels may be deployed to support districts in their investigation and response to the outbreak/public health emergency, as per the national policy.

Include standard guidelines and Standard Operating Procedures (SOPs)/methods that are relevant to the disease or condition being investigated (e.g., SOP for collecting the correct laboratory specimen, case management guidelines, case investigation forms, line-listing forms).

4.1.2 Specify tasks and expectations of the people in the PHERRT

Inform health workers about the tasks they will be expected to do during the investigation, and the functions they will support. Specify tentative timelines for the work, and provide positive motivation for doing the investigation. For example, make sure that the investigation team understands the link between the investigation results and the selection of response activities, for preventing additional cases and saving lives. Ensure that all health and non-health staff in the team have access to, and know how to use, the required Personal Protective Equipment (PPE) and universal precautions relevant for the possible cause of the suspected outbreak or event.

4.1.3 Define supervision and communication lines

Plan for how the teams will communicate during an investigation. Prepare a diagram showing who will report to whom, and how information will move within the investigation team, and also between the district and other levels, including the most local level. For example, define who will communicate with the stakeholders, the media and the community. **Clearly specify the communication methods, and how often officials should be informed during an outbreak.** These methods may include: daily updates by telephone, mobile phone, facsimile, electronic mail or conference call. The lines of authority and the role of each staff member on the team, should be shown on the diagram. Define the role of non-health workers and how they should be supervised.

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

4.1.4 Decide 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 for conducting the investigation. Begin the investigation in the most affected place.

Contact nearby health facilities to see if they have seen similar cases, or an increase in cases with the same diagnosis. Involve the community and local health facility staff in planning and conducting 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 authorizations

Observe the appropriate authorizations, clearances, ethical norms and permissions that are required to do the investigation. In addition to official authorizations, make sure to include agreements with local persons of influence in the community, e.g., headmen, councillors, and community leaders.

4.1.6 Finalize forms and methods for collecting information and specimens

Select the variables needed to identify, record and analyse the disease being investigated.

See Annex 4E at the end of this section for a selection of case investigation forms with key variables.

Depending on staff responsibilities, review how to:

- Record case information on a line list for later use in summarizing variables for the analysis of person, place and time;
- Fill out the appropriate forms (CIF and laboratory requisition), label laboratory samples properly and use a unique ID /EPID number for a given case;
- Prepare (and update as needed) an epidemic curve;
- Construct a spot map showing location of geographic variables, such as location of cases and deaths; and
- Develop analysis tables for risk factors, age group, sex, immunization status etc.

4.1.7 Arrange transport and other logistics

Make travel arrangements for getting to and from the site of the investigation, and for travelling during the investigation. Make sure transportation for moving specimens to the appropriate laboratories has been arranged in advance of the team's departure. Other logistics such as medical supplies, vaccines, and PPEs should also be available.

4.1.8 Gather supplies for collecting laboratory specimens

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

If a kit is not available in your district, look at the disease-specific program guidelines, and talk to laboratory staff to find out the requirements for laboratory supplies for proper collection, storage, and transport of relevant specimens.

See Annex 4B at the end of this section.

Use of PPE and disinfection materials is strongly recommended.

See Annex 4C at the end of this section.

See Part II: Section 11 for the disease-specific guidelines for laboratory requirements.

4.2 Verify and confirm the outbreak or event

4.2.1 Review the clinical history and epidemiology

Examine the patient or patients' 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:

- Where do you live?
- When did the symptoms begin?
- Who else is sick in your home, school, workplace, village, neighbourhood?
- Where have you travelled to recently?
- Where have you been living recently, prior to the onset of symptoms (residence at time of infection)?
- Were you visited by anyone recently?
- Who took care of you when you started feeling sick?
- Have you been in contact with sick or dead animals recently? (both domestic and wildlife for zoonosis)
- Have you been in contact with any sick person or dead body?
- Has anybody recently died in the community you live in?
- Did you participate in the burial ceremony (What role did you play?)
- For suspected 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 Part II: Section 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 at the end of this section for information on how to pack samples using a triple package technique.

NOTE: 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; or food samples for foodborne outbreaks).

Review laboratory results with the relevant investigation team members, such as clinicians and laboratory persons at the health facility. Check whether the laboratory results are consistent with the clinical findings. Seek additional assistance from the 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 has occurred, and having verified the correct diagnosis, the next crucial step is to define what constitutes a case in this investigation.

See Section 11 for a list of Standard Case Definitions for most IDSR priority diseases.

In specific outbreaks, where a case definition might be available, other details to be included in the case definitions are also necessary, and these include: geographical location, attendance at an event, or travel to a certain location. If a new disease is encountered, which is not listed in Part II: Section 11, an operational case definition will have to be developed. 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

Isolation is a critical step in limiting the spread of diseases, as well as keeping health facilities open, and healthcare workers available. Use the case definition to determine whether to isolate cases. Depending on the suspected disease, immediate isolation may be required to protect staff, patients, and community members. Ensure that 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 at the location where patients are being treated. Provide the health facility with advice, support, and supplies.

Use universal standard infection prevention and control precautions 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.

4.3.3 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
Search for additional suspected cases and deaths in the registers at the health facilities where cases have been reported. Look for other patients who may have presented with the same, or similar signs and symptoms, as the disease or condition being investigated. Health workers should also be instructed to search for similar cases in neighbouring health facilities, and in health facilities the person may have passed through, while travelling.

See Annex 4D at the end of this section for instructions on conducting a records review.

Make sure to follow up any cases with similar signs and symptoms in patients 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, such as parties, family outside the country, visiting a zoo, church, poultry farm, laboratory, or hunting sites. Also talk to other informants in the community such as schoolteachers, veterinarians (to know about the animal health situation), farmers, and community leaders.

The areas for the search may be influenced by the disease, its mode of transmission, and factors of risk related to person, place and time. 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 similar to 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 were any recent deaths. If yes, find out what the signs and symptoms were of the person(s) that died. Enquire about the people that took care of these people when they were sick and also the preparation of the dead, before and during the burial ceremony. Collect information that will help to describe the magnitude and geographic extent of the outbreak.

Refer newly identified cases to the health facility for treatment.

See Annexes 4E and 4F at the end of this section for examples of forms for recording and following-up of contacts for additional cases.

4.4 Develop a line list and record information about the additional cases

For each new case that fits the surveillance case definition, either in the health facility register or in searches from the community, **record the collected information on a line list register,** as well as in the case-based reporting form or other recommended form. Where possible, include geo-mapping. A line list register will keep track of pertinent basic data for cases and potential cases as they are identified.

See Annex 4E at the end of this section for a sample line list register.

List any contacts on the contact listing form and ensure that they are monitored daily for the required time, for signs and symptoms of the disease.

See Annex 4F and 4G at the end of this section.

Record information of all cases on a case investigation form.

See Annex 2A at the end of this section for an example.

Record at least, the following:

- The patient's name, physical address, occupation, location and village or neighbourhood and geo-coordinates. If a specific address is not available, record information that can be used to contact a patient if additional information is needed, or to notify the patient about laboratory and investigation results.
- The patient's age and sex. This information is used to describe the characteristics of the population affected by the disease.
- The date of onset of symptoms and date the patient was first seen at the health facility.
- The status of the patient whether dead or alive. If dead, record date of death.
- Relevant risk factor information such as immunization status, if the disease being investigated is a vaccine-preventable disease; occupation if you suspect occupation is related to that particular outbreak, or travel history if disease is imported.
- The name and designation of the person reporting the information.
- Some diseases have their own more detailed case investigation form.

See Section 11 (Annexes) for detailed forms outlining particular information for investigating specific diseases.

- Complete the case investigation form for any new cases and record the details on the line list.

See Annex 2A and Annex 4E respectively, at the end of this section.

4.5 Analyse data about the outbreak

Data about the outbreak is analysed and re-analysed many times during the course of an outbreak.

See page 158 in Section 3, for a description of methods for the analysis of summary data.

During the initial analysis, summarize the outbreak or events and look for clues about where the outbreak or event is occurring, where it is moving, the source of the outbreak (from a single source, for example, a well or a funeral, and the persons at risk of becoming ill, e.g., young children, refugees, persons living in rural areas, etc.)

Present the data, taking into account person, place and time analysis in the following way:

- Draw a histogram representing the course of the disease (an "Epi" curve).
- Plot the cases on a spot map.
- Make tables of the most relevant characteristics for cases (e.g., comparing age group with vaccination status, sex ratio, comparing type of occupation in relation to cases etc.)
- Calculate case fatality rates.

See page 166 in Section 3, for more information on how to calculate the case fatality rates.

- Apart from case fatality rates, in an outbreak situation, **attack rates may also be calculated.**

See page 166 in Section 3, for more information on how to calculate the attack rate.

4.5.1 Interpret the analyzed results

Review the results of the analysis while identifying potential risk factors about the outbreak.

For example:

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

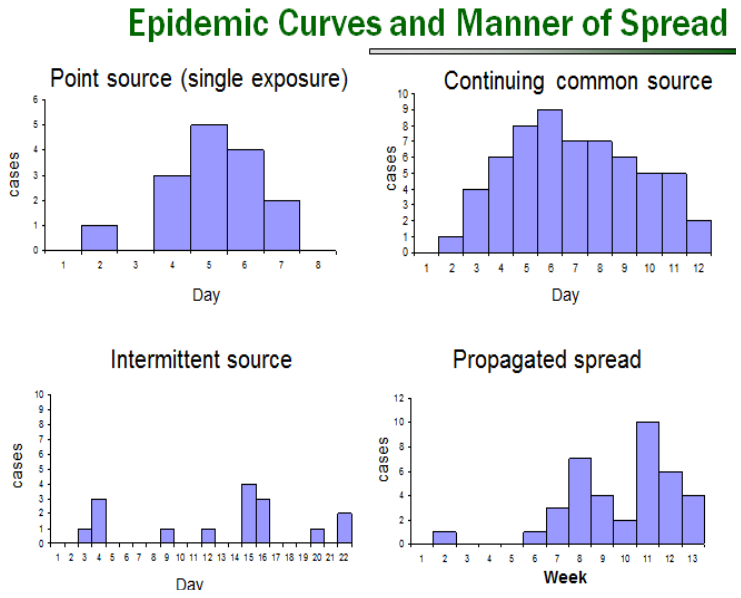
I. Interpret the time analysis results

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 the related incubation period.

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

Below are some examples of the shapes of epidemic curves, and their possible interpretation.

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



II. Interpret the place analysis results

Use the map to:

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

III. Interpret the person analysis results

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

An example of data analysis by person (age) showing how the results could be used to plan for interventions is shown in the table below. Table 4.1 shows highest rates of disease among persons aged 15 years and above.

Table 4.1: Cholera attack rate by age group, Mankhowkwe Camp, Malawi, March-May 1988

Age group	Number of cases	Population	Attack rate (%)
< 5	131	5303	2.5%
5-14	261	12351	2.1%
> 15	392	12091	3.2%
TOTAL	**784**	**29745**	**2.6%**

Source: Reproduced with permission of the publisher, from Moren, et al, 1991

V. Analyse data and generate hypothesis

- Conduct a descriptive analysis of 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 given outbreak. (e.g., in Table 4.1 above, one might hypothesize that the older the patient, the more likely they are to fall ill, and then determine if age is associated with illness.)
- Using descriptive analysis to generate a hypothesis of an outbreak.
- To test a hypothesis, one must use an analytic epidemiology process to answer questions of how and why the population was affected.

VI. Test and refine hypothesis with analytic study

- Based on descriptive epidemiology and situation, select appropriate study design;
- Obtain resources to conduct and analyse study; and
- Draw conclusion from study and as needed refine hypothesis.

In doing analytic studies, there are various study designs which can be used. These include case control studies, cohort studies or experimental studies.

See Annex 4I at the end of this section, for the example of an analytical study (case control) to test hypothesis.
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. Also prepare situation reports (SitReps) of the given outbreak, and share with the relevant stakeholders.

See Section 7 for a description of the various channels of communication during an outbreak.

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

- Situation is confirmed as an outbreak or public health problem.
- Population affected and at risk.
- Possible causes of the outbreak/ public health problem, laboratory results, source of infection, mode of transmission, attack rate, case fatality rate and possible risk factors.
- Measures already initiated to contain the outbreak.
- Recommendations: For controlling the situation further investigation/studies may be recommended. The district PHERRT should then immediately prepare an outbreak investigation report. This detailed report of the outbreak investigation should be prepared and disseminated immediately to the health facility in the area where the outbreak occurred, district, region, national, and also to WHO.

See Annex 7A in Section 7, for a suggested outline for writing an investigation report.

To understand the spread of the disease, draw a transmission tree starting with the index case. The transmission tree assists in understanding the relative contributions of different settings to the spread of the disease in the given geographical area, and hence regulates the infection transmission and control measures. A transmission chain or tree can be reconstructed using information from the line list, as well as a review of the timeline of dates of illness or contact with

other cases, field investigations, and rapid risk assessment. The transmission tree assists in documenting the routes of transmission in a given geographical area, and hence enables planned interventions.

NOTE: The tree needs to be updated frequently, and if a new cluster of cases starts in any part of the district, task questions to determine any linkage.

See Annex 4J at the end of this section, 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/or 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.

See Section 11 for a description of some of the control measures for each priority disease, and references for further reading.

The objectives of outbreak control measures are:

- Control of source;
- Control of secondary transmission; and
- Prevention of future outbreaks.

NOTE:

- Control measures should be implemented at the first available point in the investigation, and should occur concurrently with other investigation steps. Often, non-specific control measures can be put into place, regardless of the type of disease or source.

- Ensure multi-sectoral engagement throughout the response, i.e. from community level to other non-health stakeholders who might be key for the particular outbreaks. For example, to enforce a by-law as part of the response, the assistance of Ministry of Home Affairs, Immigration, Safety and Security (e.g. Police Officers) , might be needed.

- At some point, during the outbreak setting, the public health response might also include testing new potential countermeasures, including vaccines and therapeutics. The conduct of biomedical research can therefore 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 must be conducted in a scientifically and ethically sound manner, to reach definitive conclusions about efficacy and safety, as expeditiously as possible. It is the role of the national level to liaise with the Research Ethics Committee within the country to provide a useful guide for analogous principles in outbreak 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 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 regional levels should maintain contact with the district for daily updates (cases, deaths, number admitted, number discharged, areas affected, etc.), until the end of the epidemic.

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 variable 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, person, place and time; and
- Monitor effectiveness of the outbreak or response activity.

During investigation, it is important also to intensify surveillance with neighbouring districts to ensure the outbreak does not spill over to another district. It is important to share information, and also plan for joint surveillance and response activities.

Neighbouring districts may also initiate the establishment of the 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 assessments at each stage of the outbreak. These assessments are used to focus the interventions.

The risk assessment should include:

- An evaluation of the susceptibility of the population and potential for spread of the event, both in the affected as well as neighbouring areas.
- An evaluation of the risk of further transmission, morbidity and mortality. Factors that can be taken on board include population characteristics such as size, density, movement, and setting; under five mortality rates; period of the year (considering potential for seasonal outbreak), and plans for any festivals or other social events that will result in increased opportunities for spread; and access to health services etc.

A risk assessment should be repeated as new information becomes available. It may also be repeated on a regular time schedule. 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 the future.

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Annex 4A: District register of suspected outbreaks and alerts

Republic of Namibia

Ministry of Health and Social Services

District register of suspected outbreaks and alerts

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

Condition or Disease or Event				
Source of suspected outbreak or rumour (newspaper, telephone etc.)				
Number of cases initially reported				
Number of deaths initially reported				
Location (Health Centre)				
Date district was notified				
Date suspected outbreak was investigated by the district				
Result of District investigation (Confirmed, Ruled Out, or Unknown)				
Date outbreak began				
Date onset Index case				
Date crossed threshold or first cluster				
Date a case was first seen at a health facility				
Date specific intervention began				
Type of concrete intervention that was begun				
Date district notified national level of the outbreak				
Date district received national response				
Comment (include if sample taken and results)				
Name and signature				

Annex 4B: Checklist of laboratory supplies for use in an outbreak investigation

Republic of Namibia

Ministry of Health and Social Services

Laboratory Supplies Checklist

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

_____Liquid hand washing soap/Alcohol-based hand sanitizer
_____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
_____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
_____Swabs (nasopharyngeal, oropharyngeal etc.)
_____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

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

For packaging and transporting samples:

_____Cold box with frozen ice packs or vacuum flask
_____Cotton wool for cushioning sample to avoid breakage
_____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
_____Marking pen to mark tubes with patient’s name and ID number (if assigned by the district)

Reagents and supplies for testing:

_____Reagents
_____Media (MacConkey, Blood agar)
_____others

Appropriate personal protective equipment (PPE) (for all EPR diseases such as VHF, suspected Avian iInfluenza, etc.)
In some events which present with fever, it might be worthwhile to carry Malaria rapid diagnostic kits (mRDT,) if these are not available in a nearby health facility.

Annex 4C: Recommended list of Personal Protective Equipment (PPE)

Republic of Namibia

Ministry of Health and Social Services

Recommended list of Personal Protective Equipment (PPE)

Instructions: The following equipment should be available for the personal protection of all staff investigating a suspected case of highly infectious disease (e.g., Viral Haemorrhagic Fever, Ebola, Avian Influenza etc.) (See guidelines on how to use and select PPE at the end of this section). The PPE should be stored at regional level, for distribution to the districts. Adequate PPE should be provided to high risk regions/districts which are likely to report these specific events, or which have been identified to be at risk through risk assessment.

See Annex 5A for other equipment 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 surgical/laboratory head cover	100 surgical/laboratory head covers
2 pairs of goggles	50 pairs of goggles
1 pair of rubber gloves	100 pairs of rubber gloves
1 mask N95	200 N95 masks
1 boot cover*	0
1 box 50 pairs of examination gloves	800 pairs of examination gloves
1 plastic re-usable apron	20 plastic re-usable aprons
1 pair of gumboots	20 pairs of gumboots
1 hand sprayer	2 x 1.5 litres hand sprayer
1 back sprayer	1 back sprayer of 10-12 litres
Specimen containers	
Scotch tapes	3 rolls Scotch tape
Anti-fog for goggles	3 bottles Anti-fog
Chlorine	
* **Not essential**	

Annex 4D: How to conduct a register review

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 the increase in number of cases.

The register should be used for:

- Any health facility. Give priority to government health facilities.
- Referral, intermediate or training hospitals and paediatric wards, because they receive referrals from other health facilities.
- Health centres and clinics that serve remote areas and high-risk populations. For example, nomadic groups, refugees, or areas without regularly scheduled health services e.g. outreach.

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

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

3. Arrange to conduct the register review

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

4. Identify sources of information

During the visit, depending on the priority disease, condition or event being investigated, check in-patient registers for the paediatric, medical and /or other wards. The inpatient register for all of the wards is a good source, because it lists all patients admitted to the wards. Annual summary reports are not always accurate, and outpatient registers often include only a provisional diagnosis.

Review the system and procedures used by health workers 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 physical address;
- the signs and symptoms;
- date of onset of symptoms and outcome (for example, discharge/recovered or date of death, if relevant); and
- immunization status, if appropriate to this disease.

If the health facility does not keep at least the minimum information, consult and advise with the staff on how to strengthen their record keeping so that the minimum information is collected.

(continues on next page)

5. Conduct the record review at the scheduled date and time.

Visit the selected wards as scheduled, and review 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. Enquire 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 this 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 the prevention of priority diseases and conditions. Also emphasize 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

Republic of Namibia

Ministry of Health and Social Services

Sample Line List

no.	Patient Name	District	Ward	Location	Age	Sex	Occupation	Date of Onset	Date seen at HF	Diarrhoea Yes/No	Vomiting Yes/No	Severe 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																				

Republic of Namibia

Ministry of Health and Social Services

Contacts recording sheet

Contact's recording sheet filled in by_____Case name:_____Case number (if assigned):_____
Case's village/neighbourhood:_____ Community leader/ Village headman:_____
District:_____Town:_____Region:_____
Date of symptom onset:____/____/____Hospitalized (Yes /No) Name of Hospital_____Found in the community (Yes/No) Date of Admission:____/____/____

Surname	First Names	Relation-ship with the case	Health worker (Y/N), if yes which facility?	Age (yrs)	Sex (M/F)	Phone number	Head of household	Village/ neigh-bourhood	Community leader/ / village headman	District/ Town	Type of contact (1, 2 or 3, list all)	Date of last contact	Last date for follow-up	1st Visit	Outcome

Contacts are defined as:
1 - sleeping in the same household with a suspected, 2 - direct physical contacts with the case (dead or alive), 3 - has touched his / her linens or body fluids, 4 – has eaten or touched a sick or dead animal

Republic of Namibia

Ministry of Health and Social Services

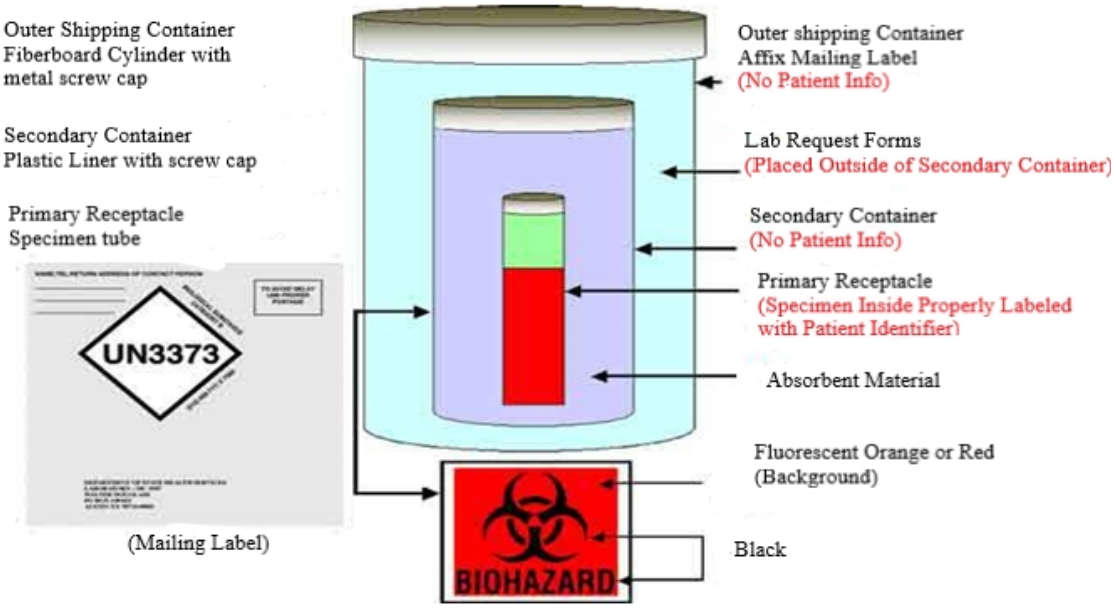
Contact Tracing Form

Contact tracer's name:_____Case name:_____Case number (if assigned):_____
Village/location:_____ Community leader/ Village headman:_____
District:_____Town:_____Region:_____

CN	Surname	First Name	Age (yrs)	Sex (M/F)	Phone number	Date of last contact	Day of Follow-up																			
							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

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

Annex 4H: Types of triple packaging of samples during an outbreak



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, were at greater odds of having Cholera. Odds ratio (OR) = 3.07; 95% Confidence Interval (C.I) = [1.155; 8.163]; P = 0.020) 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 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 obtained from: https://www.cdcfoundation.org/sites/default/files/upload/pdf/2011CholeraOutbreakReport.pdf

Annex 4J: 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:

I. 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 healthcare workers (cases 2 & 3). His illness was later laboratory-confirmed as the novel coronavirus (3).

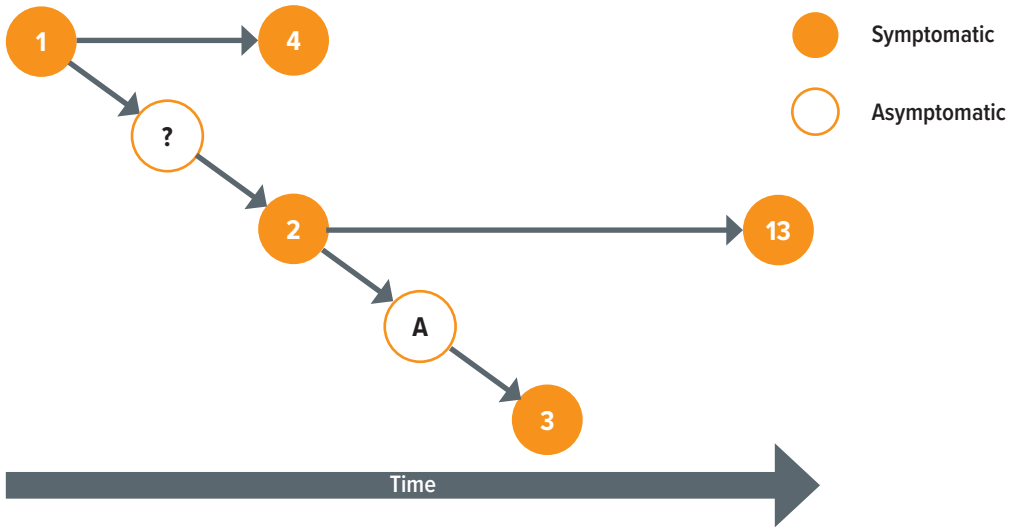
II. The second case was a 30-year-old male nurse in the CCU at Zarqa hospital. His symptoms started about 29 March 2012. He did not travel or have contact with animals in the 10 days prior to his illness, although he was in close proximity to the first case in the CCU. On 8 April, case 2 was admitted 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).

III. 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 visited from Saudi Arabia (3).

IV. 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 did not travel or have contact with animals in the 10-days prior to his illness. His household members did not report any illness (3).

V. Cases 5 through 13 occurred in the second phase of the outbreak, with the 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 healthcare workers travelled or had contact with animals. The healthcare 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 created as follows:



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

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SECTION 5

PREPARE TO RESPOND TO OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

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5. 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 (IHR 2005). Being prepared to detect and respond to such an event is an essential role of the district, regional and national levels.

Preparations for public health events include:

1. Establishment of the Public Health Emergency Management Committees (PHEMC) at all levels.
2. Establishment 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 least at national level, or a similar coordinating structure, also at regional and district levels.
3. Develop policies, plans and procedures for operations, mapping available resources, estimating required supplies and procuring them, and conducting simulation exercises to test systems.
4. Identifying and training key members of Public Health Emergency Management sub- committees/pillars and Public Health Emergency Rapid Response Teams (PHERRT).

The plan 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 Multi-Hazard plan is the overarching plan and should be complemented by a PHEOC plan, and event or Incident Specific Plans (ISP). The PHEOC plan guides the operations of the command and coordination centre, outlining standard operating procedures of how each functional area operates and works together. The ISP addresses high priority emergency events based on risk analysis, and is always annexed to the Multi- Hazard plan.

5.1 Establish a permanent Public Health Emergency Operations Centre (PHEOC)

Response to public health events is successful if there is coherent, effective and efficient coordination of the various actors, representing a multi-sectoral team in the context of One Health. This approach ultimately minimises the impact of the event in the community. The IHR (2005) requires that State Parties develop, strengthen and maintain their capacity to respond promptly and effectively to public health risks and public health emergencies.

National level should establish the PHEOC to act as a command and control centre to enhance coordination and to oversee public health emergency preparedness and response activities. Legislation or an executive directive should be developed to mandate, and allow MoHSS to establish and manage the PHEOC. This mandate outlines the roles and responsibilities of the MoHSS, and lays out the coordination mechanisms with overall national disaster management resources, together with a funding mechanism to enable the operations of the PHEOC. The PHEOC, acts as a command and control centre, and a hub for the coordination of information and resources to support incident or event management activities. This enables a coordinated response to emergencies that involve health consequences and are a public health threat.

The PHEOC will need to develop the following essential elements so as to be fully functional, to support the preparation and response to emergencies:

i. plans and procedures for operations;
ii. telecommunication technology and infrastructure to enable timely communication;
iii. information system to support informed decision making; and
iv. trained personnel.

The PHEOC monitors events using various sources of data; facilitates and improves communication between public health and emergency management personnel, and facilitates coordination with multiple response partners. The PHEOC should feed into the National Disaster Risk Management EOC to manage escalated events of national magnitude. It is highly recommended that the PHEOC is positioned at the highest level, where there is already a body mandated to coordinate public health emergencies. In Namibia, the PHEOC is situated in the division of Epidemiology under the Health Information and Research Directorate (HIRD), and is answerable to the Executive Director.

During public health emergencies, the PHEOC, is activated, and guided by the Public Health Emergency Management Committee (PHEMC), 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), to manage and coordinate the response, by providing a common hierarchy. In the context of IDSR, a sub-committee on health emergencies is formed at strategic level, and will assemble on a set schedule. The IMS is represented by the PHEMC at technical level during the activation of PHEOC, as well as the National Public Health Emergency Management Subcommittees/pillars which are also present at 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 the effectiveness of a PHEOC. It can be modular (i.e., it can be partially or fully activated), according to the situational needs.

Please refer to WHO Framework for a Public Health Emergency Operations Centre.

Most importantly, IMS should be functional at all levels of the health system delivery (national, regional and district). Once the IMS is activated during public health emergencies, the PHEMCs meet daily and weekly, or as determined by the prevailing situation. Its function is to facilitate coordination, communication and information sharing, and put in place containment measures while at the same time facilitating the deployment of the Public Health Emergency Rapid Response Team (PHERRT). During activation, the PHEOC will also help in the flow of information horizontally and vertically to the respective departments, relevant sectors and partners for smoother relief operations.

Having a centre for command and control is essential for preparedness and response to public health events. If resources allow, regions and districts will need to have PHEOCs with basic facilities, that support the direct coordination of preparedness and response to public health emergencies. They not only facilitate real time communication and information between various stakeholders at their levels, but also ensure that there is a mechanism for information sharing with the national level PHEOC. Namibia has an existing coordinating mechanism at subnational level (region and district), which also acts as a command and control centre (i.e. the District PHEMC and the associated management subcommittees use the same IMS structure of the PHEOC during public health emergencies. To continue supporting the coordination of preparedness and response activities at these levels, the district PHEMC should be used to ensure real time communication and information sharing between the various actors at these levels and the national level.

When inactive, the PHEOC (Command and Control centre), usually reduces in size, and the respective members of various Public Health Emergency Response Management Subcommittees return to their working stations. The few staff remaining at the centre will then liaise with the respective sections or departments, maintaining plans and procedures, conducting trainings and simulation exercises, routine and event based surveillance activities, as well as maintaining a systematic database of the resources available, and the contact details of important government and non-government officials, international agencies and NGOs.

5.2 Establish national, regional, and district Public Health Emergency Management Committees (PHEMCs)

Public Health Emergency Management Committees (PHEMCs) should be established at all levels - national, regional, and district. The PHEMCs at all levels should work closely with their relevant sectors and stakeholders, to plan and monitor the implementation of public health emergency plans. These are the coordinating committees at their respective levels, and are composed of technical and non-technical members from the health sector as well as other sectors. The role of the PHEMC is to develop and oversee the implementation of emergency preparedness strategies, action plans and procedures.

At national level, the PHEMC will provide policy direction in the implementation and operation of the National PHEOC and will also provide oversight, policy and strategic guidance in the implementation of functional PHEOCs or similar coordination structures or mechanism in regions and districts.

The PHEMC will also mobilise funds for PHEOC development and sustainability. The committee 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, multi-sectoral or multi-jurisdictional emergencies.

5.2.1 Identify functions of the PHEMCs

- Ensure coordination and integration of surveillance and response activities across all levels.
- Develop a national/regional/district 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 emergencies.
- Map available resources (human and material), experts, logistics, including distribution, and finance etc.
- Periodically review and update the plan in response to any changes in technical, managerial or epidemiological situation, or any other identified risk.
- Liaise with National Disaster Risk Management Committee (NDRMC) to ensure a multi-sectoral preparedness and response.
- Establish a community communications plan for sharing information with communities before, during, and after any public health emergency. This plan should include mapping of all communication channels, such as community radio, and internet coverage, 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.
- Coordinate community risk-mapping activities within the district, and ensure all reporting sites are aware of the use of thresholds for reporting acute outbreaks or events.
- Identify and mobilize resources for emergency prevention and control, including procurement of response and communication supplies. There should also be a mechanism to monitor the use of the resources before, during and after the emergency event.
- Ensure that district/regional/national emergency material stockpiles are monitored, procured and updated regularly.
- Enhance linkages with CCHWs to ensure the flow of data for early detection of public health events.
- Coordinate the training of community, health facility, and district/regional/national personnel in emergency preparedness and response.
- Ensure periodic emergency response simulation activities at all levels.
- Coordinate the post-emergency evaluation, and plan to disseminate findings with the affected communities.

- Ensure provision of efficient administrative and financial management support, including human resources, cash flow (by estimating, tracking and approving response-related expenditure), and monitoring and coordinating funding from all sources.
- Ensure that communication technology and information systems are able to support any type of emergency.
- During, public health emergencies, the PHEMC, at national level, will oversee activation of the National PHEOC, and also activate a similar coordination structure at subnational level. There will also be an activation of the IMS structure (i.e., formation of sub-committees/ pillars), and the deployment of the PHERRT.
- Regular meetings should be held to strengthen preparedness capacity (e.g., training of CHWs etc.), even during times of non-public health emergencies.

5.2.2 Identify members of the PHEMCs

The PHEMC should include a mixture of representatives from the public, NGO and private sectors, to match the functions listed above.

For example, in the district level committee, participants from the public sector may include:

- Local police station commander
- Local authority representative
- District Senior Medical Officer
- Local state veterinarian /agricultural services or equivalent
- District Primary Health Care Supervisor
- District Surveillance focal person
- District Environmental Health Practitioner
- Ministry of Education, Arts and Culture representative
- Academia representative, if applicable
- Psychosocial representative
- District laboratory representative for both human and animal health
- Pharmacist
- Community development committee representative
- Immigration representative, if applicable
- Ministry of Information and Communication Technology representative
- Ministry of Urban and Rural Development representative
- Correctional Services representative, if applicable
- Ministry of Defence representative, if applicable
- Influential leaders: constituency councillor, village headman, religious leader, etc.

NOTE: At regional and national levels, an equivalent of the above individuals should be used in order to ensure a comprehensive multi-sectoral structure. At national level, consider including representatives from other key relevant ministries, heads of agencies, or research institutes (human and animal).

Members of the IHR National Focal Point should always be part of the national team composition. Include representatives from non-governmental organizations in the area, with healthcare activities:

- Community health programs and faith based health facilities;
- Local NGOs;
- Civil society organizations (e.g., Namibia Red Cross Society or similar agencies);
- Other health development partners; and
- UN organizations.

From the private sector, involve participation from:

- A representative from private health sector;
- A representative from private laboratories (human and animals);
- Pharmacists;
- Representatives of the business community;
- Research and training institutions; and
- Professional associations.

NOTE: The PHEMC should have a chairperson (e.g. the highest placed political person in the district)

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:

- Regularly review the implementation of activities of the National Action Plan for Health Security (NAPHS).
- Exchange information on risk monitoring. 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. For example, vaccination among livestock might be crucial if human cases of anthrax or rift valley fever have been detected, as a signal for asymptomatic diseases among animals.
- Review disease trends and updates on preparedness steps.
- Review the level of preparedness at the beginning of each epidemic season (e.g, before the period when cases of meningitis increase).
- Monitor stocks of equipment for event investigation and response.
- Share conclusions and recommendations of these meetings with respective committees at all levels.
- Organize simulation exercises/drills to test the effectiveness and efficiency of the multi-hazard plans.

NOTE: It should be noted that the PHEOC serves as a hub for coordinating these activities. If not, a similar coordination structure or mechanism will serve the same purpose.

During an emergency or outbreak response, the PHEMC should:

- Meet as soon as the outbreak or event is established.
- Conduct a situational analysis, and grade the level of the event.
- At national level activate the PHEOC, or similar coordinating structures at subnational levels, and deploy PHERRT to the field to investigate and respond to the event. They will also activate the Public Health Emergency Management pillars.

See Section 5.3 for a detailed description of the technical teams, with their roles and responsibilities.

- Assess the need for, and request support from the next higher level when needed. For example, a district will request for support from the regional or national emergency response level, or PHERRT when necessary.
- Meet at least daily at the beginning of an outbreak or event, and weekly as the response continues.
- Regularly review the outbreak response and take action to improve outbreak control actions as indicated.
- Document and communicate outbreak response actions to the next higher level
- Conduct an Intra-action review.

5.3 Establish Public Health Emergency Management subcommittees at all levels

The Public Health Emergency Response Subcommittees are the subcommittees that are formed by the PHEMC to oversee the day to day management of the public health emergencies of the PHEMC committee. They consist of technical and non-technical teams. Their role is to oversee daily management of the event/incident and feed the PHEMC committee for decision making.

They are subdivided into technical and non-technical teams, depending on their functions, as shown in Table 5.1 below:

Table 5.1: Functions of Public Health Emergency Management Subcommittees

Subcommittee	Members (Experts, Organizations)	Description of tasks
Coordination, planning and leadership	**National/Regional/District levels)** • Overall chair: ED/ Health directors/ SMOs **Members:** • All pillar leads • Appointed members • Partners and stakeholders supporting coordination	• Coordinate all aspects of the operations response, planning and management including: assigning responsibilities. • Designing, implementing and evaluating control intervention. • Co-ordinate the development and update of incident response plan and overall liaison with partners. • Daily communication through situation report about the evolution of the outbreak. • Operational support including mobilization of resources. • Responsible for staff wellbeing, security. • Evaluate the situation (information gathering and analysis), assessment of the options for dealing with it, and keeping track of resources.

1. Finance and Administration		
Subcommittee	**Members (Experts, Organizations)**	**Description of tasks**
Finance	**Chair: Director of Finance and Logistics from MoHSS** **Regional level: Control Officer / Officer** **Members: (National/Regional/District levels)** **Financial advisor** • Accountants • Administrators • Partners supporting finance and administration	• Track expenditure, make payments. • Ensure appropriate cash flow management. • Track material and human resources. • Manage cost, budget preparation, monitoring, and maintenance of administrative records. • Provide budgetary support/ funding for epidemic preparedness & response.
2. Logistics		
Subcommittee	**Members (Experts, Organizations)**	**Description of tasks**
Logistics, Human Resources and Supply Chain	**Chair: Logistician/Procurement officer from MoHSS** **Members: (National/Regional/District levels)** • Supplies/ Stores assistants • Pharmacists or dispensers • Technical assistance from the other line Ministries • Partners supporting logistic and HR management • Logisticians.	• Procure equipment and supplies. • Maintain adequate stocks of supplies and equipment. • Arrange for transport and communication systems. • Liaise with other agencies for logistic support. • Provide accountability for all resources procured and used during epidemic preparedness & response. • Procure items as per specifications as provided by pillars (e.g. PPE) • Recruitment of personnel (e.g. surge staff) as required by the response Track human resources.
3. Technical Operations Subcommittees: Chaired by Operations Lead (Coordinates all the activities of the response)		
Subcommittee	**Members (Experts, Organizations)**	**Description of tasks**
Case Management and Infection Prevention & Control (IPC)	**Chair: Medical Doctor from MoHSS** **Members: (National/Regional/District levels):** • IPC focal persons • Medical Officer • Nurses • Medical Superintendents-in charge of hospitals • Veterinarian/Agricultural services or equivalent • Environmental Health Practitioner/ • Laboratory Medical Scientist (both human and animal health) • Pharmacists • Representative from private health sector • Representative from private laboratories • Professional associations representatives • Partners supporting case management and IPC	• Provide comprehensive patient care. • Ensure availability of guidelines and SOPs for case management and infection prevention and control in all health facilities, including the private sector. • Strengthen isolation facilities and reinforce infection prevention and control measures. • Conduct risk assessment of health personne.l • Ensure appropriate medical care is being provided to patients/animals. • Provide ambulance services – transportation of suspected cases from the community using the defined referral system. • Collect data from all treatment facilities (if available) and submit to the surveillance sub-committee. • Provide guidelines for appropriate disinfection of homes and environments with suspected/ probable/ confirmed cases/ deaths of an infectious disease. • Provide guidelines for conducting and supporting safe burial of dead bodies from isolation facilities and community deaths. • Train and provide refresher trainings for health workers in the isolation facility and other health facilities in the affected districts. • Ensure adequate stockpiles of equipment at all times.

Subcommittee	Members (Experts, Organizations)	Description of tasks
Surveillance and Laboratory	**Chair: Surveillance focal person or an Epidemiologist/ Public Health Specialist** **Co-chair: Laboratory Focal Person** **Members: (National/Regional/District levels):** • Surveillance Focal persons • Environmental Health Practitioner • Epidemiologists • Laboratory Medical Scientist • Port Health Officer • Community Health Workers • Local NGOs at community level • Civil Society Organizations e.g Namibia Red Cross Society • Representative from private health facilities • Representative from private laboratories • Pharmacists • Research and training institutions • Animal Health Surveillance Officer • Veterinarian • Partners supporting surveillance and laboratory.	• Ensure availability of all surveillance guidelines and tools in health facilities. • Ensure the use of outbreak case definitions. • Conduct active case finding, case investigation, contact tracing and follow-up. • Verify suspected cases/ alerts/ rumours in the community. • Ensure proper completion of case investigation forms. • Ensure proper collection, packaging, transportation, and testing of specimens from suspect/ probable cases/ deaths. • Coordinate the communication of test results to the reporting team. • Conduct data management and provide regular epidemiological analysis and reports. • Train health personnel in disease surveillance. • Maintain close linkage with burial, infection control and social mobilization groups. • Conduct cross-border surveillance.
Risk Communication and Community Engagement (RCCE)	**Chair: Health Programme Officer for Risk Communication /Primary Health Care Supervisor / Health Programme Officer for Family Health** **Members (National/Regional/District levels):** • Risk Communication Expert • Police Officers • Public Relations Officer • Environmental Health Practitioners • MICT Representative • Community Development Officer • Community leaders (religious, traditional, political etc) • Representatives of business community • Partners supporting RCCE.	• Ensure availability of Information Education Communication (IEC) materials in all languages. • Develop risk communication strategy. • Conduct rapid assessment to establish community knowledge, attitudes, practices and behaviour on prevailing public health risks/ events. • Organize sensitization and mobilization of communities. • Serve as focal point for information to be released to the press and public. • Liaise with the different pillars, local leadership and NGOs involved in activities on mobilizing communities. • Liaise with media houses for information dissemination, including private media houses. • Counteract infodemic.
Mental Health and Psychosocial Support	**Chair: Psychologist/ Social Worker (National/ Regional/District levels):** • Counsellors • Mental Health Clinicians • Clinical Psychologists • Social Workers • Partners supporting psychosocial services.	• Provide psychological and social support to suspected/ probable/confirmed cases; affected families and communities. • Provide care and psychological support to the response team and affected communities. • 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 officer or Water engineer (National/Regional/District levels):** **Members:** • Environmental Health Practitioners - both private and public sectors • WASH Specialist • IPC Focal Person • Ministry of Agriculture, Water and Land Reform • Ministry of Urban and Rural Development (Sanitation) • Partners supporting WASH e.g., UNICEF etc	• Conduct environmental health risk assessment for the outbreak. • Ensure provision of clean water and improved water management at household and community level. • Plan for sanitation improvement campaign. • Plan for improved hygiene practices including hand washing, food hygiene and sanitation.

Subcommittee	Members (Experts, Organizations)	Description of tasks
Vaccination	**Chair: EPI manager** **Members: (National/Regional/District levels):** • Pharmacists • PHC Supervisor • Medical Officer • Nurses • Reproductive and Child Health Officer • Community leaders • Partners supporting vaccinations e.g., UNICEF, WHO etc.	• 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 mobilisation. • Conduct vaccination and post-vaccination campaign validation exercises.

5.4 Establish Public Health Emergency Rapid Response Teams (PHERRTs) at all levels

The Public Health Emergency Rapid Response Team (PHERRT) is a technical, multi-disciplinary team that is readily available for quick mobilisation 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 the environment, irrespective of origin or source. PHERRTs should be established at the district, regional, and national levels.

See Section 4.2 on the composition of the PHERRT.

Roles and responsibilities of the national, regional and district PHERRTs:

- Investigate rumours and reported outbreaks, verify diagnosis and other public health emergencies including laboratory testing.
- Collect samples from new patients and old ones if necessary (human, animals, food, water, soil etc).
- Follow-up by visiting and interviewing exposed individuals, establish a case definition and work with the community to find additional cases.
- Assist in creating mechanisms for the implementation of IPC measures.
- Assist in generating a line list of the cases, and perform descriptive analysis of data (person, place and time), to generate a hypothesis, including planning for a further analytical studies.
- Propose appropriate strategies and control measures, including risk communications activities.
- Establish appropriate and coordinated risk communication system through a trained spokesperson.
- Coordinate rapid response actions with national and local authorities, partners and other agencies.
- Initiate the implementation of the proposed control measures, including capacity building.
- Conduct ongoing monitoring, and evaluation of the effectiveness of control measures through continuous epidemiological analysis of the event.
- Conduct risk assessments to determine if the outbreak is a potential PHEIC.
- Prepare detailed investigation reports to share with PHEMC.
- Contribute to ongoing preparedness assessments, and the final evaluation of any outbreak response.
- Meet daily during outbreaks, and quarterly when there is no outbreak, or as appropriate.
- Conduct and 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 also to engage key policy and operational partners. This includes mapping and assessing risks with the potential to affect community health in the catchment area. This mapping must address all acute health risks, and not be restricted to communicable diseases. Identification and mapping should be conducted across all levels, from national through regional, to district. An evaluation of drinking water sources or food storage methods, and animal breeding areas and movements should be included.

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 information is useful when developing MoHSS Strategic and annual plans, considering supplies, transport and other resources necessary for the response.

Namibia has used the *WHO Strategic Tool for Prioritizing Risks* (STAR), to assess a wide range of hazards, including the health consequences of natural or human-induced emergencies, the health events covered under the IHR (zoonosis, chemical, radio-nuclear, food safety), and also events occurring in neighbouring countries or regions. This assists the district, regional or national level to develop priorities for the development of contingency plans and specific responses, and can also be used to outline potential needs, to enhance national capacity in terms of preparedness and response. *(Strategic Tool for Addressing Risk, STAR, WHO, DRAFT Version 3.3.1 (December 2019)).* Namibia will also adopt the 2019 Tripartite *Zoonotic Diseases: A Guide to Establishing Collaboration between Animal and Human Health Sectors at the Country Level,* which can be found online at: https://www.oie.int/doc/ged/D12060.PDF).

5.6 Resource Mapping

In preparing for outbreaks, there is a need to undertake resource mapping to identify the available resources in every geographical area. This ensures the prompt mobilization and distribution of such resources, including material and human resources in an outbreak situation. Some of the resources can also be obtained from other sectors in the district, or the region or development partners, and NGOs operating in the respective levels.

5.7 Prepare a multi-hazard emergency preparedness and response plan

All Hazard plans should be developed for the preparedness and response of all national, regional and district levels. These plans 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 strengthen the ability of the national and subnational levels to respond promptly, when an outbreak or other public health event is detected.

This plan should:

- Be based on risk assessments conducted with a multi-sectoral approach, and should specify the resources available for emergency preparedness and response.
- Take into consideration diseases with epidemic potential in the country, region, district, and neighbouring countries.
- Take into account all other events (All Hazard approach) and cover the IHR core capacity requirements of Annex 1 A (Core capacity requirement for surveillance and response IHR (2005), Third edition).
- Take into account PoE activities for strengthening surveillance and response.

- Lay out concept of operations (CONOPS), including clear lines of accountability, decision making authorities and processes, procedures for activation /deactivation, and calls for assistance etc.
- Describe the available surge capacity to respond to public health emergencies of national, regional, and district concern.
- Provide estimates of the population at risk for epidemic-prone diseases and other public health emergencies.
- Clearly indicate which national or reference laboratory will be used for confirmation, for each suspected outbreak.
- Provide estimates of needed quantities of medicines, vaccines, supplies, laboratory reagents, and consumables for each epidemic-prone disease likely to occur.
- Identify training needs, and develop a training plan for all staff, including PHERRTs.

See Section 5.4.

- Describe the procedures and plans to relocate or mobilize resources to support the response.
- Describes the procedures for risk communication.

The plan should be tested before implementation and periodically through simulation exercises.

NOTE: The plan should also include how to institutionalize health facility and community resilience-building, and preventative interventions, based on risk analysis and mapping.

See Table 5.2 on next page.

Table 5.2: Elements of the emergency preparedness and response plan

Key sections of the emergency preparedness and response plan should include:	
1	Designated coordination structures, including sub-committees/pillars.
2	Matrix of key stakeholders and partners supporting health activities [humans, animals (domestic, livestock and wildlife), environment], and their roles and responsibilities.
3	Epidemiology and surveillance activities, including health information management.
4	Steps for carrying out a risk communication strategy including social mobilization.
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 (anti-viral, 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	Immunization 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 Community Engagement.
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 mobilization and procedures to relocate or mobilize resources, including deployment of personnel 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 mobilization of resources such as vaccines, medicines and laboratory supplies. It is prudent to map out available resources to determine the status of the stockpile with respect to pharmaceuticals, PPE and other equipment, and to establish and pre-position stockpile materials before an emergency occurs. While doing the mapping at national level for stockpiling, it is also important to know the regional and global stockpile of various items which can be tapped into during an outbreak.

As a follow up to the public health risk assessment activity, each level from district, and region, to national level should set up a contingency stock of medicines, vaccines, reagents and supplies to ensure prompt management of the first cases without delay. For subnational levels, this is critical before support arrives from the higher levels. Ensure that there are also quick mechanisms for sending supplies from national level to other levels. Regularly and carefully monitor the contingency stock in order to avoid shortages and the expiry of medicines, vaccines, reagents and supplies. Examples of stock management tools are included in the annexes at the end of this section. The content of the contingency stock varies with the nature of epidemic-prone diseases, and the risk of outbreak in the district. Risk assessment activities help to develop a list of minimum materials that should be stockpiled in the districts and at health facilities. If all districts and health facilities cannot be stockpiled with the minimum materials, identify a designated point (clinic, health centre, district), to ensure quick release of these items when needed during an outbreak.

Establish partnerships in advance with other implementing agencies at all levels (national, regional, and district), e.g., NGOs, concerning stockpiles of appropriate medicines, vaccines and other materials.

See Annex 5A at the end of this section, for a suggested list of contingency medicines and supplies.

5.7.2 Conduct stock management for outbreak response

Maintain and pre-position a reliable supply 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 for each relevant supply.

Use an inventory checklist, to assess which supplies are already available for use during a response activity.

See Annex 5B.

If the supplies are already available, determine if they can be set aside for use during a response. If they are not available, can they be purchased or requested through the national system for procurement?

Periodically, for example every 4 months, make sure the supplies are dry, clean, have not expired, or have not deteriorated, and are ready to be used, and mechanisms to assess them are readily available.

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

1. List all required items for carrying out surveillance, laboratory and response, necessary for detecting and responding to priority diseases, conditions and events.

Consider:

   a. Availability of case definition posters; registers, including line list register; as well as required reporting forms/referral forms.
   b. Availability of laboratory supplies, diagnostic reagents and kits.
   c. Specimen collection, storage and transport kits including triple package containers.
   d. Availability of various guidelines for the surveillance and response of specific diseases, including laboratory SOPs.
   e. Availability of case management guidelines, medicines, supplies and other field intervention materials.

2. Make an inventory and note the quantity of each item that is available.
3. Complete and regularly update a stock balance sheet for each item.
4. Observe expiry dates and practice best logistical practices for packing, shipping, storing and disposing of supplies and materials.
5. Establish a critical or minimum quantity for each item that would need to be on hand for an investigation or response activity. Consider logistic and epidemiologic factors in establishing minimum quantities.
6. Monitor the stock balances against the critical quantity established.
7. Report regularly on the IDSR stock situation.

See Annex 5C at the end of this section, for an example of a stock item transaction and balance sheet.

5.7.3 Update human resources available for response, as well as other logistics support for response of public health events at all levels

- Annually update the list of all surveillance focal persons from all reporting sites, including the community level.
- Update roster of public health emergency rapid response teams.
- Update other logistics e.g., vehicles, fuel, phones and airtime etc.
- Update list of trained health staff, including laboratory staff.
- Map laboratories that have sufficient quality control standards and that meet the required standards to ensure reliable results, including availability of SOPs which defines biosafety procedures for collecting, packaging, labelling, shipping, manipulating and discarding samples. Map the specimen referral/transportation network, including schedules, and if this is not in place, create a mechanism to ensure the prompt referral of specimens, once an outbreak is suspected.
- 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.
- Develop a patient referral system for highly infectious diseases, including transportation mechanisms.
- Take stock of the SOPs of response pillars at the different levels.

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Annex 5A: Essential stock items for responding to outbreaks

See Annex 4B for a detailed list.

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
	Alcohol-based hand sanitiser		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 support-ive 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		Cookware
	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 (pump and fogger)		Lab: See Annex 4B
Ribavirin	Bromadione			Lamps
Ringer lactate				Maps
Oseltamivir (for H1N1				Paraffin
				Phones
				Plastic sheets
				Power generator
				Sprayers

Annex 5B: Stock situation report

Republic of Namibia

Ministry of Health and Social Services

Emergency Preparedness and Response: Stock Situation Report

Emergency Preparedness and Response: Stock Situation Report						
Year:						
Report day (day/mm/yyyy):_____/_____/_____						
Reporting period (Daily/weekly/monthly/quarterly):						
Reporting site name:						
District:						
Region:						
Item Description	**Opening Stock**	**Quantity Received**	**Total Stock**	**Quantity Issued**	**Stock Balance**	**Observations, Decisions and Recommendations**
Reporting Person's Name:_____ Title:_____ Signature:_____						

Annex 5C: IDSR stock item transaction and balance sheet

Republic of Namibia

Ministry of Health and Social Services

IDSR stock item transaction and balance sheet

Instructions: Use one sheet per stock item, and update the sheet every time any transaction takes place.

IDSR Stock Item Transaction and Balance Sheet (Insert item description)													
Laboratory or Warehouse Name													
Presentation (Unit of purchase)													
Expiry date													
Manufacturer													
Batch number													
Location in store													
Airway bill													
Allotment number													
Shipment & operations cost (USD)													
Transaction Date (Day/Month/Year)													
Donor or Supplier													
Quantity issued													
Destination or Beneficiary													
Stock Balance													
Signature (Name and function)													
Observations / Remarks													

Annex 5D: Assignments for the committee to develop the EPR plan

Task	Assigned member(s) from the committee
Designated coordination structures, including committees	
Organizational framework of key stakeholders and partners supporting health activities (human, animal, environment, etc.), and their 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 community engagement	
Operational actions according to expected phases of the epidemic	
Laboratory specimen collection, handling, transportation, processing and information management	
Case management, including treatments (anti-viral, 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 community engagement	
Capacity building including required training, sensitization 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 mobilization and procedures to relocate or mobilize resources to support response	

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SECTION 6

RESPOND TO OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

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6. Overview on how to respond to outbreaks and other public health events

The goal of IDSR is to use data for a public health response or action. This section describes steps for declaring an outbreak, activating the response structures and conducting a public health response. It also provides general guidance for the immediate response actions for leading causes of illness, death and disability.

See the WHO guidelines at the end of this section, for information on responding to chemical, biological and radio-nuclear events.

When an outbreak, acute public health event, or condition of public health importance is detected, an investigation should take place to determine the cause of the outbreak as described in Section 4.

See Section 4.

The results of the investigation should guide the response. Most disease prevention and control programs implement successful response actions, such as conducting a mass immunization campaign for vaccine-preventable diseases. Other response actions may include the strengthening of nutritional support and feeding practices for children with malnutrition, or administering anti-malarial, antibiotic or antiviral treatments as indicated. Successful responses are carried out with community involvement and often include community education, and a behavioural change component.

The effective coordination of response activities is also critical, as many stakeholders are involved. It is essential that all stakeholders be identified in advance, including their areas of support and their roles and responsibilities, to enable a smooth response during an epidemic or any other public health event. The role of the PHEMC (through the activation of the PHEOC), is to ensure the effective coordination of the response activities across different sectors and donors, as outlined in Section 5.

See Section 5.

Regardless of the specific recommended response, the role of national, regional or district levels in selecting and implementing response actions, is essential for safeguarding the health and well-being of communities in the respective levels.

Under the IHR (2005), districts are required to be involved in response to hazards related to 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 district level, the head of the district health management team should notify the region and subsequently the national level, Epidemiology Division. Depending on the event, the IHR NFP at the national level will assess whether the event is a potential Public Health Event of International Concern (PHEIC) using the IHR decision instrument. The IHR NFP will liaise with the Executive Director of MoHSS, to notify the WHO country office as well as sending an alert to nearby districts/regions where applicable, about the outbreak, to ensure coordinated response efforts. While waiting for confirmation of laboratory diagnosis, there may be a declaration of a suspected outbreak by the Minister of Health and Social Services, or relevant ministry. Once the outbreak is confirmed, the Minister of Health and Social Services will then declare the outbreak.

6.2 Mobilize 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 the membership of the team reflects the technical needs of the response.

Section 5 of these guidelines for recommendations on the composition of the PHERRT and the team's roles and responsibilities.

6.2.1 Convene the District Public Health Emergency Management Committee (PHEMC)

Once an outbreak or event is confirmed, the chairperson of the District Coordinating Committee (DCC) will convene the PHEMC to assess and implement the response. They will also activate the IMS.

See Section 5.

The following further steps should take place:

1. Request outbreak or event response funds to be released.

2. Alert neighbouring districts within and outside the country about the outbreak. If they are reporting a similar outbreak, coordinate response efforts with them. If there is an already established cross-border surveillance and response framework with neighbouring countries, inform the neighbouring districts that border the country. If not, the IHR NFP must communicate with the neighbouring NFP to notify them of the public health event. This will assist in coordination of the response to a public health event, and minimize spread of the disease beyond the catchment area.

3. Assign clear responsibilities for specific response activities to lead the technical committees. They will also review whether the IMS team is adequately composed i.e. has all the technical and non-technical members.

   See Section 5.

4. Provide orientation or training, along with adequate supplies of relevant equipment for the district response team and affected health facility staff.

5. Review existing resources as defined in the preparedness and response plan, and determine what additional resources are required.

For example, consider:

- Human resources that could be mobilized to manage the epidemic;
- Funds to support response activities; and
- Other logistic support e.g. vehicles and fuel, phones, etc.

6. Request emergency stocks such as PPE, disinfectants, required medicines and other medical supplies such as specimen transport kits.

7. Provide laboratory or diagnostic support for confirmation of pathogens responsible for the epidemics. If the district does not have the capacity to safely collect, package and ship the specimen, contact the central reference laboratory for assistance. For laboratories where referral of specimens is a challenge, consider using Rapid Diagnostic Testing (RDT) kits or any other Point of Care (PoC) Tests, if available.

8. Mobilize logistics support to district and facility levels (travel of rapid response team, accommodation arrangements, communications, and other essential equipment).

9. If supplies are not available locally:

    a. Contact the regional or national level to request alternative suppliers.
    b. Collaborate with other stakeholders, e.g., NGOs, local authorities, private health facilities, private pharmacies/ laboratories in the area.
    c. Identify practical cost-effective substitutes.

10. Ensure clear lines of communication and appoint a spokesperson.

6.3 Select and implement appropriate public health response activities

Review the investigation results and data analysis interpretation provided by PHERRT, to select the appropriate response activities to contain the confirmed outbreak, or public health event. Regardless of the specific causes of the outbreak or event, the success of the response relies on the activation of the IMS, and at the same time implementing intervention strategies such as:

- Overall coordination,
- Case management and IPC,
- Logistics and supply chain management,
- Laboratory or diagnostic services, surveillance and epidemiological investigations,
- Risk communication and community engagement,
- Reactive vaccination,
- Water, Sanitation and Hygiene (WASH)
- Vector control, and
- Other relevant strategies.

See Section 11 for information on the national disease-specific guidelines to select response activities.

Response activities should include:

- Proven measures to prevent unnecessary deaths or disabilities due to the specific cause of the public health emergency/ event.
- Different activities for the immediate control of the public health emergency/ event in the short-term, and reducing the risk of ongoing transmission in the long-term through prevention activities.
- Participation from the community, healthcare facilities and district personnel.
- Participation of other key stakeholders from private organizations, business entity association groups, local authorities, private health facilities, traditional healers, herbalists, traditional leaders, faith-based organizations, food vendor associations, and others who might influence the response activities.

Response activities for particular outbreaks, public health emergencies or events may include the following:

- Case management
- Conduct emergency vaccination campaigns, when recommended for humans or animals
- Provide relevant chemoprophylaxis and vaccination for health workers
- Improve access to WASH
- Improve safe disposal of human and animal waste
- Improve food handling practices
- Reduce exposure to mosquitoes and other vectors
- Control of vectors
- Involve other experts (socio-anthropologist, social scientist)
- Enhance specific surveillance measures at PoE
- Enhance social mobilization and behavioural change activities
- Strengthen media and public communication (press, radio, TV, social media, etc.)

Implementing a response means carrying out the operational steps to ensure that the response actions take place as planned. Regardless of the specific causes of the outbreak or event, the success of the response relies on the success of general factors such as management (treatment and monitoring of patients for adverse events, particularly if experimental medicines or vaccines are used), and appropriate IPC, provision of supplies, and the availability of trained health staff.

Selected activities for responding to outbreaks or public health events include the following:

- Strengthen case management and infection prevention and control measures
- Build capacity for response staff
- Enhance surveillance during the response
- Enhance surveillance in neighbouring border districts
- Engage community during response
- Inform and educate the community
- Conduct a mass vaccination campaign
- Improve access to clean and safe water
- Ensure proper sanitation
- Ensure safe disposal of infectious waste
- Improve food handling practices
- Reduce exposure to infectious or environmental hazards
- Ensure appropriate, adequate logistics and supplies
- Ensure safe and dignified burial and handling of dead bodies.

6.3.1 Strengthen case management and Infection Prevention and Control measures (IPC)

Take steps to support improved clinical practices in the district.

See Annex 6A at the end of this section, and Section 11 for information on treating cases of different diseases during an outbreak.

- Train and equip healthcare workers at the district level to undertake the following measures:
- Ensure IPC measures have been implemented during specimen collection by health workers.
- Ensure that clinicians receive results of laboratory confirmation where necessary.

- Ensure healthcare workers record all patients in a recognizable standardized register and a line list.
- In an epidemic involving a large number of cases, ask the officer-in-charge at each health facility to identify an area that can be used to accommodate a large number of patients.
- Provide SOPs that include IPC guidelines.
- Implement IPC and risk mitigation measures, for example:
- Ensure availability of IPC SOPs at facility level.
- Ensure provision of IPC training to all health workers.
- Establish triage and isolation wards for highly infectious diseases (Crimean Congo Haemorrhagic Fever (CCHF), Ebola, Cholera, SARS, etc.). See Annex 6H at the end of this section, for Cholera treatment centre.
- Ensure health workers have access to PPE for any infectious diseases (especially for CCHF and SARS).
- Ensure that there are safe practices and protection for non-healthcare workers (supporting staff, e.g. security, porters, cleaners, administrative staff).
- Assess and assure IPC and WASH standards for health facilities and address any identified gaps.
- Ensure appropriate and safe waste management, including waste segregation, and disposal of PPE and other contaminated supplies.
- Ensure appropriate biosafety and biosecurity for animals (farms, markets, etc.).
- Ensure the necessary medicines and treatment supplies are available.
- Ensure that the proper treatment protocols and case management algorithms are available.
- Review the SOPs for the referral system
- Ensure that a proper discharge protocol for cases linked to social workers, and home-based services is available.

6.3.2 Build the capacity for 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 involved in the response are aware of, and have access to, any indicated PPE and IPC practices determined by the disease. If there are mandatory immunization requirements for responding to a particular disease or condition, ensure that members of the PHERRT are vaccinated.

To reinforce the skills of response staff:

1. Give clear and concise directions to health workers and other staff taking part in the response.
2. Select topics for orientation or training. Emphasize case management and IPC measures for the disease-specific recommendations.

Select other training topics depending on the risk of exposure to the specific public health hazard for example:

- Case management protocols for cases;
- Enhancing standard precautions (use of clean water, hand-washing and safe disposal of sharps);
- Barrier nursing and use of PPE based on the risk assessment;
- Application of transmission-based precautions;
- Treatment protocols such as delivering Oral Rehydration Solution (ORS) and using intravenous fluids;
- Environmental cleaning and disinfection;
- Decontamination, disinfection and sterilization of equipment;
- Safe disposal of human remains and dignified burials;
- Appropriate waste management practises;

- Safe disposal of animal carcasses; and
- Others which may seem necessary, including client-patient interactions and counselling skills, and orientation on how health workers would interact with CBS focal persons etc.

3. Conduct orientation and training

- Orient or re-orient the district PHEMC, PHRRT, and other health and non-health personnel on epidemic management, based on the current epidemic.
- In an urgent situation, there is often no time for formal training. Provide on-the-job training as needed. Make sure there is an opportunity for the training physicians or nursing staff to observe the trainees, using the updated or new skill.
- Monitor participant performance and review skills as needed.

6.3.3 Enhance surveillance during the response

During a response to an outbreak, healthcare workers at all health facilities must be vigilant in surveillance of the disease, condition or events, by liaising with the CHWs, or any person identified as a community focal person.

For example, members of the response teams, and health workers in affected facilities should:

- Search for additional persons who have the specific disease and refer them to the health facility or treatment centres, or if necessary, quarantine the household while managing the patient, and ensure that they have access to consistent basic needs such as food, water, and non-food items.
- Ensure timely provision of laboratory information to the team.
- Update the line list, make data analysis by time (epi curve), person (age and sex), and place (mapping of cases).
- Ensure timely provision of laboratory information.
- Monitor the effectiveness of the outbreak response activities.
- Report daily at the beginning of the epidemic.
- Once the epidemic progresses, the national PHEMC can decide on a different frequency of reporting.
- Actively trace and follow up contacts as indicated.

See Section 4 for information on how to do contact tracing.

6.3.4 Enhance surveillance with neighbouring border districts

During a response, it is important to work closely with neighbouring districts to ensure the outbreak does not spill over to another district. It is also crucial to share information, and to plan for joint surveillance and response activities.

- Initiate the establishment of 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 draw membership from both neighbouring districts and should include at least:

- The district surveillance focal person
- The focal person responsible for laboratory services
- The district senior medical officer
- The district environmental health practitioner
- The nurse manager

- The primary healthcare supervisor
- The focal person responsible for animal (domestic and/or wildlife) health
- Immigration officer where applicable
- The local police station commander.

The committee can also co-opt other members depending on the disease profile and the disease outbreak/public health emergency they are handling.

When a public health emergency is suspected, the committee will meet immediately and then regularly, as determined by the prevailing situation. The committee will continue to hold routine quarterly meetings during the inter-epidemic period to review disease trends, other early warning systems, and the level of preparedness of their district.

6.3.5 Engage community during response

Community-based Surveillance Focal Persons (CBS FP) can be the first responders, and take steps to make the situation as safe as possible for the community.
See Introduction Section.

Some of the actions CBS FP can take, include the following:

- Engage community leaders and provide information on the situation, and advise on actions that can be taken to mitigate the situation.
- Provide first aid and refer for medical help.
- Keep people away from a risk area (e.g., potentially contaminated water sources).
- Isolate anyone with a potentially infectious disease in a dignified manner, paying particular attention to cultural differences.
- Quarantine animals and close markets, etc.
- Provide community education, including specific actions the community can take to protect themselves.
- Engage in IPC and hygiene promotion, in coordination with any efforts at strengthening the availability of materials/infrastructure for IPC and hygiene.
- Identify effective local channels for delivery of information to the community;
- Organize door-to-door campaigns utilizing CHWs, community volunteers and trusted individuals to reach every household within the catchment area, to promote the prevention of the spread of the public health event, and to encourage self-reporting, treatment and health-seeking behaviour among people who have had contact with the public health event, or are suspected to be public health event cases.
- Engage community members as stakeholders and problem solvers, not merely beneficiaries.

6.3.6 Inform and educate the community

Effective Risk Communication and Community Engagement (RCCE) is an essential element of managing public health events. It is a cross cutting 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 may therefore 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 on recognizing the illness, preventing 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, local NGOs or outreach teams that can help gather information and amplify the messages. Ensure consistency in the content of messaging between all messengers (community leaders, health care personnel, religious leaders, etc.).

The following should be considered for effective risk communication:

1. Decide what to communicate by referring to the disease-specific recommendations in Part II: Section 11, and making sure to include:

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

Continue to collect qualitative information to establish what rumours are circulating, so that they can be addressed.

2. Decide how to state the message.

Make sure that the messages:

- Use local terminology;
- Are culturally sensitive and acceptable;
- Are clear and concise;
- Is understandable to a layman;
- Consider local traditions; and
- Address beliefs about the disease.

NOTE: Consider pre-testing the messages from similar settings before dissemination.

See Annex 6F at the end of this section, for sample community education messages.

3. Select appropriate communication methods that are effective in the district. For example:

    - Mass media, (radio, television, newspapers).
    - Meetings (health personnel, community, religious, key opinion leaders and political leaders).
    - Information Education and Communication materials (IECs) (posters, fliers).
    - Multi-media presentations (for example, films, video or narrated slide presentations) at the markets, health centres, schools, women's and other community groups, service organizations, religious centres, etc.
    - Social media (Facebook, Twitter, WhatsApp, etc.).
    - Community drama groups/play groups.

- Public address system.
- Institutional website.
- Email/ SMS subscriptions.

4. Provide community groups, service organizations, community leaders, and local authorities with health education materials, and ask them to disseminate them during their meetings.

5. A designated person from MoHSS will serve as the official spokesperson to the media.

    - Provide contact details of the spokesperson who will be in communication with the media.

    - Release information to the media only through the spokesperson, to make sure that the community receives clear and consistent information.

6. On a regular basis, district and regional managers will meet with local leaders to give:

    - Frequent, up-to-date information on the outbreak and response;
    - Clear and simple health messages for the media; and
    - Clear instructions to communicate information and health education messages from the PHEMC to the media.

6.3.7 Conduct a mass vaccination campaign

Collaborate with the national Expanded Programme on Immunization (EPI) program managers and health program officers responsible for family health, 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 it takes time to procure and distribute vaccines effectively.

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

See Annex 6C at the end of this section, for the worksheet: "Planning a mass vaccination campaign."

See Annex 6D at the end of this section, for the worksheet: "Estimating vaccine supplies for vaccination activities."

See Annex 6E at the end of this section, which describes recommended vaccination practices during vaccination campaigns.

6.3.8 Improve access to clean and safe water

Water storage containers used for 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 shown in the table on page 248. Water needs are much higher during an outbreak situation, especially outbreaks of diarrhoeal diseases.

Table 6.1: Water basic quantity needs calculations

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

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

Safe sources of drinking water include:

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

If no local safe water sources are available during an emergency, water supply may need to be brought from outside the area.

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

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

See Annex 6F at the end of this section, for sample community messages and references, with specific prevention guidelines for preparing safe water at home.

- Containers that prevent contamination of water. For example, provide containers with narrow mouths so that people cannot contaminate the water by putting their hands into the container.
- Sites for waste disposal including faeces should at least be 30 metres or more away from sources of water.

6.3.9 Ensure safe disposal of infectious waste

To make sure that human excreta is disposed of safely, and to avoid secondary infections due to contact with contaminated substances:

- Assign teams to inspect local areas for human and animal waste disposal. Safe practices include disposing of human excreta in a latrine, or burying it in the ground more than 10 metres from the water supply.
- If unsafe practices such as open defecation are found, provide information to the community about safe disposal of the waste. Construct latrines appropriate for local conditions, with the cooperation of the community.
- Conduct effective community education on sanitation practices.

6.3.10 Improve food handling practices

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

To ensure food safety and hygiene:

- Conduct community education on food hygiene practices for the general public and those in the food industry.
- Visit restaurants, food vendors, and food packaging factories etc., to inspect food handling practices. Inspect for safe practices, such as proper hand-washing facilities, cleanliness and adherence to national standards.
- Close restaurants, vending areas or factories if inspection results show unsafe food handling practices.
- Strengthen national controls for food safety and hygiene 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 technical expertise 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 behavioural change interventions can be supportive, in engaging the community to affect changes that will limit exposure to dangerous levels of chemicals and other hazards.

For vector-borne diseases, engage the service of experts, such as an entomologist, to design appropriate interventions that will reduce exposure to the offending vectors (e.g., anopheles mosquito-borne illness).

Work with the malaria control program in your district to:

- Promote indoor residual spraying programme;
- Conduct community education on the proper use of bed nets, and how to avoid dusk-to-dawn mosquito bites;
- Promote the use of locally available Insecticide Treated Nets (ITN) and other insecticide treated materials (bed nets, blankets, clothes, sheets, curtains, etc.); and
- Encourage environmental cleanliness e.g. removing stagnant water, clearing the surrounding environment.

For the prevention of diseases carried by rodents, encourage people in the district to reduce their exposure to these animals. Rodents can transmit the virus that causes Lassa Fever, or they may be infested with fleas that carry Plague.

Together with the Environmental Health Officer in the district, encourage the community to:

- Avoid contact with rodents and their urine, droppings and other secretions.
- Keep food and water in the home covered, to prevent contamination by rodents.
- Keep the home and cooking area clean and tidy to reduce the possibility of rodents nesting in the room.
- Use chemicals (insecticides, rodenticides, larvicides etc.) and traps, as appropriate, based on environmental and entomological assessment.
- Educate the community on personal protection, to reduce exposure to rodents.

6.3.12 Ensure the safe and dignified burial, and handling of dead bodies

Human remains management plays a critical role in combating the spread of infectious diseases, as part of case detection and surveillance, as well as managing potentially infectious material. CCHF, VHF, Cholera, COVID-19, and other unexplained deaths in suspicious circumstances, are situations that require the careful handling of human remains. It is also essential to dispose of human remains in a safe and dignified manner by trained personnel, due to the infectiousness of an epidemic-prone disease. The disinfection or decontamination of homes, hospital wards, and mortuaries should be implemented, especially in the case of persons who died of an infectious disease.

Guidelines should be prepared to ensure proper disinfection or decontamination of homes and hospitals, where there are corpses of suspected infectious disease. Burial teams should be provided with training on safe burial practices, based on these guidelines.

Human remains management guidelines currently distinguish between high and low priority/risk bodies, utilizing a team that have received IPC training. Human remains that are considered high risk, may be treated as a form of surveillance and case detection for CCHF, VHF or other possible conditions, where relevant testing capabilities are available.

Safe burials can be conducted in the community at approved burial sites, in consultation with MoHSS, local authorities, and other relevant stakeholders. The PHEMC may direct to the development of a safe and dignified burial contingency plan, when an infectious disease outbreak occurs, and such a plan will be reviewed periodically to address the evolution of the epidemic.

6.3.13 Ensure appropriate and adequate logistics and supplies

A dedicated logistics 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 way possible. Monitor the reliability of communication between teams during the outbreak, and if additional equipment is needed (e.g., additional airtime for mobile phones), take action to provide teams with the necessary equipment to carry out the response actions.

Monitoring the implementation of the outbreak or event is key for outbreak control. The monitoring results are important for inclusion in the response report to supervisory levels, to community leaders and for future advocacy.

For example, make sure there is ongoing monitoring of:

- Disease trends, in order to assess the effectiveness of the response measures, the extension of the epidemic and any risk factors;
- Effectiveness of the response: case fatality rate, incidence;
- Implementation of the response: programme coverage, meetings of the PHEMC etc.;
- Availability, allocation and use of adequate resources, supplies and equipment;
- Community acceptability of response efforts; and
- Regular reporting on stock of supplies 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 at the end of this section.

Provide information developed by the PHEMC to the affected communities and health facilities.

In the situation updates, provide information such as:

- Details on the response activities. Include dates, places, and category of staff involved in each activity. Also include the epi curve, spot map, and table of person analyses.
- Any changes that were made since the last report.
- Effectiveness of the response: case fatality rate, incidence.
- Implementation of the response: activities etc..
- Achievements, challenges and gaps.
- Recommended changes to improve epidemic response in the future, such as a vaccination strategy to make the vaccination activity more effective, or a transporting procedure for laboratory specimens, to allow specimens to quickly reach the reference laboratory in good condition.

The situation reports will be an important reference for evaluating the response, and developing a final report.

See Annex 7A at the end of Section 7, which contains a suggested format for the report.

See Section 8 which contains detailed steps for monitoring and evaluating a response.

6.5 Document the response

During and after the outbreak the district health management team should:

- Collect all the documents, including minutes of the meeting, activity, process, epidemic report, evaluation report and other relevant documents.
- Prepare a checklist for all the above documents.
- Document lessons learned, recommendations, and update the district/ response plan, event/disease specific plan and other relevant SOPs and Tools in line with Intra-Action Review (IAR) and After Action Review (AAR).

This will become an essential source of data for evaluating the response.

See Section 8 for information on how to monitor, evaluate, supervise and provide feedback on IDSR activities.

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Annex 6A: Treat 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:

1. Cholera
2. Dysentery
3. Measles
4. Bacterial meningitis.

! NOTE: For detailed treatment guidelines of these and other diseases of priority concern, please refer to the specific disease guidelines

1. Treat cholera in an outbreak situation

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 5 suspected cholera patients.
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	
If two of the following signs are present: • lethargic or unconscious • sunken eyes • not able to drink or drinking poorly • skin pinch goes back very slowly	**SEVERE DEHYDRATION*** Give fluid for severe dehydration. (Plan C)
*In adults and children older than 5 years, other signs for severe dehydration are "absent radial pulse" and "low blood pressure".	
If two of the following signs are present: • restless, irritable • sunken eyes • drinks eagerly, thirsty • skin pinch goes back slowly	**SOME DEHYDRATION** Give fluid according to "for some dehydration." (Plan B)
If there are not enough signs to classify as some or severe dehydration:	**NO DEHYDRATION** Give fluid and food to treat diarrhoea at home. (Plan A)

See Plans C - A on following pages.

Plan C. Intravenous therapy for severe dehydration

- Severe dehydration is a medical emergency and patients must be treated urgently. Seconds can make a difference.
- Patients with severe dehydration should start intravenous fluids (IV) immediately.
- As soon as the patient can drink, also give ORS solution 5ml/kg/hour simultaneously.
- 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:

  - normal saline
  - 5% glucose in normal saline
  - Cholera saline (containing Na+, 133; K+, 20; Cl-, 98; acetate, 48 ml/L)

- Plain 5% glucose (dextrose) solution is not recommended.
- Give a total of 100 ml/kg Ringer's Lactate Solution divided into two periods as indicated 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

- More than one IV line may be necessary to give the first bolus treatment.
- When IV rehydration is not possible and the patient cannot drink, ORS solution can be given by nasogastric tube.
  - Do not use nasogastric tubes for patients who are unconscious or vomiting.
- When possible, fluid output should be measured and equivalent volumes added to the amount described for initial treatment.
- Monitor the patient closely and perform frequent reassessment (every 15-30 min).
- 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.
- 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

- 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.
- Antibiotics should be given only in severe cases, to reduce the duration of symptoms and carriage of the pathogen.
- Antibiotics are given as soon as the patient is able to take oral medication (once vomiting has stopped):
- Doxycycline: single dose (300mg for adults; 2-4 mg/kg for a child between 1 and 14 years of age), is the antibiotic of choice for all patients, including pregnant women.
- If resistant to doxycycline, azithromycin (1g orally as a single dose for adults, and 20 mg/kg (max 1g) orally as a single dose for children < 12 years.

Age	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

- Patients presenting with some signs of dehydration must be admitted to the CTC/CTU.
- Initial treatment, give ORS according the weight of the patient (75ml/kg in the first 4 hours).
- 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:
  - If at any time signs of severe dehydration appear then shift immediately to Treatment Plan C.
  - If there are still some signs of dehydration after the first 4 hours, repeat Treatment Plan B for 4 hours and reassess.
  - 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.
- If the patient vomits while taking fluid, wait 10 minutes, then allow the patient to resume feeding, more slowly.
- Continue monitoring the patient and replace fluid, until the diarrhoea stops.
- When the patient is ready to leave the facility, counsel the patient on treating diarrhoea at home.
- Refer to IMCI guidelines for treating children under 5 years of age, and the national guidelines for further information on treating acute watery diarrhoea and confirmed cholera.

Plan A. Oral rehydration for patients with no signs of dehydration

- Patients with no signs of dehydration should be treated with oral rehydration solution (ORS).
- 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.
- If patient is seen at the health facility:
  - Keep the patient for observation for 2-4 hours to ensure they are tolerating ORS.
  - During observation and before sending the patient 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).
- 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 daily).
- 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.
- Patients should receive ORS after each loose stool to maintain hydration until diarrhoea stops.
- 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

- Consider discharging patient, if:
  - 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.
  - Prior to discharge, provide patients and their caretakers with ORS and instructions on how to prepare it. Moreover, advise when to return to hospital/CTC.

- Inform patient, family members and caretakers 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 (assist a child, where necessary), and before preparing and eating food. If caring for a patient, always wash hands after providing care, and after handling 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 with the appropriate chlorine solution (0.02%), if there has been contact with diarrhoeal stool. 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 them 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 healthcare immediately.
  - While caring for persons who are ill with cholera, do not serve food or drink to persons who are not household members.
  - Visitors may be allowed if the ill person needs company; visitors should also observe hand hygiene recommendation.
  - Give patients information about home care, danger signs, and when to return to the health facility again.

    - Return for treatment if the patient develops any of the following:
      - increased number of watery stools;
      - eating or drinking poorly;
      - marked thirst;
      - repeated vomiting;
      - fever; and
      - blood in the stool.

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

2. 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	**PEDIATRIC 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	5.0 ml
6 - 9 kg	½	½	½	2	5.0 ml
10 - 14 kg	1	1	1	3	7.5 ml
15 - 19 kg	1	1	1	3	7.5 ml
20-29 kg	2	2	1	6	15 ml
Adult dose					
	TABLET 250 mg 4 tablets	**TABLET** 250 mg 4 tablets	**TABLET** 160 mg TMP +800 mg SMX 2 tablets		

Source: WHO Guidelines for the control of epidemics due to S. dysentariae type 1. WHO Geneva. 1995

3. Give vitamin A to children with measles

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

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

Age	**Vitamin A Capsules**		
	200 000 IU	**100 000 IU**	**50 000 IU**
Up to 6 months		½ capsule	1 capsule
6 months up to 12 months	½ capsule	1 capsule	2 capsule
12 months up to 5 years	1 capsule	2 capsules	4 capsules

4. Give appropriate antibiotic for bacterial meningitis cases during, and outside of an outbreak

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 (See treatment protocols in the table below).
3. Ensure that any child under 2 years of age, or any patient with severe symptoms is admitted to the health centre for in-patient 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

! NOTE: 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.

Sources:
Managing meningitis epidemics in Africa: A quick reference guide for health authorities and health-care workers Revised 2015, WHO/HSE/GAR/ERI/2010.4. Rev.
Meningitis outbreak response in sub-Saharan Africa. WHO guideline, WHO/HSE/PED/CED/14.5
Weekly Epidemiological Record No 51/52, 577-588, 19 December 2014(http://www.who.int/wer)
Standard Operating Procedures for Surveillance of Meningitis, Preparedness and Response to Epidemics in Africa, WHO document. WHO/AFRO/FRH October 2018, Brazzaville

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 solution 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 1/2 tablespoon per 1 litre of water	7 grams or 1/2 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

Product	Chlorine available	How to dilute to 0.5%	How to dilute to 1%	How to dilute to 2%
Sodium hypochlorite – liquid bleach	3.5%	1 part bleach to 6 parts water	1 part bleach to 2.5 parts water	1 part bleach to 0.7 parts water
Sodium hypochlorite – liquid	5%	1 part bleach to 9 parts water	1 part bleach to 4 parts water	1 part bleach to 1.5 parts water
NaDCC (sodium dichloroisocyanurate) – powder	60%	8.5 grams to 1 litre water	17 grams to 1 litre water	34 grams to 1 litre water
NaDCC (1.5g/tablet) – tablets	60%	6 tablets to 1 litre water	11 tablets to 1 litre water	23 tablets to 1 litre water
Chloramine – powder	25%	20 grams to 1 litre water	40 grams to 1 litre water	80 grams to 1 litre water

Using market/ shelf liquid bleach to prepare the desired % of chorine:

$$\frac{\text{\% Chlorine in bleach (market/ shelf) minus 1}}{\text{\% Chlorine desired}} = \text{Parts of water for each part of bleach}$$

Example:

$$\frac{5 \text{ minus } 1}{2} = (2.5) \text{ minus } 1 = 1.5 \text{ parts water for each part of bleach}$$

To make 2% chlorine solution: Add 1 part bleach to 1.5 parts water.

To disinfect clothing:

- Promptly and thoroughly disinfect patient's personal articles and immediate environment, using one of the following disinfectants:
  - chlorinated lime powder
  - 1% chlorine solution
  - 1% to 2% phenol solution.
- Promptly and thoroughly disinfect patient's clothing:
- Wash clothes with soap and water
- Boil or soak in disinfectant solution
- Sun dry
- Wash utensils with boiling water or disinfectant solution.

NOTE: Do not wash contaminated articles in rivers or ponds that might be sources of drinking water, or near wells.

Annex 6C: Planning an emergency immunization activity

1. **Review the need to plan vaccination campaigns with health workers, and specify the target population for the immunization activity.**

2. **Estimate the necessary amounts of vaccine, diluent, and immunization supplies such as Auto Disable (AD) syringes, cold boxes, vaccine carriers and safety boxes.**

    a. Coordinate with national EPI program, CMS, WHO country office, and UNICEF offices to arrange for provision of necessary vaccines and supplies if applicable .
    b. A list of pre-qualified WHO vaccines is available at: http://www.who.int/immunization_standards/vaccine_quality/PQ_vaccine_list_en/en/.
    c. If a country has already an Interagency Coordination Committee (ICC), discuss the type of vaccine to be given, the target population and the strategy to be used.
    d. Contact the national level to order vaccines. If a national reserve stock is not available, the CMS will procure vaccines, or request an emergency supply from WHO where applicable.d. Coordinate with the Primary Health Care Supervisor in the district to identify sites for conducting the immunization activity.

3. **Conduct comprehensive micro planning for the campaign. A micro plan is the operational plan for a campaign at district level, coordinated by the PHC supervisor. Ensure that the plan has at least the following:**

    a. Estimate of the number of vaccination teams required and their composition, including roles and responsibility of team members, as well as number of supervisors and monitors.
    b. Identify the facilities that can participate in the activity.
    c. Determine if there are any hard-to-reach areas, e.g., a migrant workers' camp, or pastoral communities. Identify a mobile immunization team to reach these areas.

4. **Make sure that there is enough capacity to store extra amounts of the vaccines, during storage and transportation to the immunization site.**

5. **Include the following:**

    a. List of supervisors and their contact numbers.
    b. Travel plan for teams and supervisors, including transportation requirements.
    c. Map the coordination with other partners and regions/districts, as well as local partners e.g., NGOs, faith-based and civic organizations 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 mobilization plan with community leaders mapped and engaged.
    i. Training schedule.
    j. Budgetary estimates for the various campaign components, including training and planning prior to implementation, and waste disposal following implementation.

6. **Select immunization teams. For every 100 to 150 people expected at the immunization site, the followed staff is required:**

    a. One to two vaccinators to give immunizations;
    b. One recorder to record on immunization cards; and
    c. CHWs, or an identified community volunteer to verify age and immunization status.

7. **Work with your EPI team to conduct refresher training for vaccinators on recommended immunization practices. Ensure instructions are given for the use of safe injection techniques.**

8. **Mobilize the community. Inform the public about the emergency immunization campaign while ensuring that:**

    a. There is a clear communication plan that includes easy to understand information about
    b. the need for the campaign;
    c. There is a clearly defined target population which is to be targeted for the campaign;
    d. There is a clear understanding of the dates of the campaign;
    e. The communication plan has mechanisms for rapidly identifying and addressing rumours, that may arise during the campaign;
    f. There is a single point of contact well versed in risk communications and the local culture; and
    g. There is a clear plan for monitoring any adverse events.

9. **Arrange staff transportation to the immunization sites.**

    a Plan for transportation to and from the sites.
    b. Estimate allowances and DSA and make the necessary arrangements for lodging, if the site is away from the health worker's duty station.

10. **Monitor the overall campaign process and the number of doses of vaccine given.**

    a. Collect daily summary sheets from teams;
    b. Calculate the amount of remaining stocks and supplies necessary for the next day;
    c. Estimated number of individuals vaccinated should be tracked against target population;
    d. Follow up visit plans for missed individuals based on tally/summary sheet information, should be made;
    e. Document any missing houses/individuals to follow-up on subsequent days;
    f. Review the workload at sites and if necessary re allocate/deploy the teams to other sites;
    g. Conduct brief feedback sessions at the end of each day with vaccination teams, and make necessary mid-campaign corrections; and
    h. Give instructions for the use of safe injection techniques. Review the need to plan vaccination campaigns with healthcare workers.

! NOTE: A rapid guide to common Supplementary Immunization Activity (SIA) problems and potential quick fixes is available at:
http://www.polioeradication.org/Portals/0/Document/Resources/PolioEradicators/ 1c.QuickFixesforSIA20100914.pdf

Annex 6D: Estimating vaccine supplies for immunization activities

Outbreak:_____Dateconfirmed:_____/_____/_____

Target population:

- children age 0 up to 5 years
- children age 9 months up to 14 years
- children and adults age 0 up to 30 years
- women of childbearing age 15 years up to 49 years
- all adults and children in the general population

1. **Calculate the size of the target population. If the activity only targets a proportion of the general population, estimate the size of the target population. Multiply the general population, times the percentage of children or adults in the target population. If you do not know the exact age distribution rates in your area, use recommended estimates such as the following:**

- children age 0 up to 5 years (14%)
- children age 9 months up to 14 years (39%)
- children and adults age 1 up to 30 years (70%)
- women of childbearing age 15-45 years (20%)

2. **Find out how many doses each person should receive. Record the number below as "number of doses recommended."**

3. **Allow for wastage. Use a wastage factor of 20%. Multiply the size of the target population (see step 1) times the number of doses times 1.20, as follows:**

_____	X	_____	X 1.20	=	_____	
Size of target population		Number of recommended doses	wastage		Number of doses to order including wastage	

! NOTE: The wastage factor of 20% should only be used at the national level to estimate vaccine requirements during an outbreak. At the district level a 15% wastage factor is used, and at health facility level, 10%.

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, as follows:**

_____	X	1.25	=	_____
Number of doses		Contingency factor		Total number of estimated doses including wastage

! NOTE: It is recommended that the contingency stock is only stored at the national level. However, if a regional level has adequate capacity for the storage of vaccines, then this level 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 that are contained in the vial. (This is usually printed on the label and may be one dose, two doses, five doses, ten doses or twenty doses).**

_____	÷	_____	=	_____
Total number of estimated doses		Doses per viall		Total number of vialls required

7. **Estimate the number of AD syringes that will be needed to carry out the activity. Order the same amount as for the estimated number of doses in Step 4.**

8. **Estimate the number of safety boxes required.**

Annex 6E: Recommended immunization practices

Together with the EPI team, arrange for refresher training for the vaccinators that will conduct the emergency immunization activity. As a minimum, make sure vaccinators know how to:

1. **Reconstitute the vaccine correctly:**

    - Reconstitute the freeze-dried vaccine with the manufacturers recommended diluent.
    - Use an AD syringe to administer each dose.
    - Using the dilution syringe, draw up and expel the air to mix the reconstituted vaccine well.

2. **Always keep the open vial in a vaccine carrier. This will protect the vial from sunlight.**

3. **In a field situation, protect the vaccine from any contamination.**

4. **Place reconstituted vaccine vials and opened liquid vaccine vials on an ice pack. Keep the icepacks and vaccines in the shade.**

5. **Follow multi-dose 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 a requirement for persons to have a vaccination card.**

7. **Collect data for monitoring the activity. For example, record the given number of doses 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 the correct 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 burned or buried in a pit, according to the infection control guidelines.**

Annex 6F: Sample messages for community education

Improve handwashing

Handwashing with soap may be the most effective way to prevent transmission of some organisms causing infectious diseases. For thisreason, promote handwashing in every family. Handwashing is particularly important after defecation, after cleaning a child who has defecated, after disposing of a child's stool, before preparing or handling food, and before and after eating.

Handwashing is practiced more frequently where water is plentiful, and within easy reach. If possible, water for washing should be stored separately from drinking water. During an epidemic, soap should be provided to those who do not have access to it. If soap is not available, alcohol hand rub can be used to scrub the hands. Do not dry washed hands with dirty cloths. Air-dry wet hands.

Example Message:

ARE YOU PROTECTED FROM DYSENTERY (bloody diarrhoea)?

Washing your hands protects you and others from the disease.

Always wash your hands:

- **after defecation;**
- **after cleaning a child who has defecated;**
- **after disposing of a child's stool or changing baby nappies;**
- **before and after eating; and**
- **before preparing or handling food.**

Example Message:

ARE YOU READY FOR HAND-WASHING?

You should have:

- **Clean water and soap (or use alcohol hand rub to sanitize your hands).**
- **Clean cloth for drying or allow a few minutes to air dry hands.**

Safe handling of food

Encourage the following food safety practices

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

Example Message:

DO YOU PREPARE FOOD SAFELY?

Cooking kills germs.

- **Thoroughly cook all meats, fish and vegetables.**
- **Eat cooked meats, fish and vegetables while they are hot.**
- **Washing protects from disease.**
- **Wash your hands before preparing or serving food.**
- **Wash your dishes and utensils with soap and water.**
- **Wash your cutting board especially well with soap.**
- **Peeling protects from disease**
- **Only eat fruits that have been freshly peeled (such as bananas and oranges).**

KEEP IT CLEAN: COOK IT, PEEL IT, OR LEAVE IT.

FIVE KEYS TO SAFER FOOD:

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

Five keys to safer food

Keep clean

- Wash your hands before handling food and often during food preparation
- Wash your hands after going to the toilet
- Wash and sanitize all surfaces and equipment used for food preparation
- Wash and sanitize all surfaces and equipment used for food preparation
- Protect kitchen areas and food from insects, pests and other animals

Why?

While most microorganisms do not cause disease, dangerous microorganisms are widely found in soil, water, animals and people. These microorganisms are carried on hands, wiping cloths and utensils, especially cutting boards and the slightest contact can transfer them to food and cause foodborne diseases.

Separate raw and cooked

- Separate raw meat, poultry and seafood from other foods
- Use separate equipment and utensils such as knives and cutting boards for handling raw foods
- Store food in containers to avoid contact between raw and prepared foods

Why?

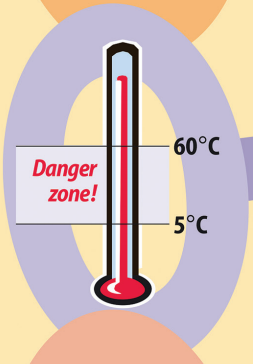
Raw food, especially meat, poultry and seafood, and their juices, can contain dangerous microorganisms which may be transferred onto other foods during food preparation and storage.

Cook thoroughly

- Cook food thoroughly, especially meat, poultry, eggs and seafood
- Bring foods like soups and stews to boiling to make sure that they have reached 70°C. For meat and poultry, make sure that juices are clear, not pink. Ideally, use a thermometer
- Reheat cooked food thoroughly

Why?

Proper cooking kills almost all dangerous microorganisms. Studies have shown that cooking food to a temperature of 70°C can help ensure it is safe for consumption. Foods that require special attention include minced meats, rolled roasts, large joints of meat and whole poultry.



Keep food at safe temperatures

- Do not leave cooked food at room temperature for more than 2 hours
- Refrigerate promptly all cooked and perishable food (preferably below 5°C)
- Keep cooked food piping hot (more than 60°C) prior to serving
- Do not store food too long even in the refrigerator
- Do not thaw frozen food at room temperature

Why?

Microorganisms can multiply very quickly if food is stored at room temperature. By holding at temperatures below 5°C or above 60°C, the growth of microorganisms is slowed down or stopped. Some dangerous microorganisms still grow below 5°C.

Use safe water and raw materials

- Use safe water or treat it to make it safe
- Select fresh and wholesome foods
- Choose foods processed for safety, such as pasteurized milk
- Wash fruits and vegetables, especially if eaten raw
- Do not use food beyond its expiry date

Why?

Raw materials, including water and ice, may be contaminated with dangerous microorganisms and chemicals. Toxic chemicals may be formed in damaged and mouldy foods. Care in selection of raw materials and simple measures such as washing and peeling may reduce the risk.

Design: Marilyn Langfeld; Illustration: Janet Pettpierre

Food Safety
World Health Organization

Knowledge = Prevention

WHO/SDE/PHE/FOS/01.1
Distribution: General
Original: English

Safe disposal of human waste

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

Community messages should emphasize:

- Everyone should use latrines properly, including children.
- Transfer children's excreta with a scoop or shovel to the latrine, or bury in a hole.
- Avoid defecating on the ground, or in, or near the water supply.

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

Example Message:

ARE YOU PROTECTED FROM DYSENTERY (bloody diarrhoea)?
DO YOU USE A TOILET OR LATRINE?

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

- **Always use a toilet or latrine. It you don't have one – build one!**
- **Keep the toilet or latrine clean.**
- **Wash your hands with soap (or ash) and clean water, after using the toilet or latrine.**

KEEP IT CLEAN: USE A TOILET OR LATRINE

Clean drinking water and storage

- **Community drinking water supply and storage**

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

- **Home drinking water storage and treatment**

When the safety of the drinking water is uncertain, it should be chlorinated in the home or boiled.
To prevent contamination of drinking water, families should store drinking water using one of the following types of containers:

1. **Covered containers** that are cleaned daily, and kept away from children and animals. Water should be removed from the containers using a long-handled dipper, kept especially for this purpose.
2. **Narrow-mouthed containers** with an opening too small to allow the insertion of a hand. Water should be removed by pouring from the opening or spout.
3. Water used for bathing, washing and other purposes other than drinking need not be treated, and should be stored separately from drinking water.

Safe disposal of human remains

The body fluids of persons who die due to Cholera, Viral Haemorrhagic Fever, COVID-19, or any other highly contagious disease, are still infectious. Use extreme caution when preparing the bodies of these suspected or confirmed patients. Encourage safe funeral and burial practices.

Reducing exposure to mosquitoes

Mosquito control is the main intervention for reducing Malaria transmission. It can reduce Malaria transmission from very high levels to close to zero. In high transmission areas, mosquito control can significantly reduce child and maternal deaths. Personal protection against mosquito bites represents the first line of defence for Malaria prevention.

Example Message:

ARE YOU PROTECTED FROM MOSQUITO BITES?

Whenever possible:

- **Avoid going out between dusk and dawn, when mosquitoes commonly bite.**
- **Wear long-sleeved clothing and long trousers when going out at night, and avoid dark colours, which attract mosquitoes.**
- **Apply insect repellent to exposed skin (if the repellent is available).**
- **Use screens over doors and windows.**
- **Use an insecticide-treated mosquito net over the bed.**
- **Use anti-mosquito sprays or insecticide dispenser (if available).**
- **Avoid stagnant water bodies.**

Malaria transmission can rapidly be reduced by indoor residual spraying (IRS) with insecticides. IRS works for between 3 to 12 months, depending on the insecticide used, and the type of surface on which it is sprayed.

Annex 6G: Outbreak communication

Introduction

Following verification and confirmation of the event, the district level should liaise with the national level through the regional office, to communicate and receive guidance on the relevant information to be delivered to the media.

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

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

In addition, the district Senior Medical Officer should support the communication and provide scientific expertise as evidence for intervention.

Actions at the district level

- Liaise with the regional spokesperson(s) (political and technical);
- Liaise regularly with national authorities to provide them with first-hand information (received at the community local level, the media, and local stakeholders);
- Be in regular contact with national authorities, to receive common messages including guidance and answers for frequently asked questions, to feed the local media;
- Be available for interviews by local media upon request, to provide accurate, transparent and updated information following directions from national level, in simple clear key messages;
- Organize press briefings to provide regular information to local media, following directions from the national level;
- Develop good relationships with local media to partner fin the delivery of accurate, transparent, and timely messages to the population;
- Use information materials developed at the national level with clear consistent messages, to provide guidance to the population;
- Identify local powerful channels for the delivery of information to the population;
- Meet regularly with local stakeholders to disseminate the correct messages of prevention and surveillance to the population; and
- Organize preventative door-to-door campaigns to reach remote rural areas and promote prevention and surveillance, following directions from national level.

Annex 6H: Guide to IPC measures

1. Handwashing

Purpose: To protect the patient, staff and caregivers from cross infection.

Responsibility: Clinicians, environmental health practitioners, caregivers.

Steps for handwashing:

- Hands are washed thoroughly, for a minimum of 40-60 seconds with soap, (plain or antimicrobial) and running water (tap or run to waste method).
- Remove jewelry (rings, bracelets) and watches before washing hands, and ensure that the nails are clipped short (do not wear artificial nails). Roll sleeves up to the elbow.
- Wet the hands and wrists, keeping hands and wrists lower than the elbows (permit the water to flow to the fingertips, avoiding arm contamination).
- Apply soap (plain or antimicrobial or ash) and lather thoroughly.
- Use firm, circular motions to wash the hands and arms up to the wrists, covering all areas including palms, back of the hands, fingers, between fingers, and lateral side of the fifth finger, knuckles, and wrists.
- Rub for a minimum of 10-15 seconds for each step.
- Repeat the process if the hands are very soiled. Clean under the fingernails.
- Rinse hands thoroughly, keeping the hands lower than the forearms. If running water is not available, use a bucket and pitcher.
- Do not dip your hands into a bowl to rinse, as this re-contaminates them. Collect used water in a basin and discard in a sink, drain or toilet.
- Dry hands thoroughly with disposable paper towel or napkins, clean dry towel, or air dry them. Discard the towel if used, in an appropriate container without touching the bin lids with hands. Use a paper towel, clean towel or your elbow/foot to turn off the faucet to prevent re-contamination.

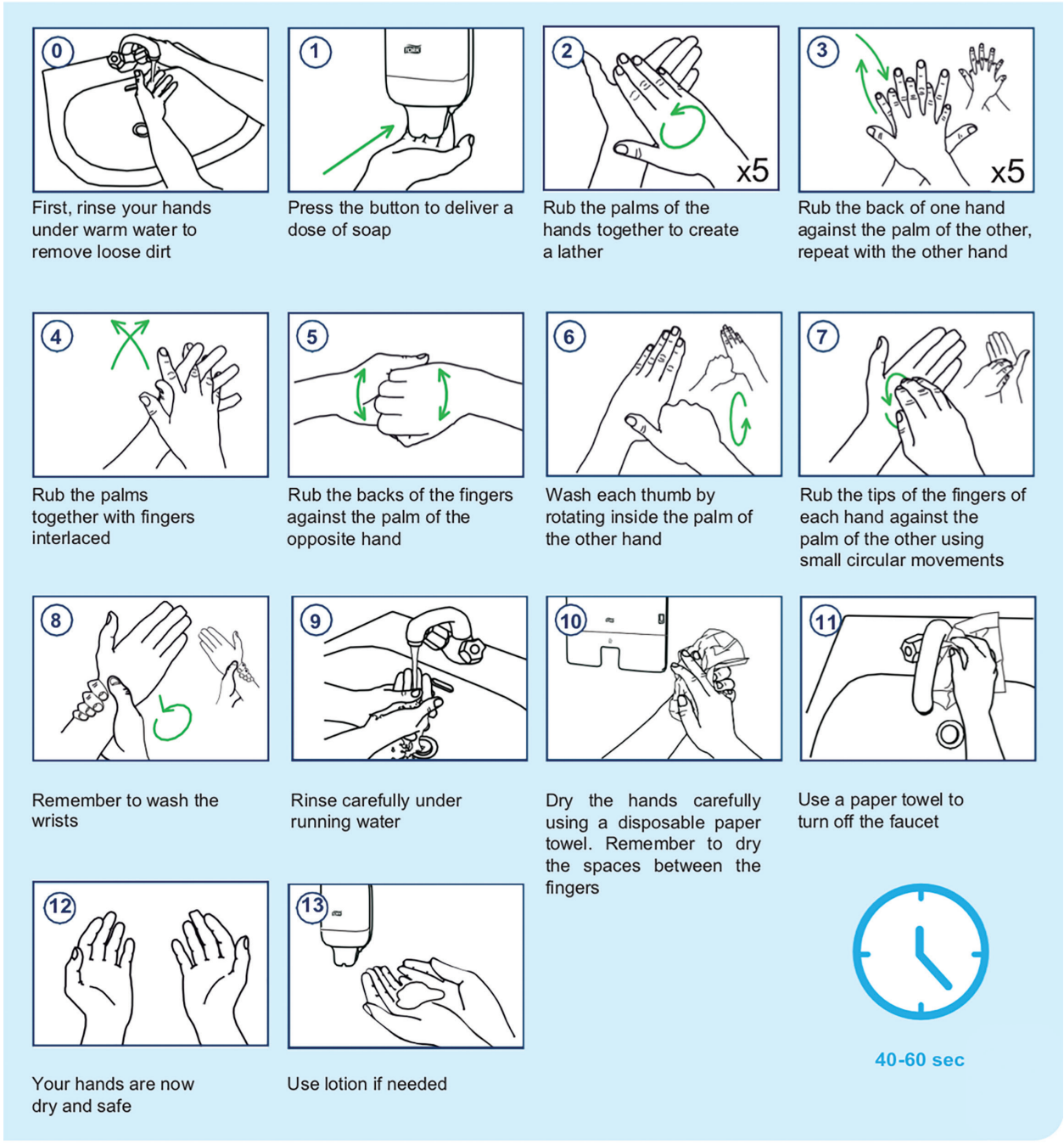
2. Different types of antiseptic disinfection:

Using antiseptics, hand rub gels, or alcohol swabs for hand antisepsis:

- Apply the product to the palm of one hand. The volume needed varies by product.
- Rub hands together, covering all surfaces of hands and fingers, until hands are dry.
- Hand rubbing should last for at least 20 seconds.
- Do not rinse.

! NOTE:

- **When there is visible soiling of hands, they should first be washed with soap and water, before using waterless hand rub gels or alcohol swabs.**
- **In situations where soap is not available, ash can be used for washing hands.**



3. Hand Hygiene Techniques

This is a process which mechanically removes soil and debris from skin, and reduces the number of transient microorganisms. Handwashing with plain soap and clean water is as effective in cleaning hands and removing transient microorganisms as washing with antimicrobial soaps, and causes less skin irritation.

Steps:

- Thoroughly wet hands.
- Apply a handwashing agent (liquid soap); an antiseptic agent is not necessary.
- Vigorously rub all areas of hands and fingers for 10–15 seconds (tip: 10 average breaths), paying close attention to fingernails and between fingers.
- Rinse hands thoroughly with clean running water from a tap or bucket.
- Dry hands with paper towel or a clean, dry towel or air-dry them.
- Use a paper towel or clean, dry towel when turning off water if there is no foot control, or automatic shut off.

! NOTE:

- **If bar soap is used, provide small bars and soap racks that drain.**
- **Use running water and avoid dipping hands into a basin containing standing water; even with the addition of an antiseptic agent, microorganisms can survive and multiply in these solutions.**
- **Do not add soap to a partially empty liquid soap dispenser. This practice of "topping off" dispensers may lead to bacterial contamination of the soap.**
- **When soap dispensers are reused, they should be thoroughly cleaned before filling.**
- **When no running water is available, use a bucket with a tap that can be turned off to lather hands and turned on again for rinsing, or use a bucket and pitcher.**
- **Used water should be collected in a basin and discarded in a latrine if a drain is not available. Guidance to donning and doffing (putting on, and taking off) PPE**

4a. Steps to putting on WHO PPE using coverall

1. Remove all personal items (jewelry, watches, cell phones, pens, etc.)
2. Tie hair to the back if it is in the way, and could get contaminated. Alternatively, put on a laboratory head cap.
3. Put on the scrub suit and rubber boots* in the changing room.
4. Move to the clean area at the entrance of the isolation unit.
5. Gather PPE beforehand. Select the right size coverall.
6. Put on PPE under the guidance and supervision of a colleague.
7. Perform hand hygiene.
8. Put on inner gloves (examination, nitrile).
9. Put on coverall.
10. Place thumb (or middle finger) in the hole in the coverall sleeve or thumb loop.
11. Put on face mask.
12. Put on face protection (either face shield or goggles).
13. Put on head covering: Surgical bonnet or hood.
14. Put on disposable waterproof apron.
15. Put on outer gloves (examination, nitrile) over cuff.
16. Self-check in mirror.
17. Check colleague and write name/ occupation/ time of entry.

4b. Steps to taking off WHO PPE using coverall

1. If you are not trained, always remove PPE under the guidance and supervision of a trained observer (colleague).
2. Enter decontamination area by walking through chlorine tray.
3. Perform hand hygiene on gloved hands (0.5% chlorine).
4. Remove apron, taking care to avoid contaminating hands by peeling it off.
5. Perform hand hygiene on gloved hands (0.5% chlorine).
6. Remove hood or bonnet, taking care to avoid contaminating your face.
7. Perform hand hygiene on gloved hands (0.5% chlorine).
8. Remove coverall and outer pair of gloves.
9. Tilt head back to reach zipper, unzip completely without touching any skin or scrubs, remove coverall from top to bottom.
10. After freeing shoulders, remove the outer gloves while pulling the arms out of the sleeves.
11. Using inner gloves, roll the coverall from the waist down, and from the inside of the coverall down to the top of the boots.
12. Use one boot to pull off coverall from other boot and vice versa, and then step away from the coverall and dispose of it safely.
13. Perform hand hygiene on gloved hands (0.5% chlorine).
14. Remove the goggles or face shield from behind the head (keep eyes closed).
15. Perform hand hygiene on gloved hands (0.5% chlorine).
16. Remove mask from behind the head (keep eyes closed).
17. Perform hand hygiene on gloved hands (0.5% chlorine).
18. Remove inner gloves with appropriate technique, and dispose of safely.
19. Decontaminate boots appropriately and move to lower risk area, one foot at a time, and perform hand hygiene (0.05% chlorine).

5. Setting up a Cholera isolation camp/unit/ or Cholera Treatment Centre (CTC)

a. Site management

There are different recommendations for different situations/circumstances:

i. In urban settings and refugee camps:

Establish CTC + several Oral Rehydration Points (ORPs)

Ideally, the CTC should be located inside the existing hospital premises, but clearly separated and isolated from the other departments, to avoid spread of infection to non-Cholera patients. If the hospital premises are not suitable, another site must be found. In urban/camp settings, it is preferable to have one single CTC and several ORPs, rather than setting up multiple CTCs, thereby increasing potential sources of infection. When affected areas are too far from the CTC, access may be a problem. Ambulances can be provided for referral, or a **Cholera Treatment Unit (CTU)** may be established as an intermediate structure. Use of taxis/buses should be discouraged, given the high contamination risk during the journey.

ii. In rural settings:

Establish Cholera Treatment Units (CTU)

The CTU should be located inside the health facility, or close to it. If this is not possible, other existing structures may be used. CTUs may disrupt routine health services, as adequate case management is labour-intensive, and other health services may suffer from staff shortages. In areas that are far from any treatment facility, it may be possible to decentralize the CTU to the level of the affected villages.

Oral Rehydration Solution Points (ORSPs)

ORSPs have two objectives: to treat patients, and to screen off and refer severely dehydrated patients to CTC/CTU(s). They reduce pressure on overburdened CTCs or CTUs. They can be decentralized to the community level. CHWs should receive quick training and regular supplies, to be able to achieve the given objectives.

b. Design of a CTC

i. Selection criteria

When establishing a CTC, the following should be considered when selecting a site:

- Proximity to the affected area.
- Easy accessibility for patients and supplies.
- Protection from wind (there should be windbreaks)
- Adequate space.
- Compatibility with adjacent existing structures and activities.
- Availability of adequate potable/safe water supply, within a minimum distance to avoid contamination.
- Good drainage from the site.
- Provision of waste management facilities (clinical and general waste).
- Provision of handwashing facilities at entrance(s) of centre, treatment areas for patients, and different points within centre.
- Availability of sanitary facilities (temporary).
- Provision for extension of CTC (basing on estimation given by epidemiologist).
- Designated and separate areas for putting on and removing PPE.

ii. Setting up a temporary Cholera treatment camp

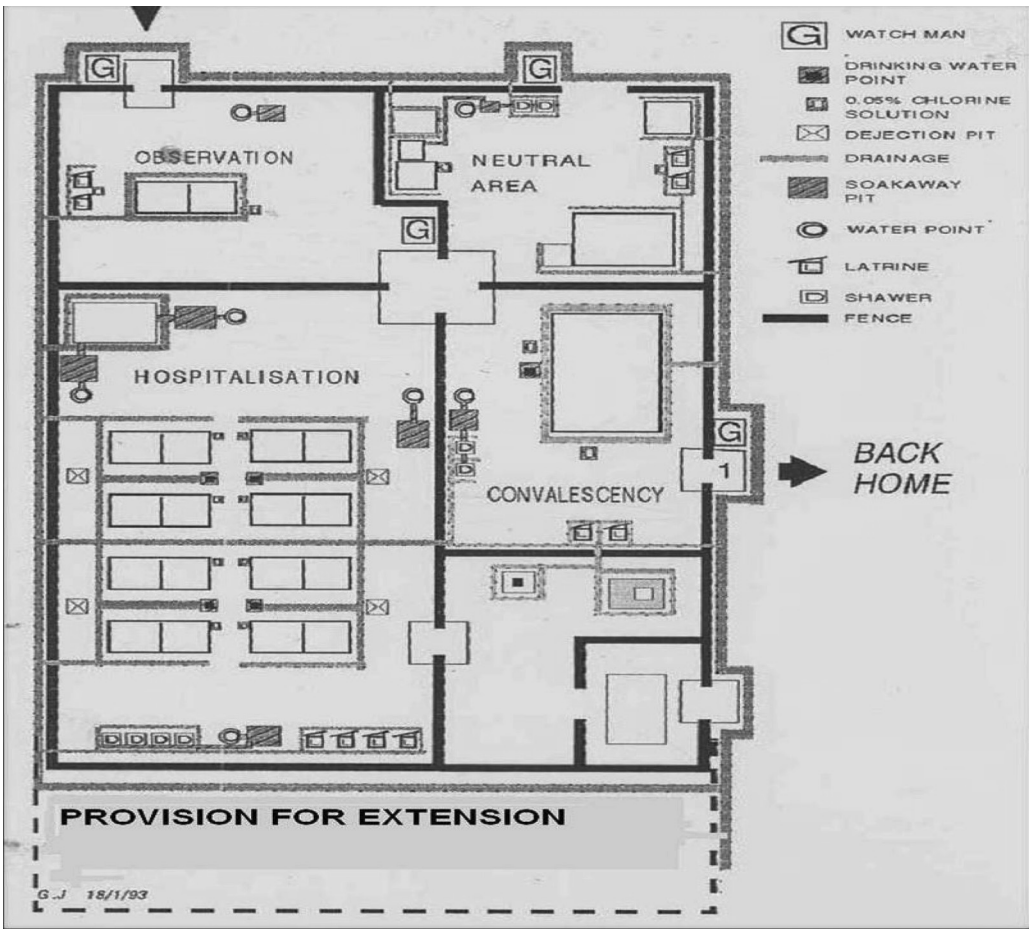
- In setting up a Cholera camp, an existing building can be used, or set up tents.
- It is important to consider the safety of patients and ventilation, as high temperatures contribute to the dehydration of patients.
- The Cholera camp should operate 24 hours a day, independently of the other health facilities, and the necessary staff has to be recruited.
- It should be supplied with the necessary medical equipment and materials, specifically for use in the centre.
- An enclosure or other form of acceptable screen should be provided around the Cholera camp.
- The various workstations should be clearly labelled, and directions provided.
- The CTC must be a "closed system," where contamination is introduced through patients, and must be destroyed inside the structure. Under no circumstances should any contamination escape (either through patients, water, material, solid or liquid waste etc.).

iii. General rules for the good design of a Cholera camp:

- Restrict unnecessary movement for staff and patient.
- Each zone is a "closed box."
- Systematic disinfection between zones.
- Discipline and mutual control of hygiene for the patient, attendant and staff.
- Restriction of visitors to reduce cross infections until the situation is under control.

Good infection control means anything emerging from the centre, is free of contamination.

The diagram below is an example of the layout for a cholera treatment centre.



iv. Triage and observation

- Patients are examined by a medical person for screening. If Cholera is confirmed, admit; otherwise send to normal dispensary.
- Patients are admitted with 1 attendant (caregiver) if necessary.
- Patients who are admitted, are registered in the Cholera line list.
- A foot bath should be provided at the entrance.
- Toilets and water should be easily accessible for patients.
- Shower facilities should be provided for the patients.
- A disinfection area should be provided for the transporting vehicles and contaminated articles of the patients.
- Tables, chairs, water containers fitted with taps, and refuse containers should be provided in these areas.
- Provision of safe water.
- Establish an ORS point.

v. Admissions area

- Patients with severe dehydration and/or uncontrollable vomiting, must be hospitalized for immediate rehydration.
- Each patient lies on a Cholera bed, with 1 bucket for stool collection underneath the hole in the bed, and 1 bucket for vomit beside the bed. The following should be put in place or provided in the admissions area:

    - Separate rooms/tents for males and females where possible.
    - Separate rooms for children, the old and pregnant women, as the risk of abortion increases with Cholera.
    - A foot bath and hand washing facilities (with disinfectant) at the entrance
    - Provision for disinfection of soiled linen and clothing.
    - Patients should have access to toilets and washing facilities (with disinfectant), or showers should be provided where possible.
    - Tables and chairs for staff.

- Refuse containers.
- Patients should be screened by medical staff, and categorized according to their status.

vi. A convalescence/recovery area

- The convalescence or recovery area is meant for oral rehydration after hospitalization, when less surveillance is required. Patients can stay on mats or benches, as in the observation area.
- Patients who are no longer vomiting, nor have diarrhoea and requiring less medical attention, can be put in this ward.
- Separate rooms/tents should be provided for male and female patients.

Annex 6I: Response to radiation/nuclear and chemical events

A. RADIATION EVENT

1. Response to Radiological events

If an accident is suspected:

- Prevent inadvertent ingestion of contamination (e.g., wear gloves, do not smoke or eat).
- Perform life saving measures, and immediately provide first aid for serious injuries, before
- conducting radiological monitoring.
- Keep people away from any potential source of exposure (at least 10m).
- Arrange transport for seriously injured people to a local health facility.
- Wrap them in a blanket to control the spread of contamination. Inform both those transporting
- victims, and the receiving health facility, that the person may be contaminated. Also advise them that the risk to those treating such a patient is negligible, but sufficient care should be taken to prevent inadvertent ingestion of the contaminant.
- Identify and register potentially exposed/contaminated individuals.
- Gather information, including signs and symptoms, and a description of events, that could be useful in reconstructing their dose.
- Report to appropriate officials, and obtain further instructions.

If not seriously injured, remain in the area until monitored.

2. Respond to action threshold

If an accident is confirmed:

- Reassess and review with relevant departments and agencies the necessary medium to long term
- protective actions, such as food chain restrictions.
- Provide the population with useful, timely, truthful, consistent and appropriate
- information as to the likely health effects of the emergency, by referring to any existing
- knowledge.
- Arrange for detailed clinical and radiological review of affected persons.
- Promptly provide the public with the results of any medical examinations.
- Establish and maintain an appropriate disease surveillance programme.
- Establish a registry of persons to be tracked, and to receive long-term follow-up.
- Include objective criteria in the registry that indicates the potential for an increase in the incidence of radiation induced cancer.
- Begin surveillance of any identified groups at risk, e.g., screening for Thyroid disease in children, in an area affected by radioactive iodine release.
- Assist government authorities in planning a return to normal life for the population affected.

3. External contamination

- Use instrumental contamination monitoring.
- Use cotton swabs for skin, nostrils, ear canals, wounds or any contaminated object.
- Each swab should be placed in a labelled test tube for counting.

4. Internal contamination

- Use instrumental detection methods such as whole body counting, gamma camera, thyroid counting. Radionuclides may be in the blood, or excreted in the faeces or urine. Excreta should be placed in appropriate containers, and blood samples in test tubes for counting.

5. Decontamination Procedures

- Materials: Lukewarm water, soap or ordinary detergent, soft brush, sponges, plastic sheets, tape, towels, sheets, iodine tablets or solution.
- Procedural priority: Remove all clothing and place in plastic bags. First carry out life saving measures.
- Identify and mark contaminated areas, clearly, and cover them until decontamination can take place.
- Start with decontamination of wounds if present, and move on to the most contaminated area of the body.

6. Local contamination

- Cover uncontaminated area with plastic sheeting and tape the edges. Soak the contaminated area, gently scrub with soap, and rinse thoroughly. Repeat the cycle, and observe changes in activity. One cycle should not last longer than about 2–3 minutes. Avoid vigorous scrubbing. A stable isotope solution may facilitate the process.
- For wounds, irrigate with normal saline solution repeatedly. Surgical debridement may be necessary in some instances. Eyes and ears may be irrigated gently with isotonic saline solution.

7. Extensive contamination

- Shower those that are not seriously injured. Bathing may be done on the operating table or stretcher, for the seriously injured.
- Soak– scrub–rinse cycle should also be observed.

8. Inhalation

- Irrigate nasopharynx and mouth.

9. Ingestion

- Administer cathartics for insoluble materials. Administer diuretics by forcing fluids for soluble contaminants.

10. Prophylactic measures

- Cover areas still contaminated with plastic sheeting and tape the edges. Gloves should be worn on the hands.
- After allowing the skin to rest, repeat washing.

11. Treatment

- Erythema and dry desquamation can be treated symptomatically. Lotions or sprays containing hydrocortisone can be used to relieve the symptoms associated with severe erythema, accompanied by oedema. To treat moist desquamation, daily dressings and bathing of the affected skin in antiseptic solutions is helpful. Antibiotic creams can also be used.
- For ulceration, isolation of the limb in a sterile environment, or daily dressing and bathing of the ulcer in antiseptic solutions is recommended. Analgesics or stronger opioids may be necessary. In the event of suspected or verified secondary infection, topical or systemic antibiotic therapy should be considered.
- For necrosis, only surgical treatment is effective. Surgical toilet is indicated. Excision of deep necrosis followed by skin grafts, or other kinds of grafting may be conducted when indicated.
- Indications for amputation include very severe lesions with destruction of underlying tissues, including vascular damage, intractable pain and lack of infection control.

12. Expected outcome

- Radionuclide activity is no longer detectable or is decreasing.

B. CHEMICAL EVENT

1. Response to chemical event/attack

Components of rescue and medical services:

- Search and rescue teams.
- Emergency medical teams used for day-to-day emergencies (medical officers, nurses, first aiders, ambulance).
- Field medical services (field medical teams and posts).
- Medical emergency response plans and procedures.
- Personnel and equipment to reinforce the resources available for day-to-day emergencies.
- A transport service for medical evacuations.
- Hospitals with casualty and surgical units.

2. At the emergency site

- Operate as close as possible (but within safe distance) to the emergency site.
- Collaborate closely with different rescue teams (engineering, fire fighters, decontamination and human rescue groups).
- Ensure all rescue workers don appropriate PPEs.
- Assess the situation to determine that there is no eminent danger.
- Rescue teams should locate casualties and remove them from danger.
- Rescue teams should do primary medical assessments, to identify and manage life threatening conditions.

  Assess:
  - Airway;
  - Breathing; and
  - Circulation.

- Rescue team should provide first aid, and record details of first aid provided, before forwarding casualties to field medical teams.
- Field medical services post/s: Establish field medical post/s.
- Field medical teams perform primary/secondary medical assessment.
- Assign triage category to casualties, based on the medical assessment.
- Initiate appropriate treatment.
- Prepare casualties for evacuation to hospital, according to triage category.
- Continue documentation of casualties.
- Provide surveillance of casualties awaiting evacuation.
- Liaise with casualty transport service.
- Evacuate casualties to appropriate medical facilities, according to priorities.
- Ensure continuity of medical care for casualties along the whole length of the chain, from the emergency site to the hospital.
- Provide information to receiving medical facilities as necessary.
- Treat minor injuries not requiring hospitalization.

3. Hospital service

- Prepare for casualty reception.
- Do a medical assessment to identify and manage life-threatening conditions.
- Assign triage category based on assessments.
- Provide appropriate treatment, according to triage priorities and available hospital resources.
- Continue medical documentation of casualties.
- Undertake surgical procedures where necessary.
- Provide post-operative care and release casualties.

4. Recognizing and diagnosing health effects of chemicals in chemical events

i. Decontamination and treatment

Agent type	Decontamination	First Aid Access ABC's	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.
Asyphxiant/ Blood Arsine	Remove clothing immediately-if no frostbite. Gently wash skin with soap and water.	Rapid treatment with oxygen. For cyanide, use antidotes (sodium nitrate 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 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 I duration with the amount.
Blistering/Vesicant	Immediate decontaminate 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.	Immediate 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 that causes immediate pain.
Incapacting/ behaviour altering	Remove clothing immediately. Gently wash skin with 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 target risks. Hard to detect because it is an odorless and non-irritating substance. Possible serious arrhythmias. Specific antidote (physostigmine) may be available.

ii. Antidote recommendations following exposure to cyanide

Patient	Mild (Conscious)	Severe (Unconscious)	Other treatment
Child	Antidotes may not be necessary.	Sodium nitrite: 12-0.33ml/kg, not to exceed 10ml of 3% solution. Slow IV no less than 5 minutes, or slower if hypotension (low blood pressure) develops. Sodium thiosulfate: 1.65ml/kg of 25% solution IV over 10-20 minutes.	For sodium nitrite-induced orthostatic hypotension, normal saline infusion and supine position are recommended. If still apnoeic after antidote administration, consider sodium bicarbonate for severe acidosis.
Adult	Antidote may not be necessary.	Sodium nitrite: 10-20ml of 3% solution slow IV over no less than 5 minutes, or slower if hypotension develops and Sodium thiosulfate: 50ml of 25% solution IV over 10-20 minute.s	

! 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 the gastric contents of victims who may have ingested cyanide-containing materials.
3. Victims exposed only to hydrogen cyanide gas do not pose a contamination risk 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. This is available in the Pasadena Cyanide Antidote Kit, formerly Lilly Cyanide Kit.

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SECTION 7

RISK COMMUNICATION

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7. Risk Communication and Community Engagement (RCCE)

RCCE is an essential element of disaster and emergency preparedness and response, and is one of the core capacities in the IHR (2005). RCCE is a two-way exchange of information, perceptions, and advice among risk assessors, risk managers, and various groups of people in the society, about the likelihood and consequences of harm from the event (WHO, 2005). Its ultimate purpose is that everyone at risk can make informed decisions to mitigate the effects of the threat (hazard), such as a disease outbreak, and take protective and preventive action. RCCE uses a mix of communication and engagement strategies and tactics, including but not limited to, media communications, social media, mass awareness campaigns, health promotion, stakeholder engagement and social mobilization.

The 21st century has witnessed an exponential growth in travel, trade, and migration, coupled with a revolution in communication technology, providing massive access to a variety of means of communication and information. The public and communities have been part of ,and 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 is a complex task, and a core public health intervention in any response to disease outbreaks/epidemics, pandemics, and other health emergencies. *(Source: Communicating Risk in Public Health Emergencies: Geneva. World Health Organization 2017, License CC BY-NC-SA 3' IGO)*.

It is therefore important for risk communication to be carried out effectively, to promote the primary public health goal of rapid outbreak containment, preventing avoidable disease and death, together with the least possible disruption to economies and society. During epidemics and pandemics, humanitarian crises and natural disasters, effective risk communication allows people most at risk to understand and adopt protective behaviours. It allows authorities and experts to listen to and address people's concerns and needs, so that the advice they provide is relevant, trusted, and acceptable.

This section describes how to conduct risk communication before, during and after an outbreak. Effective communication provides those at risk with the knowledge to make informed decisions for protective action, when linked to a well-functioning service. It also provides decision makers with summary information, especially if there was an outbreak response, allowing them to review how resources were utilised to contain the event.

7.1 RCCE in the context of IDSR

Integrated Disease Surveillance and Response (IDSR) is a strategy for improving public health surveillance and response for priority diseases, conditions and events at community, health facility, district, regional and national levels. Since IDSR is a system with the potential to ensure a reliable supply of information to the national level to fulfil IHR requirements, risk communication should be integrated in all the IDSR core functions and activities particularly detection, sample collection, reporting, analysis, interpretation, feedback, response, and preparedness. The 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 is therefore needed to achieve the objectives of IDSR.

If well planned and integrated into IDSR, risk communication 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 and implemented as well as properly integrated with emergency management activities and operations at community, facility, district, region and national levels, to support all the relevant core IDSR functions and related activities at all levels.

7.1.1 Benefits of Risk Communication

Risk communication improves decision-making, compliance with treatment, and required behaviours for preventive actions. It promotes transparency and accountability, and builds trust with individuals, community leaders, health workers and policy makers. When risk communication is effectively carried out, it promotes the primary public health goal of rapid outbreak containment, preventing avoidable death and disease, and with the least possible disruption to economies and society. During epidemics, pandemics, humanitarian crises and natural disasters, effective RCCE allows people most at risk to understand and adopt protective behaviours. It allows authorities and experts to listen to, and address people's concerns and needs, so that the advice they provide is relevant, trusted, and acceptable. It is critical that RCCE strategies and plans are not only targeted at outbreak response, they should also include activities before the outbreak, during the outbreak and after the outbreak.

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. Communicating advice and guidance, therefore, often stands as the first, and most important public health tool in managing a risk. Pro-active risk communication encourages the public and service providers to adopt protective behaviours, when they are linked to well-functioning systems and services. It facilitates heightened disease surveillance, reduces confusion, and minimizes miscommunication and rumours in relation to the cause, transmission of a disease, and proven effective prevention and protective actions. It also ensures better utilisation of resources. All of these are necessary for an effective response (WHO, 2008).

7.1.2 Target audiences for risk communication

- Community: All people at risk of acquiring disease, or in need of health services within the context of the public health event;
- Health-care providers and first responders;
- Private health facilities staff;
- Regional and district management teams;
- Surveillance focal persons;
- Laboratory staff;
- Airlines staff.;
- Immigration officers;
- Port health officials.;
- Travellers;
- Stakeholders (policymakers, other line ministries, maternal and child health organizations, partners, community organizations, CSOs, NGOs, FBOs, etc.);
- Media houses as a channel to reach these audiences;
- Schools and workplaces;
- Traditional and religious leaders; and
- Any other relevant audience.

7.1.3 Community engagement and its importance in public health emergency preparedness and response

In conducting risk communication, community engagement is an important aspect of the process. Community engagement is the process of working collaboratively with, and through communities affiliated by geographic proximity, special interest, or similar situations, to address issues affecting their well-being. It is used as an active method of implementing change.

The emphasis during risk communication is on building relationship and trust.

The steps for community engagement are as follows:

i. Determine the goals of the plan;
ii. Plan out who to engage;
iii. Develop engagement strategies;
iv. Prioritize those activities;
v. Create an implementation plan;
vi. Monitor your progress; and
vii. Evaluate and re-plan.

Effective community engagement helps you to:

- Know the community (problems and needs);
- Understand the existing health beliefs, attitudes and practices;
- Listen to the community carefully;
- Analyse community dynamics; and
- Involve the community in all aspects of the response, starting from the planning stages until the end of the outbreak.

7.1.4 Approaches for Risk Communication

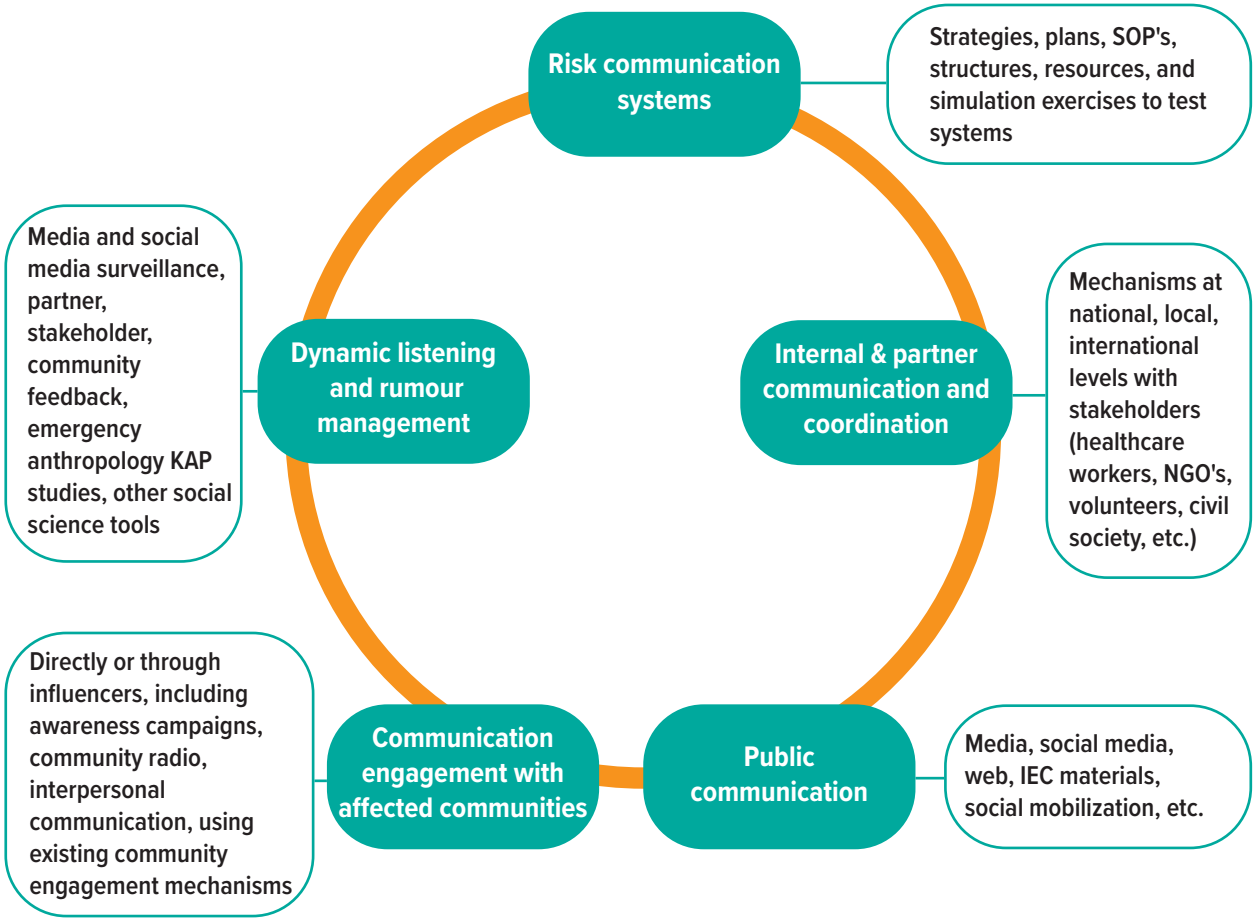
The components of risk communication needed for effective response during the emergency include:

a. Health education;
b. Social mobilization;
c. Community engagement;
d. Media and social media;
e. Outbreak communication;
f. Crisis communication;
g. Messaging (Information Education and communication (IEC) and Behaviour Change communication (BCC);
h. Rumour monitoring and managing; and
i. Advocacy.

7.1.5 Integrated Risk Communication Model

Since risk communication is a complex activity involving different audiences, having an integrated approach is crucial. The key components for integrated emergency risk communication are indicated in Figure 7.1, on page 294. This model allows for the successful design and implementation of an effective communication strategy. It further highlights the necessity of a collaborative approach between different target audiences across the board.

Figure 7.1: Integrated Risk Communication Model



7.2 Key inter-linked principles for effective communication

There are 5 key principles for effective communication as outlined below:

1. Creating and Maintaining Trust

Building and maintaining trust is, arguably, the most important function of an effective communication strategy 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, and
c. actionable advice on protective actions people can take, linked to functioning services to increase self-efficacy.

This creates trust in the response, in the response teams, and increases the likelihood that they follow the advice that is given.

Trust is now considered the most important requirement for effective risk communication.

According to the latest evidence, risk communication in health emergencies should include ensuring genuine participation of the population. taking into account three key elements:

- The understanding of that population's specific context, concerns, beliefs, practices and traditions so as to shape scientific and logistic information, and explanations that address community concerns (social science intelligence);
- Provision of understandable and trusted advice in local languages and adapted to their educational levels and preferences (i.e., oral or visual), on channels and through interlocutors of their choice, (translational communication), that they are likely to follow to save lives, and bring the outbreak under control in the shortest possible time; and
- Meaningful community engagement and the participation of (their) trusted interlocutors/messengers (means of dissemination).

NOTE: **Risk communication should include timely, transparent, understandable information to affected and at-risk populations about:**

- **the nature of health risk they face,**
- **what is being done as the response, and**
- **what they can do to protect themselves and those important to them.**

Trust is thus the currency for all public health interventions, and has, in an era of information overload, emerged as the critical element for effective risk communication (i.e., that the expert advice is acted on by key stakeholders, and affected and at-risk populations). Risk communication should therefore aim at building, maintaining, or restoring the trust of the public, in those charged with the responsibility of managing the risk.

The latest evidence from 21st century epidemics highlights that to build trust, risk communication interventions should:

- Be linked to functioning and accessible services;
- Be transparent and timely;
- Be easy to understand for target populations (see above);
- Acknowledge and communicate uncertainty (i.e., don't over-reassure, don't speculate, but communicate frequently so that the evolution of an event and the understanding of it, is transparent and not a cause of destroying trust);
- Link to self-efficacy (i.e., Can people really do what you ask them to do? Do they have the ability, equipment, services, education they need to adopt our advice?);
- Be disseminated using multiple platforms, methods and channels; and
- Identify, involve and collaborate with people that the community trusts in decision-making, and not just in information dissemination. This ensures that interventions and the communication about them are contextually appropriate and community-owned.

2. Timely announcements and transparency

In most cases, the public response to a health threat depends on how the first, and subsequent announcements are made. This necessitates announcing an event or threat 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.

Communication by authorities, response managers or front-line personnel must include:

- Information about the uncertainties associated with the risk, event and interventions;
- Indicate what is known and not known at a particular moment in time;
- A commitment, and follow-up to keep people frequently informed, and updated with the changing, uncertain situation; and
- Multiple platforms, mechanisms and trusted panellists to ensure that consistent and coordinated information reaches stakeholders and affected communities at large.

3. Listening to, understanding and respecting public concerns

Understanding public perceptions, concerns, fears and expectations is as critical for risk communication as understanding the risky practices and behaviours that affect risk. The understanding of communities must start before an emergency, as well as during an emergency. There are many ways to listen to the concerns of a community, and understand the contexts that influence whether the advice for corrective or preventive practices given to them, will actually be accepted and acted upon. These include Knowledge, Attitude, 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, using these methods and other social science approaches, to make health interventions and give health advice, based on the evidence gathered..

4. Advance Planning

RCCE is most effective when it is integrated with emergency preparedness, risk analysis and response (risk management). This means that a RCCE plan must be prepared during the preparedness stage. Emergency risk communication planning must occur in advance, and should be a continuous process, with a focus on preparedness and prevention, as well as response. Planning should be sensitive to the community's needs. It should be participatory, responsive to the context, and incorporate feedback from affected community groups.

The IHR (2005) requires all governments to build national capacity for detection, alert and response to public health emergencies. One of the core capacities are for risk communication. Accordingly, risk communication planning should include the systems required (strategies, plans, SOPS, and mechanisms at national, regional and district levels); the coordination of partners, sectors, stakeholders; capacity for fast, effective public communication in languages and channels of the populations' preference; ability to track and quickly manage concerns, perceptions, rumours and misinformation; and communication engagement with affected and at-risk communities.

5. Ensuring Equity

All citizens have the right to receive 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. RCCE must therefore ensure equitable sharing of information to the public, and avoid exclusion of marginalized members of society from any health action. This means paying particular attention to the extent of the communication provided, using trusted channels and panellists. Ensure that communication is given in local languages, at their level of understanding and education, and avoiding the use of jargon or technical language. Also ensure 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 those hardest to reach (women, minorities, the elderly and youth, people with disabilities, the poor, pastoral communities, migrants, and refugees, etc.).

7.3 Create an enabling environment for effective communication to the populations at risk

(i) Establish risk communication systems and structures

- Review the existing structure and mechanisms for risk communication
- Establish multi-sectoral communication committees/ structures across all levels - national, regional, and district levels, if not already in place. Terms of Reference (TOR) can be expanded depending on the pre outbreak, outbreak and post outbreak phase. in line with each function.

See Annex 7F at the end of this section which contains an expanded list of possible stakeholders.
See Annex 5E which describes the members, and roles of the RCCE subcommittees.

(ii) Ensure that the communication system has a link to the community leadership structure as they have a strong influence in the community.

A quick assessment can be made to evaluate the framework for public health emergency risk communication, and this can include:

- Identify risk communication needs, based on risk profile;
- Conduct mapping of risk communication stakeholders at all levels and develop a database; and
- Conduct resource mapping for risk communication.

(iii) Conduct mapping of languages and dialects, religions, preferred and trusted means/channels/ and panellists (sources) for communication, and traditional practices that are relevant for the top priority health risks, and use this intelligence to shape risk communication strategies and plans.

(iv) Identify a government spokesperson for district, regional level, and ensure he/she is trained in procedures for public communication.

(v) In addition to RCCE members, all frontline personnel should receive basic training in risk communication (surveillance, contact tracing, case management, social mobilization, community engagement, burial teams, health personnel, and volunteers).

(vi) Develop a Risk Communication Plan for Public Health Emergencies for all levels, and ensure that key stakeholders are oriented on the procedures for risk communication.

(vii) Develop a coordination platform and mechanisms for internal and partner communication, including their roles and responsibilities, for engaging key stakeholders including media outlets, and community radio networks.

(viii) Prepare a detailed budget and advocate strongly for resource mobilization and multi-sectoral collaboration, to implement public health emergency and risk communication activities at all levels.

(ix) Create a system for dynamic Listening and Rumour Management.

See Annex 7E at the end of this section, for a checklist for monitoring risk communication.

7.4 Communicating before, during and after the outbreak

7.4.1 Pre-Outbreak/Routine Risk Communication

For better preparedness, a large proportion of communication activities should be implemented in the pre-emergency phase. People managing communication activities should take advantage of the absence of an emergency to build the country's communication capacity, and develop communication plans and tools to bring the nation to a high level of communication preparedness. The pre-emergency phase should also be used to develop the necessary communication messages and materials, and promote the practice of behaviours that can prevent the risk. This is also the ideal time to develop and maintain relationships between the RCCE Team and the general public.

Before an outbreak, the following should take place:

- The sub-committees for RCCE should meet at least once monthly, or quarterly to:
    - review the risk communication plan and the required risk communication materials/logistics;
    - develop, pre-test, print and disseminate appropriate IEC materials based on the common public health risk.
    - organize training of risk communication resource teams.
- Ensure that communication coordination mechanism is in place, with clear terms, and clearly defined roles and responsibilities of each entity.
- Organize periodic interactions with stakeholders who will be involved in risk communication, for prevention and preparedness, or in response should an event or emergency occur.
    - This includes district, regional or national media, community radio, civil society, and stakeholders from other sectors e.g., animal health sector for the purpose of zoonotic diseases.
- Review past emergency communication interventions to draw lessons learned, build on successful practices, and address identified challenges.
- 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 spokesperson 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 SOPs for social mobilization and community engagement, and ensure integration of risk communication in the overall emergency response plan.

- Identify and prepare database of stakeholders and partners, such as groups or organizations that focus on youth or women, schools, religious institutions, CSOs, 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 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 should be used for the use of communication practitioners at all levels.

- Establish communication lines with media, journalists, and radio/TV stations, orient them and keep them up-dated continuously.

- 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 mobilizers in risk communication.

- Identify mechanisms for communicating with hard-to-reach and vulnerable populations (elderly, persons with disabilities, children, and pastoral communities). and with people who are isolated, in order to ensure that they will have access to health protection information and assistance.

- Define communication channels to be used to reach vulnerable groups.

- Disseminate messages on the actions of government to protect the public and healthcare workers, promote awareness of the coming health threat, and preventive behaviours and actions that individuals, families and communities can take to reduce the risk. This can be done through mass media e.g., local community radio, public health address, community drama groups, TV, and print media, as well as social media (Facebook, websites, Twitter, etc).

- Conduct community engagement activities and build trusted relationships between those in authority and communities, through training/education, dialogue, consultations, and capacity building. It is important to note that effective community engagement relies on having trusted relationships between those in authority and communities, so use every opportunity to strengthen these relationships in "peacetimes."

- Use ongoing health education, health promotion and other means to create, test and build trust in the systems, and panellists that can be used in emergencies for risk communication.

- Make arrangements for a hotline facility, which can be started immediately when the emergency occurs.

- Establish a media monitoring team to monitor the news and social media.

- Maintain and update the list of media houses.

- Develop plans for the routine monitoring of misinformation and rumours, and set up a media monitoring system for keeping track of behaviours and practices related to the emergency.

NOTE: Social science data should be gathered and integrated where possible. Data on the context, socio-cultural information (including education, traditional practices, health seeking and health care-giving behaviour, and beliefs), relevant to priority hazards and epidemic–prone disease should also be obtained. This will help epidemiological data to be contextualized, and for real intelligence to be obtained based on the risks, to guide possible health interventions.

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 organize, and resources may be few. Communicating advice and guidance, therefore, is often 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.

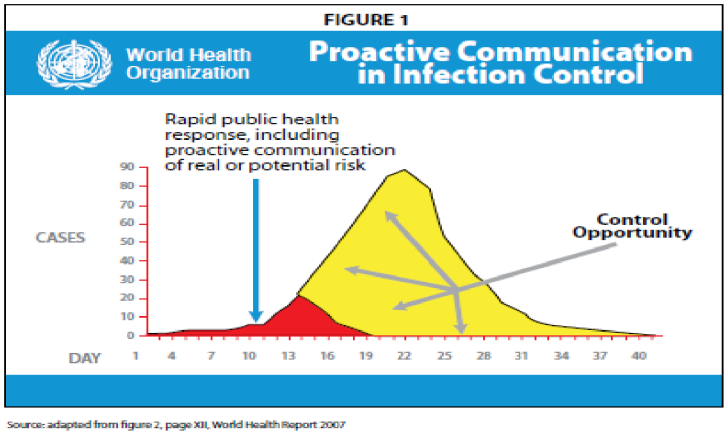
Pro-active communication encourages the public to adopt protective behaviours, facilitates enhanced disease surveillance, reduces confusion and fear, and allows for a better use of resources, all of which are necessary for an effective response. Pro-active communication also shows that health authorities are in control of the situation, care about the public, and builds trust between them and the community at large.

People have a fundamental right to information and to participation. In addition to the public health objectives, bear in mind that people have a right to information on protective actions and 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 the control opportunity i.e., the number of cases which could be avoided with 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. Effective communication can help limit the spread of a disease and ultimately save lives. It also minimizes damage to societies and economies and can help communities recover faster from a health event or emergency.

Figure 7.2: Epidemic curve showing the importance of proactive communication



Source: adapted from figure 2, page XII, World Health Report 2007

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 an uncoordinated effort and duplication of activities. Provision of timely and accurate information through a well-coordinated mechanism is important.

Internal coordination of communication among national stakeholders is key during an emergency. The "RCCE Committee" which has been described in Section 5, has the responsibility of ensuring that there is an internal communication system among national stakeholders, to ensure that information flows to different government sectors on time.

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 the end of this section, for a list of the potential partners and stakeholders that can be involved.

It establishes routine communication structures among health workers, the community and stakeholders. It helps ensure that this vital link is available and functional during an emergency. If a district, region/ national level has a Risk Communication 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 IMS through the PHEMC, 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 are transparent and accurate, and take into account community experiences and expectations regarding the outbreak.

Distinguish between communication with stakeholders who are experts, and those who are part of the response, and require a more layman's description and explanation. They, and other important panellists such as the media, civil society, and the general population, will require targeted and adapted products and messages. This means that it is essential to carefully segment and target audiences, and adapt materials, messages and mechanisms to suit each of them.

7.4.2.2 Communicate with the affected community and stakeholders

Communication between health workers, affected communities and stakeholders, including the media, is essential during outbreak and event response.

Options for communicating between the various partners can range from:

- Press releases, press conferences, TV and radio messages, and meetings (health personnel, community, religious, opinion and political leaders);
- Educational and communication materials (posters, fliers);
- Multi-media presentations (e.g.,, films, video or narrated slide presentations), at markets, health centres, schools, women's and other community groups, service organizations, religious centres, and local community media;
- Electronic and social media (Facebook, Twitter, WhatsApp, etc.), SMS, telephone, fax, email and hand-carried message;
- Community drama groups/play group; and
- Site visits.

Regardless of the mechanism, ensure that the focus is on transparent and trustworthy communication that considers community experiences.

Ensure that the messages are:

- Clear and understandable to the audience: What, why and how it is happening? What threats to health 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 to the levels of understanding of the audience? Research shows that risk should not be explained in technical terms.
- Consider these factors when providing messages: Who is your audience? What do you want your audience to do after provision of this message? Do they have the enabling environment to do as advised? Are there functioning and accessible services that enable them to follow the advice?
- Promote Dialogue: promote a two-way communication exchange. Listen to the audience's concerns ,and respond appropriately rather than just informing.
- Demonstrate empathy and caring: Are you showing empathy for their suffering? Are you being too cold and clinical? Are you respectful?
- Harmonized and consistent messages: ensure that consistent messaging goes to the public, notwithstanding the different partners involved in the dissemination of information. Use message maps and other tools to keep the same frame and logic for the messaging, but allow 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 of continuous collation of facts and figures of the public heath event
- Update public information messages and share them with players involved in information dissemination.
- Relevance: communicate data/information that best illustrates your point and takes their concerns into consideration.

Use examples that relate to the audience.

NOTE: Consider pre-testing the messages from similar settings, before dissemination.

In case of rumours, quickly respond to them and any inaccuracies in general, and especially within the specific audience where they have occurred. 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, and 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 authorized and credible persons should communicate during the crisis period.

On a regular basis, district and regional medical officers should meet with local leaders to give:

- Frequent, up-to-date information on the outbreak and response;
- Clear and simple health messages for the media; and
- Clear instructions to only communicate information and health education messages received from the PHEMC, to the media.

7.4.2.3 Develop fact sheets

Fact sheets are brief summaries of 1 to 2 pages, usually prepared by health staff for consumption by the general public, and deal with a single topic or message. For example, a fact sheet on a *Shigella* outbreak in a district may contain the following information for the community: the cause of *Shigella*, how it is transmitted, and steps for prevention. 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, or scripts, and into visual products (like posters or infographics). This is useful in situations where oral or visual/written/ illustrated communication is more easily understood or preferred.

See Annex 7A at the end of this section, for an example.

Distribute any other IEC materials which have been prepared. 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

The national level or region regularly publishes a national public health bulletin, but during an outbreak, these reports will be produced more often, and will describe the outbreak including the developing trend, i.e., Situation Reports (SITREPs). These situation reports or bulletins, have a wider audience than just the health staff in a particular district or health facility. They are usually brief, consisting of 2 to 8 pages. They are seen by policy makers, legislators and other decision-makers. They are a valuable channel for reaching technical and donor partners.

The bulletins contain at least:

- A summary table showing the number of reported cases and deaths to date, for each priority disease;
- Highlights or key messages on a given disease or topic; and
- Inclusion of any relevant social science data on risky practices, behaviours and other factors.

If a national public health situation report is sent to the district office, display it where everyone can see it. Make copies and distribute them 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.

See Annex 7C at the end of this section, for a sample template of a situation report.

7.4.2.5 Communicating to media

The media is a major influence and should be seen as a partner in risk communication. 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 be based on facts and evidence. Therefore,

it is essential to meet regularly with, and brief and educate the media on priority hazards and response systems, and provide them with appropriate information so as to cultivate a respectful and trusted relationship with them. The media will enable a wider dissemination of messages on radio, or other appropriate means.

As part of your risk communication plan, determine how you will announce news of the outbreak, and then how you will 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.

Ensure that you have reached out to media prior to the outbreak, and have identified the key outlets you will need to work with during an outbreak.

It is also good to identify the clearance process for media products prior to an emergency, and take note of the following:

- Ensure prompt and frequent access to experts, officials and spokespersons who will speak authoritatively and credibly on the issue at hand.
- Provide media training for spokespersons.
- Spokespersons must be the ones who could speak in lay language and explain scientific ideas and terms well, those who do not speak in jargon, and those who illustrate the information with easy-to-understand stories or examples. Talking points could be used, with messages kept as simple as possible, using the latest information. Please ensure that spokespersons can also communicate the uncertainty in an evolving event, and admit when they don't know something. Community case definitions and job aids will aid the spokesperson to deliver correct messages.
- Promptly answer calls from the media, as a show of respect and appreciation to them.
- Give them accurate and well explained information.
- Give exclusive stories and interviews to provide a different perspective.
- Provide human interest stories.
- Give them clear easy to use handouts (written, audio, visual or audio-visual).

NOTE: Release information to the media only through the spokesperson ,to make sure that the community receives clear and consistent information.

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 how to correct this misinformation.

7.4.2.6 Communicating to health workers

Communicate regularly with the health workers by providing correct information pertaining to the outbreak. It is important to communicate with health staff from different levels about the data sent (including any gaps), results of the analysis of this data, and measures that are being taken to respond to the potential public health event which they have reported.

Communication can also include providing participating healthcare workers with any outbreak or event response reports for future reference.

Make sure that health workers provide the correct information on the number of cases, and any death that has occurred. Ensure that any changing information regarding case management, or any other response intervention is also provided.

Encourage health workers to keep updated, and update them in real-time during an event or emergency, using reliable sources such WHO's knowledge transfer platform (www.OpenWHO.org), on common, re-emerging and emerging epidemic-prone diseases, and on risk communication.

Increasingly during an emergency response to disease outbreaks, MoHSS with the support of partners, will provide real-time online, off-line or face-to-face training to update healthcare workers and response teams. These provide an opportunity for knowledge and skills updating, or for acquiring new knowledge or skills.

7.4.3 After/Post Outbreak Response

7.4.3.1 Prepare an outbreak or event response report

After an outbreak or event response has taken place, the district 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, decisions taken, and recommendations made. Make sure that the health unit that reported the initial cases receives a copy of the report.

See Annex 7B and Annex 7D at the end of this section, for an example of a recommended format and sample.

7.4.3.2 Evaluate lessons learned 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 Plan

Carry out simulations to test the Risk Communication 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, IAR/AAR or any other assessments that were done.

Refer to: www-OpenWHO.org, for ready-made desktop and other simulation exercises developed by WHO.

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Annex 7A: Fact Sheet

Influenza A Virus

General information about Avian Influenza A Virus Infections in humans

(Reference http://www.who.int/influenza/human_animal_interface/FAQ_H7N9/en/)

Influenza A H7 viruses are a group of influenza viruses that normally circulate among birds. The influenza A (H7N9) virus is one subgroup, among the larger group of H7 viruses. Although some H7 viruses (H7N2, H7N3 and H7N7) have occasionally been found to infect humans, no human infections with H7N9 viruses have been reported, until recent reports from China. What are the main symptoms of human infection with influenza A (H7N9) virus?

Thus far, most patients with this infection have had severe pneumonia. Symptoms include fever, cough, and shortness of breath. Information is however still limited about the full spectrum of disease that infection with influenza A (H7N9) virus might cause.

Why is this virus infecting humans now?
We do not know the answer to this question yet, because we do not know the source of exposure for these human infections. However, analysis of the genes of these viruses suggests that although they have evolved from avian (bird) viruses, they show signs of adaption to growth in mammalian species. These adaptations include an ability to bind to mammalian cells, and to grow at temperatures close to the normal body temperature of mammals (which is lower than that of birds).

What is known about previous human infections with H7 influenza viruses globally?
From 1996 to 2012, human infections with H7 influenza viruses (H7N2, H7N3, and H7N7) were reported in the Netherlands, Italy, Canada, United States of America, Mexico, and the United Kingdom. Most of these infections occurred in association with poultry outbreaks. The infections mainly resulted in conjunctivitis, and mild upper respiratory symptoms, with the exception of one death, which occurred in the Netherlands. Until now, no human infections with H7 influenza viruses have been reported in China.

Is the influenza A (H7N9) virus different from influenza A (H1N1) and A (H5N1) viruses?
Yes. All three viruses are influenza A virus but they are distinct from each other. H7N9 and H5N1 are considered animal influenza viruses, that sometimes infect people. H1N1 viruses can be divided into those that normally infect people, and those that normally infect animals.

How did people become infected with the influenza A (H7N9) virus?
Some of the confirmed cases had contact with animals, or with an animal environment. The virus has been found in a pigeon in a market in Shanghai. It is not yet known how persons became infected. The possibility of animal-to-human transmission is being investigated, as is the possibility of person-to-person transmission.

How can infection with influenza A (H7N9) virus be prevented?
Although both the source of infection and the mode of transmission are uncertain, it is prudent to follow basic hygienic practices to prevent infection. They include hand and respiratory hygiene, and food safety measures:

Hand hygiene:

- Wash your hands before, during and after you prepare food;
- before you eat;
- after you use the toilet;
- after handling animals or animal waste;
- when your hands are dirty; and
- when providing care when someone in your home is sick.

Hand hygiene will also prevent the transmission of infections to yourself (from touching contaminated surfaces), and in hospitals, to patients, healthcare workers and others. Wash your hands with soap and running water when visibly dirty. If not visibly dirty, wash your hands with soap and water, or use an alcohol-based hand cleanser.

Respiratory hygiene:

- Cover mouth and nose with a medical mask, tissue, or a sleeve or flexed elbow, when coughing or sneezing;
- throw the used tissue into a closed bin immediately after use; and
- perform hand hygiene after contact with respiratory secretions.

Is it safe to eat meat, i.e. poultry and pork products?

Influenza viruses are not transmitted through consuming well-cooked food. Because influenza viruses are inactivated by normal temperatures used for cooking (food reaches 70°C in all parts i.e., "piping" hot and no "pink" parts), it is safe to eat properly prepared and cooked meat, including from poultry and game birds. Diseased animals and animals that have died of diseases, should not be eaten. In areas experiencing outbreaks, meat products can be safely consumed, provided that these items are properly cooked and properly handled during food preparation. The consumption of raw meat and uncooked blood-based dishes is a high-risk practice, and should be discouraged.

Is it safe to visit live markets and farms in areas where human cases have been recorded?

When visiting live markets, avoid direct contact with live animals, and surfaces in contact with animals. If you live on a farm and raise animals for food, such as pigs and poultry, be sure to keep children away from sick and dead animals, keep animal species separated as much as possible, and report immediately to local authorities any cases of sick and dead animals. Sick or dead animals should not be butchered and prepared for food.

Is there a vaccine for the influenza A (H7N9) virus?

No vaccine for the prevention of influenza A (H7N9) infections is currently available. However, viruses have already been isolated and characterized from the initial cases. The first step in development of a vaccine is the selection of candidate viruses that could go into a vaccine. WHO, in collaboration with partners, will continue to characterize available influenza A (H7N9) viruses to identify the best candidate viruses. These candidate vaccine viruses can then be used for the manufacture of vaccine if this step becomes necessary.

Does treatment exist for influenza A (H7N9) infection?

Laboratory testing conducted in China has shown that the influenza A (H7N9) viruses are sensitive to the anti-influenza drugs known as neuraminidase inhibitors (Oseltamivir and Zanamivir). When these drugs are given early in the course of illness, they have been found to be effective against seasonal influenza virus and influenza A (H5N1) virus infection. However, at this time, there is no experience with the use of these drugs for the treatment of H7N9 infection.

Is the general population at risk from the influenza A (H7N9) virus?

We do not yet know enough about these infections to determine whether there is a significant risk of community spread. This possibility is the subject of epidemiological investigations that are taking place.

Are healthcare workers at risk from the influenza A (H7N9) influenza virus?

Healthcare workers often come into contact with patients with infectious diseases. Therefore, WHO recommends that appropriate infection prevention and control measures be consistently applied in health care settings, and that the health status of healthcare workers be closely monitored. Together with standard precautions, healthcare workers caring for those suspected, or confirmed to have influenza A (H7N9) infection should use additional precautions.

Does this influenza virus pose a pandemic threat?

Any animal influenza virus that develops the ability to infect people, is a theoretical risk to cause a pandemic. However, whether the influenza A (H7N9) virus could actually cause a pandemic is unknown. Other animal influenza viruses that have been found to occasionally infect people have not gone on to cause a pandemic.

Preventing human infection with Avian Influenza A Viruses

The best way to prevent infection with avian influenza A virus is to avoid sources of exposure. Most human infections with avian influenza A viruses have occurred following direct or close contact with infected poultry.

Seasonal influenza vaccination will not prevent infection with avian influenza A virus, but can reduce the risk of co-infection with human and avian influenza A virus.

Because rare episodes of limited, non-sustained human-to-human transmission of HPAI H5N1 virus has been reported, persons should avoid sick patients who have suspected, or confirmed HPAI H5N1 virus infection. Healthcare personnel caring for patients with suspected or confirmed HPAI H5N1 virus infection should wear the recommended PPE, and follow recommended infection control measures (standard, droplet, contact, and airborne precautions).

Annex 7B: Sample district outbreak report

Republic of Namibia

Ministry of Health and Social Services

Sample district outbreak report

Title/Description (include disease/condition investigated)_____

Period_____**Place (Villages, Neighbourhoods, District,Region)**_____

Executive summary:

I. Introduction:

- Background
- Reasons for investigation (public health significance, threshold met, etc.)
- Investigation and outbreak preparedness.

II. Methods:

- Dates of investigation
- Site(s) of investigation (health care facilities, villages, other)
- Case finding (indicate what was done regarding case finding, e.g., register review, contact investigation, alerting other health facilities, other)
- Lab 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 healthcare system
- Results of additional case finding
- Lab analysis and results
- With text, describe key features of results of time, place, and person analysis
- For detailed results by time (epi curve), place (map), and person characteristics (tables) and line lists
- Results of response and evidence of impact.

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

Epidemic Preparedness			
Indicator		**Yes**	**No**
Were adequate drugs and medical supplies available at the onset of the outbreak?			
Were treatment protocols available to health workers?			
Does the district public health emergency preparedness and response committee regularly meet as part of epidemic?			
Outbreak Detection			
Indicator	**Date 1**	**Date 2**	**Interval**
Interval between onset of index case (or occurrence of an unusual cluster at the community level) [date 1], to arrival of first outbreak case at the health facility [date 2] (Target: <3 days)			
Interval between initial outbreak case seen at the health facility (or date of outbreak threshold crossing at the health facility) [date 1], and reporting to the district health team [date 2] (Target: within 24 hours)			
Cumulative interval between onset of index case (or occurrence of an unusual cluster at the community or health facility) [date 1], to notification to the district [date 2] (Target: <7 days)			
Outbreak investigation			
Indicator		**Yes**	**No**
Were case forms and line lists completed?			
Were laboratory specimens taken (if required)?			
Indicator	**Date 1**	**Date 2**	**Interval**
Interval between notification of district [date 1] and district field investigation conducted [date 2] (Target: within 48 hours)			
Interval between sending specimens to the lab [date 1] and receipt of results by the district [date 2] (Target: 3-7 days, depending on type of test)			
Outbreak response			
Indicator	**Date 1**	**Date 2**	**Interval**
Interval between notification of outbreak to district [date 1] and concrete response by the district [date 2] (Target: within 48 hours of notification)			
Evaluation and Feedback			
Indicator	**Date 1**	**Date 2**	**Interval**
Interval between end of the outbreak [date 1], and finalization of outbreak report with case forms/line list sent to national level [date 2] (Target: 2 weeks)			
Indicator		**Yes**	**No**
Did the outbreak management committee meet to review investigation results?			
Was feedback given to health facilities and community?			

IV. Evaluation of other aspects of the response:

V. Interpretations, discussion, and conclusions:

VI. Recommended public health actions:

- Comment on following levels: community, health facility, district, partners, provincial, and national

District PHEMC Chairperson: _____ **_____**

Name **Signature**

District Medical Officer:_____ **_____**

Name **Signature**

Date report completed:_____/_____/_____

Annex 7C: Template for preparing public health event situation report

Republic of Namibia

Ministry of Health and Social Services

Sample district outbreak report

Distric_____Epidemiological Week_____Week ending (date)_____/_____/_____

I. Epidemiological Situation: Week (insert week number and date here)_____ _____/_____/_____

Table 1: Epidemiological Situation: Week_____

Disease	Cases	Deaths	Fatality (%)	Districts in Alert	Districts in Epidemic	Reported week	Timeliness (%)	Completeness (%)
D1								
D2								
Dn...								
Total								
Comments: Contact us:								

II. Synthesis of the Epidemiological Situation (insert the weeks being reported on here)

Table 2: Epidemiological Situation: Weeks____

Disease	Cases	Deaths	Fatality (%)	Districts in Alert	Districts in Epidemic	Reported week	Timeliness (%)	Completeness (%)
D1								
D2								
Dn...								
Total								
Comments:								

III. Graphs (This section provides a graphical representation of data)

IV. Epidemic Trends

Annex 7D: Outbreak iInvestigation report example

INVESTIGATION OF ANTHRAX OUTBREAK IN KILIMANJARO REGION, TANZANIA

December 2015- January 2016

1. INTRODUCTION

Anthrax is an acute illness caused by *Bacillus anthracis*, a gram positive, encapsulated, spore forming and none motile bacteria. The disease commonly affects wild and domestic herbivores, with human and carnivores as incidental hosts. Three occurrence forms of the disease in humans includes cutaneous, inhalation, and gastrointestinal anthrax. The transmission of the disease can be through intestine (ingestion), respiratory (inhalation), and skin (cutaneous), from infected animal tissues and from infected persons.

The worldwide estimate of the disease burden is not well known, however occasional epidemics do occur (WHO 2005).

An outbreak of anthrax in Marangu, Moshi DC in the Kilimanjaro Region was reported to the Ministry of Health and Social Welfare (MOHSW) by the Kilimanjaro Regional Medical Officer. Therefore, there was a need to carry out an investigation to ascertain what was happening in the affected district.

Objectives of the outbreak investigation

The objectives of the investigation were:

- To confirm and determine the magnitude of the outbreak by actively searching for cases;
- To characterize the outbreak in terms of time, place and persons;
- To identify the source of infection, through collection of both animal and clinical samples;
- To generate and test the hypotheses of the outbreaks; and
- To come up with recommendations, and assist the district teams to respond to, and control the outbreak.

Hypothesis for the Anthrax outbreak at Moshi Rural District

- Slaughtering of a dead cow with possible anthrax as a cause of death, is associated with contracting a disease in humans.
- Handling/eating meat from a dead cow with possible anthrax as a cause of death, is associated with contracting a disease in humans.

2. METHODOLOGY

This was a cross-sectional study that involved the patients presenting with signs and symptoms for anthrax, who were either admitted or at home. An active case search was conducted in the community to identify the cases. Clinical samples were collected, and transported to the laboratory for confirmation.

a) Study area: The suspected anthrax outbreak occurred in Rauya Village in Marangu Mashariki Ward and Mae Juu Village in Siha District, both the districts are located in Kilimanjaro Region in Tanzania.

Places visited

We identified the homes of the cases that sought treatment from Marangu Health facility and Siha Health facility, through assistance of the Kilimanjaro Regional Health Officer, District Health Officers (Moshi DC and Siha), District Veterinary Officers (Siha and Moshi DC) and community leaders. We visited the two most affected villages i.e., Mae Juu and Rauya.

b) Study period: The outbreak investigation was carried out from 8- 14, January 2015.

c) Case definition used:

Case definition - The standard case definitions used to identify the cases were:

Suspected Anthrax case	**IF THERE IS an Anthrax EPIDEMIC:** any resident of Marangu presenting with a clinical illness, in a person who is epidemiologically linked to a confirmed or suspected animal case, or contaminated animal product from 12th December 2015.
Probable Anthrax case definition	Any resident of Marangu presenting with cutaneous ulcers, developing within two weeks of coming into contact with a sick or dead animal, confirmed to have Anthrax, or dying of unknown diseases since 12th December 2015.
Confirmed Anthrax case definition	A suspected case or a probable case where laboratory testing confirms *Bacillus anthracis*, by Gram Staining, culture or PCR.

d. Data collection methods:
Semi-structured questionnaires were used to get information from patients and their families. Where the patient was not available or could not speak, a knowledgeable proxy was used.

3. FINDINGS

Rauya Village, Moshi DC, Kilimanjaro Region

The index case reported at the Rauya RC Dispensary on 6/12/2015. The index case (Erasto Kingstone) was a male aged 39, living in Rauya Village, in Marangu Mashariki Ward. The index case is the son of the owner of the dead cow. The family had one cow and one goat. This outbreak is said to have occurred after the slaughtering of the dead cow. It was noted that the cow died on 3/12/2015, and the family did not notify the veterinary officer for inspection. The cow was slaughtered at home by Erasto, with the help of a neighbour called Elibariki, who also distributed the meat to the relatives and neighbours. The cow skin was given to the dogs. On the second day, 4/12/2015, the index case was slaughtering the head part of the dead cow, and accidentally pricked one of his fingers with the cow bones. On 6/12/2015, the index case had a swollen finger (the pricked finger). On 7/12/2015, the goat also died, and was slaughtered by the index case. The goat meat was eaten only by the family members. On 8/12/2015, the index case realised that the hand that was pricked, was swollen and he was rushed to Marangu RC Hospital. the officer in charge of the hospital suspected the patient had Anthrax, and he administered Amoxilin and painkillers to the patient, for five days. After a few days without any recovery, on 12/12/2015 he went back to the hospital, presenting with swelling on the right upper limb and chest, massive of the RUL and chest, and with eschar on the wound. The hospital in charge referred him to Marangu Lutheran Hospital, where he was also refereed to KCMC Hospital.

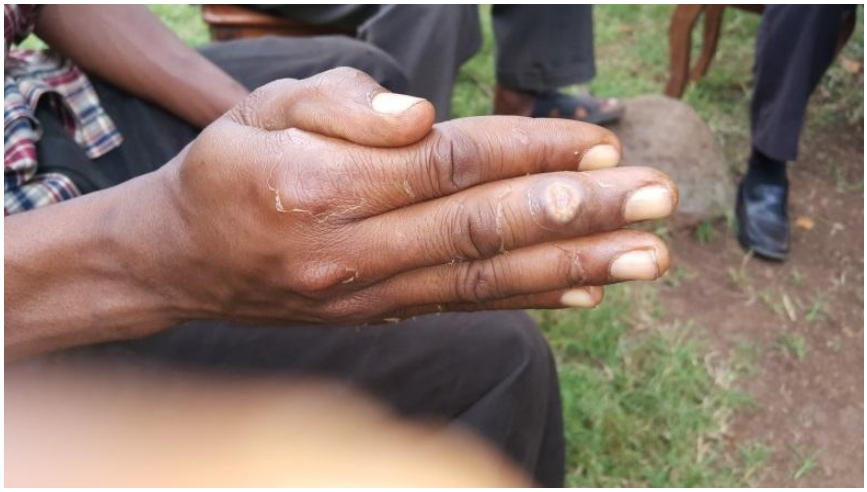


Photo 1: A lesion in the hand of the index case identified in Rauya Village, Moshi, Kilimanjaro Region

Mae Juu Village, Siha District, Kilimanjaro Region

The first case in Siha District was reported on 17/12/2015, a male, 25 years of age who lives in Mae Juu Village in Siha District. This case was brought to the Siha Health facility while unconscious and with blisters and lesionson his arms. This case was involved in selling the meat of the cow, that was slaughtered after death. The community was notified of the presence of an Anthrax outbreak on 22/12/2015. They were also informed that for those who might have had contact with, or had eaten the infected meat, they should go to the hospital. From 23/12/2015 to 28/12/2015, a total of 760 people presented to the hospital, and they were all treated with either Doxyclyine (7days), or Amoxilin (5 days). In Siha District the deaths of four cows were identified, and the team was able to trace three of them that had been slaughtered, and the meat sold at one of the local butcheries. It was also found that the meat was not inspected by the Veterinary Officer. Acow was inspected in another household, but we found that the person who did the inspection was not a Vet Officer, but an artificial inseminator, and he had no knowledge on how to inspect the cattle correctly.

A total of 904 contacts that were linked to the infected meat were obtained, (68 were linked to the dead cow in Rauya Village, Moshi DC), and a total of 836 contacts were obtained in Siha District. Among a the 904 contacts, 23 subjects met the standard case definition, and there were no deaths reported The median age for the cases was 36 years, with the youngest being a 1-year-old, and the oldest was 98 years old. The age group 10-19 years constituted 29.1% of the cases. Other social demographic characteristics for the contacts and cases are as shown in Tables 1 and 2 below.

Table 1: General characteristics of the study subject of Anthrax outbreak in Kilimanjaro Region

Variable	Number	Percentage	95% CI
Gender			
Male	427	47.2	44.0, 50.6
Female	477	52.8	49.4, 56.0
Occupation			
Peasant	128	14.1	11.9, 16.5
Formal employment	138	15.3	13.0, 17.8
Unemployed	85	9.4	7.6, 11.6
Student	314	34.8	31.7, 38.0
Cattle keeper	113	12.5	10.5, 14.9
Others	126	14.0	11.8, 16.4
Educational level			
Non educated	91	10	8.1, 12.2
Primary education	480	53.2	49.8, 56.4
Secondary education	237	26.2	23.4, 29.3
Tertiary education	96	10.6	8.7, 12.9
Age group			
0 to 9 Years	157	17.5	15.1, 20.2
10 to 19 Years	233	26.1	23.2, 29.1
20 to 29 Years	108	12.1	10.1, 14.4
30 to 39 Years	80	9.0	7.2, 11.1
40 to 49 Years	111	12.4	10.4, 14.8
50 to 59 Years	83	9.3	7.5, 11.4
60 and above	122	13.6	11.5, 16.1
Place of residence			
Mae Juu Village, Siha District	836	92.5	90.5, 94.1
Rauya Village, Moshi DC	68	7.5	5.9, 9.5

Others included those who were not available physically for the interview, and children under 5 years.

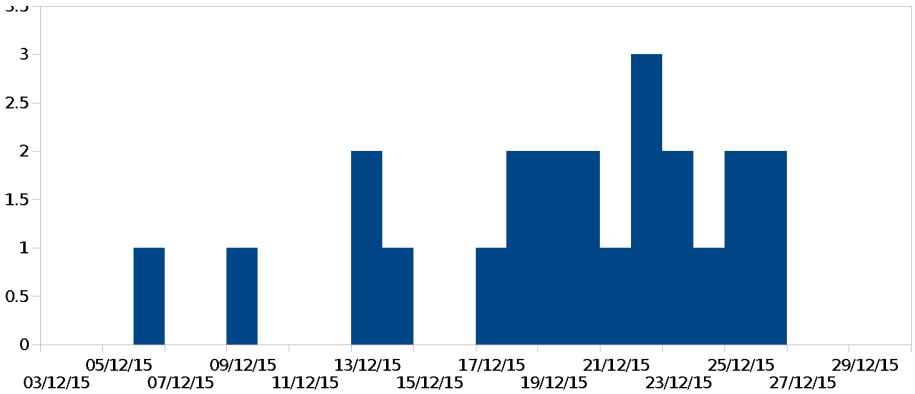
Table 2: Social demographic distribution of cases for Anthrax in Kilimanjaro Region, January 2016

Variable	Number	Percentage	95% CI
Gender			
Male	13	60.9	34.0, 90.6
Female	8	39.1	9.9, 65.1
Occupation			
Peasant	4	17.4	1.9, 36.5
Un employed	6	26	7.6, 41.6
Student	5	21.7	6.7, 48.0
Cattle keeper	8	34.9	10.5, 54.9
Educational level			
Non educated	2	8.7	1.1, 22.2
Primary education	11	47.9	29.8, 66.4
Secondary education	4	17.4	3.4, 39.3
Tertiary education	6	26.1	8.7, 42.9
Age group			
0 to 9 Years	2	8.7	2.1, 20.2
10 to 19 Years	5	21.7	6.2, 49.1
20 to 29 Years	6	26.1	10.1, 44.4
50 to 59 Years	4	26.1	7.5, 41.4
60 and above	6	17.4	3.5, 36.1
Place of residence			
Mae Juu Village, Siha District	19	82.6	65.5, 99.1
Rauya Village, Moshi DC	4	17.4	1.9, 39.5

Table 3: Case classification, Anthrax outbreak, Kilimanjaro Region, January 2016

Cases classification	Number	Percentage
Suspected	10	43.5
Probable	11	47.8
Confirmed	2	8.7

Figure 1: Epidemic curve, Anthrax outbreak, Kilimanjaro Region, January 2016



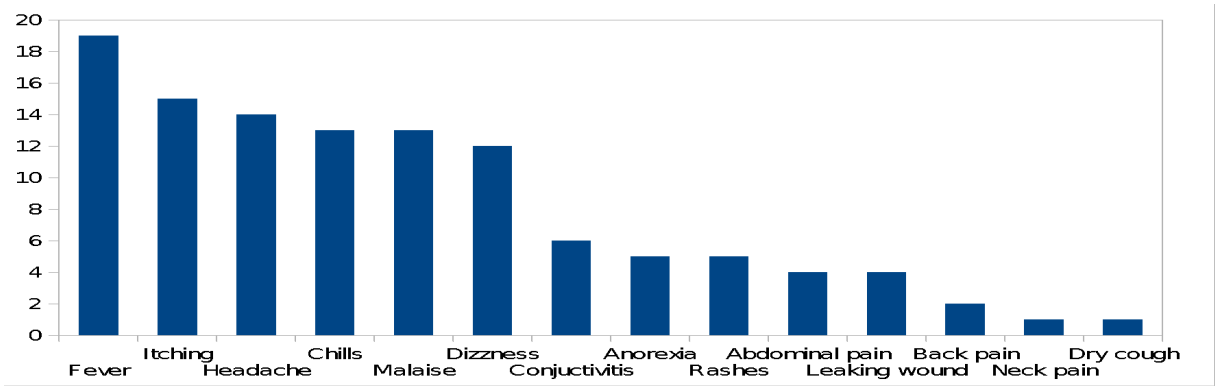
The epidemic curve shows that the first cow died in Rauya Village on 3/12/2015, and the first human case that was involved in slaughtering the dead cow developed symptoms on 6/12/2015. The peak of the outbreak was on 22/12/2015. The last case was reported on 28/12/2015. Of all the potential exposures indicated in Table 4 below, slaughtering, and meat handling were significantly associated with an increased risk of acquiring the disease.

Table 4: Potential risk exposure for acquiring Anthrax disease in Kilimanjaro Region, January 2016

	Prevalence Odds Ratio	95% CI	P value
Involved in slaughtering the cow	5	1.2, 23.5	0.01
Involved in handling the meat	3.2	0.9, 11.3	0.02
Contact with a dead cow, goat (burial)	2	0.7, 10.5	0.2
Eating the meat	7.6	2.2, 18.9	0.07
Contact with other animal products (skin, milk)	1.7	0.3,15.6	0.6

Disease characterization

The period from the exposure of the dead cow, to the onset of symptoms, ranged from 2 to 15 days with the mean of 7.6 days. Among the 23 patients of Anthrax, 3 (13%) were hospitalized. Infectivity rate was 23/904 (2.5%). The most presenting symptom was fever, as shown in Figure 2 below.



Other findings:

- The national team worked hand in hand with veterinary officers, who claimed that there were a lot of cattle that were not vaccinated, and therefore the vaccination coverage is quite low. Only a few cows within the village were presented for the vaccination. The community mentioned that they were not able to afford the vaccination fee of 2000 Tanzanian Shillings per one cow, an 1000 Tanzanian Shillings per one goat.
- The community was not well informed about Anthrax, and how to handle the sick and dying animals.

4. MEASURES TAKEN

- Quarantine of meat and meat products was imposed in the affected areas;
- Vaccination of cows against Anthrax, and will focus in the affected wards;
- Provision of education to the community through village meetings, churches, mosques, and schools. Community leaders were present to address the people.
- All the cases that presented to the hospital with cutaneous lesions were treated, and prophylaxis was given to all the identified contacts (prophylaxis of Doxycline (7 days), and some were given Amoxilin (5 days);

- The DVO, DHO and the Ministry of Health and Social Welfare officers conducted a joint meeting and came up with different interventions; and
- Disinfection of the cow sheds and slaughtering sites was done using lime stone powder.

5. CHALLENGES

- Vaccination coverage was quite low, and few cows within the villages were presented for vaccination. This was a result of the shortage of vaccines.
- The community was not well informed about Anthrax and how to handle the dying animals.
- A close link between the RMO/DMO and the DVO is lacking, until zoonotic outbreaks occur.

6. RECOMMENDATIONS

- The veterinary sector should intensify its vaccination program by increasing the coverage, and providing regular and timely vaccines to livestock, especially against zoonotic diseases which are prone to epidemics.
- The community should be well informed about Anthrax and other zoonotics, and how to handle the dying animals.
- There should be a close link between the RMO/DMO and the DVO in dealing with zoonotic cases. This will ensure a One Health approach.
- Preliminary tests for diagnosis in animals should be done first, as this will give a clue of what we are dealing with.

7. CONCLUSION

The outbreak of Anthrax in Kilimanjaro Region was established through laboratory confirmation, with a link between the human case and the dead cattle. All of the cases were linked to the dead cows, making that a cause for the outbreak. Slaughtering and handling of the meat of the dead cows were the major risk factors for acquiring the disease in humans. The outbreak was declared over on 14 January 2016.

Annex 7 E: IHR Core capacity for monitoring risk communication

	IHR Core Capacity Monitoring Questionnaire: Risk Communication
1	Have risk communication partners and stakeholders been identified?
2	Has a risk communication planA been developed?
3	Has the risk communication 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?
6	Are there accessible and relevant IEC (Information, Education and Communications) materials tailored to the needs of the populationD?
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 communications efforts during a public health emergency been shared with the global community?

Notes:

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 7 F: List of Stakeholders and partners for risk communication

Ministry of Health and Social Services (MoHSS)

Ministry of Education, Arts and Culture (MoEAC)

Ministry of Agriculture, Water and Land Reform (MAWLR)

Ministry of Urban and Rural Development (MURD)

Minister of Information and Communications Technology (MICT)

Ministry of Works and Transport (MWT)

Ministry of Environment, Forestry and Tourism (MEFT)

Namibia Civil Aviation Authority (NCAA)

Office of the Prime Minister – National Disaster Risk Management Committee

Ministry Mines and Energy (MME)

Ministry of Labour, Industrial Relations and Employment Creation (MLIREC)

Ministry of Home Affairs, Immigration, Safety and Security (MHAISS)

Institutions of Higher Education

National Public Health Institutes

Namibia Commission on Research, Science and Technology

Public Health Facilities

Private Health Facilities

Laboratories

Local Authorities

Namibia Medicine Regulatory Council

United Nations Agencies: WHO/ UNICEF, UNAIDS

Africa Centres for Disease Prevention and control (Africa CDC)

US Centres for Diseases Prevention and Control (US-CDC)

Namibia Red Cross Society (NRCS)

Non-Governmental Organizations (NGOs)

Faith-based Organizations (FBOs)

Medical Associations

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3. The United Republic of Tanzania, National Communication Guidelines for Public Health risks and emergencies, 2016
4. World Health Organization Outbreak Communication Planning Guide, 2008 Edition
5. Tanzania Field Epidemiology and Laboratory Training Program (Residents Outbreak reports)
6. Communication for behavioural impact (COMBI)
7. http://www.who.int/IHR/publications/combi_toolkit_outbreaks/en/
8. Effective Media Communication during Public Health Emergencies
9. http://www.who.int/CSR/resources/publications/WHO_CDS_2005_31/en/
10. Outbreak Communication. Best practices for communicating with the public during an outbreak
11. http://www.who.int/CSR/resources/publications/WHO_CDS_2005_32/en/
12. WHO Outbreak Communication Planning Guide
13. http://www.who.int/IHR/publications/outbreak-communication-guide/en/

SECTION 8

MONITOR, SUPERVISE, EVALUATE AND PROVIDE FEEDBACK TO IMPROVE SURVEILLANCE AND RESPONSE

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8. 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, reports are received on time), while evaluation, which is done periodically (for example annually), assesses whether surveillance and response objectives have been achieved. Monitoring and evaluation help to understand and measure whether the system has been working effectively. By evaluating information regularly, for example, at the end of a year, supervisors can decide if surveillance and response objectives have been achieved, and if they are of high quality. Through support supervision, supervisors and healthcare workers work together to review progress, identify challenges, and their causes, and develop feasible solutions. Sustainable support supervision and feedback has been shown to contribute to improved performance of national diseases surveillance systems.

This section will describe how to routinely monitor and annually evaluate the performance of the surveillance system, and the control and prevention programs for specific disease, or public health events. It focuses on the core surveillance functions described in the introduction section. This section also describes how supervision, and provision of feedback are key for the improvement of the surveillance and response systems.

Some of the benefits of routine monitoring of the IDSR system include:

- Track implementation of the planned activities, and ensure that planned targets are achieved in a timely manner;
- Track the progress of improvements in the targeted indicators, and the quality and attributes of the system, e.g., timeliness of reporting, completeness of reporting etc.;
- Identify problems in the system, in order to institute corrective measures in a timely manner;
- Ensure that all implementers of the systems are held responsible and accountable for their defined roles and activities; and
- Ensure that other stakeholders can receive information on the performance of the surveillance system.

Some of the benefits of evaluation include:

- to ensure that the surveillance system meets the objectives for which it was formulated;
- to document the status of, and any change in the performance of the system;
- to provide evidence for which surveillance objectives, implementation strategy and planned activities can be modified;
- to enable planning of resource allocation;
- to provide explanations for achievements and failures in the system; and
- to provide specific recommendations, with timelines for improving the system.

Some of the benefits of providing feedback after supervision include:

- to reinforce the efforts of healthcare workers to participate in the surveillance system;
- to provide motivation for those who sent the data and hence increase compliance for reporting;
- to increase the quality of data from those who collect the data;
- to enhance the planned public health action;
- to compliment planning for appropriate actions;
- to strengthen communication and teamwork; and
- to enhance data ownership and utilization.

Section 3 of these guidelines describes how, the healthcare worker responsible for surveillance at the health facility, and at the district level, reviews and analyses the data reported during the month.

Conclusions are made about:

- The timeliness and completeness of reporting from each level, and
- The quality of existing routine prevention and control activities , so that when problems are detected, districts can respond with the appropriate action.

The same information can also be used during supervisions to routinely monitor, and annually evaluate:

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

When problems are detected in the surveillance and response system, action can be taken to strengthen the system. By giving feedback to health workers for the corrections which have been identified and which need to be addressed, it is more likely that results will show the desired outcomes. For example, use the monthly monitoring data to do an evaluation at the end of the year.

Questions to help evaluate include:

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

8.1 Identify targets and indicators

Using indicators can be 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 its way to achieving its objectives and goal. This achievement is then compared to overall recommended performance standards. Some disease-specific surveillance indicators also exist, and can be used to monitor the quality of the surveillance system, e.g., AFP and measles.

Indicators are also used to assess the performance of the surveillance system, and whether it is reaching its targets and objectives. For example, a district may have set the 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 to the desired goal or target, and can be used to evaluate progress and, therefore, the quality of the 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 in a district. Select the indicators that are most relevant to the district's plan for improving surveillance this year, and which will provide information that the district can use.

8.1.2 Select data for measuring the indicators

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

Indicator: The proportion of health facilities in the district that keep trendlines for priority diseases.
Numerator: The number of health facilities that keep trendlines for priority diseases.
Denominator: The total number of health facilities in the district.
Ensure sources of data are available.
Each level should make sure that the level it supervises has the following sources of data available as shown in Table 8.1 on page 330. For example, the national level has data available from the district and region levels to conduct the required monitoring activities.

Table 8.1: Types of sources of data at various levels

Data source	Health Facility	District	Regional	National
Monitoring chart for tracking indicators (Sample charts are in Annex 8A)	X	X	X	X
Outpatient register	X			
In-patient register	X			
Health facility reporting forms e.g. CIF	X			
Case-based and/or line listing reporting forms	X	X	X	X
Outbreak investigation report	X	X	X	X
Log of suspected outbreaks and rumours	X	X	X	X
Supervisory reports from district and/or region		X	X	X
Laboratory reports received	X	X	X	X
IDSR weekly reports		X	X	X
DHIS2 database	X	X	X	X

8.2 Monitor the core functions for IDSR at district level

The indicators related to the core functions measure the processes and outputs from the surveillance system. In the introduction section, core surveillance functions were described and you can refer to the table of core surveillance functions for each level. This sub-section will describe the key indicators at various levels with regard to the core functions. The core functions are briefly described here, and there are indicators for each core function.

See Annexes 8A to 8D for detailed descriptions of the core functions.

The core functions are:

(i) Identify cases and public health events

- Case detection is the process of identifying cases and outbreaks. Case detection can be through the formal health system, private health systems or community structures. Case definitions and a functioning rumour verification system are vital for case and outbreak detection. Once a case has been identified, there is a register (Outpatient or In-patient register, clinical cases register etc.) where these cases have to be recorded. In many countries, health workers use these registers to extract the IDSR priority diseases.
- Monitoring indicators should be established to monitor this core surveillance function. Examples of indicators could be:
- Proportion of health facilities that have standardized 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 the recordings.
- Proportion of health facilities using Standard Case Definitions (SCD) to identify IDSR priority diseases of cases.

(ii) Report Cases and Events

- Reporting refers to the process by which surveillance data moves through the surveillance system, from the point of generation to the next level.
- It also refers to the process of reporting suspected and confirmed outbreaks, as well as notifying under the IHR 2005 of PHEIC, using the decision instrument described in Section 2.
- Different reporting systems may be in existence depending on the type of data and information being reported, the purpose and urgency of relaying the information, and where the data/information is being reported.
- 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 the national guidelines.
- Examples of indicators for this core surveillance function include:
- Proportion of complete surveillance reports submitted on time to the district.
- Proportion of cases of diseases targeted for elimination, eradication, and any other disease selected for case-based surveillance, reported with case-based forms or line lists.

(iii) Data analysis and interpretation

Data analysis is the systematic process of examining data to generate relevant information, for timely and appropriate public health action to be taken.

Surveillance data should be analysed routinely, and the information interpreted for use in public health actions.
Capacity for routine data analysis and interpretation should be established and maintained for epidemiological as well as laboratory data.

- 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 districts that report laboratory data for diseases under surveillance.

(iv) Investigation and confirmation of suspected cases/outbreaks

- Case/outbreak confirmation depends on the epidemiological and laboratory capacity for confirmation.
- Capacity for case confirmation is enhanced through improved referral systems, networking and partnerships. This means having the capacity for appropriate specimen collection, packaging and transportation.
- The existence of internal and external quality control mechanisms are important elements for case confirmation, in helping to ensure the validity and reliability of test results.
- Examples of indicators for monitoring this core functions include:
- Proportion of suspected outbreaks of epidemic-prone disease notified to the district level within 24 hours of crossing the epidemic threshold.
- Proportion of investigated outbreaks with laboratory results.

(v) Preparedness

Epidemic preparedness refers to the existing level of preparedness for potential epidemics, and includes the availability of preparedness plans, stockpiling, designation of isolation facilities, and setting aside of resources for outbreak response

Examples of indicators which can be used to monitor preparedness include:

- Proportion of health facilities with stock of key items that are important for the response (e.g., PPE, specimen collection kits, case-investigation forms, I.V fluids, and treatment kits etc.).
- Proportion of districts with emergency preparedness and response plans.

(vi) Response

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 the public health response and control.

Some examples of indicators for monitoring response include:

- Proportion of districts with a functional multi-sectoral District Health Emergency Management Committee (DHEMC).
- Proportion of districts with a functional Public Health Emergency Rapid Response Team (PHERRT).
- Case fatality rate for the epidemic-prone disease reported.

(v) Feedback

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. Item 8.5.2 of this section, describes the types of feedback which can be used to improve performance of IDSR.

Some examples of indicators for feedback include:

- Proportion of districts producing regular epidemiological bulletins.
- Proportion of feedback bulletins/reports received from national levels (if you are evaluating feedback from national to subnational levels).
- Proportion of health facilities with at least one IDSR technical support supervision visit in the previous quarter.

NOTE: **While all indicators for the IDSR core functions are important, MoHSS will measure the overall performance of the core functions of IDSR in the districts, by using the 14 key performance indicators described in Annex 8J.**

8.3 Monitor the quality of IDSR activities at district level

The quality of the surveillance system is defined by attributes such as:

i. completeness,
ii. timeliness,
iii. usefulness,
iv. sensitivity,
v. positive predictive value (PPV),
vi. specificity,
vii. representativeness,
viii. simplicity,
ix. flexibility,
x. acceptability,
xi. reliability, and
xii. consistency.

Periodically the quality of the surveillance system should be assessed on these indicators.

Surveillance attributes can be evaluated using quantitative and qualitative methods. The updated Morbidity Mortality Weekly Report (MMWR), updated guidelines for evaluating public health surveillance systems produced by the CDC, and the framework for evaluating public health surveillance systems for early detection of outbreaks, are some of the tools which can be used to comprehensively evaluate surveillance systems (CDC, 2001). Namibia has a Field Epidemiology Training Programs (FETP) Register and is using FETP residents to assist in the evaluation of the IDSR and other disease surveillance systems.

8.3.1 Monitoring the timeliness and completeness of monthly reporting

An important indicator of a quality reporting system is the timeliness and completeness of reporting at each level. When reports are sent and received on time, the possibility of detecting a problem, and conducting a prompt and effective response is greater. If reports are incomplete, the information cannot adequately describe the problem. If reports are late, or are not submitted, the aggregated information for the district (or other administrative area) will not be accurate. Outbreaks can go undetected, and other opportunities to respond to public health problems will have been missed.

8.3.1.1 Timeliness

The single most important measure of timeliness is whether data is submitted in time, to begin investigations and implement control measures. Timeliness of reporting should be measured against the standards developed by MOHSS in accordance with the set timelines.

Important aspects of timelines oin the reporting of a communicable disease surveillance system include:

- timeliness of immediate notification, i.e. within 24 hours;
- timeliness of weekly reporting; and
- timeliness of monthly reporting.

(i) Monitor detection of immediately-notifiable 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 the outbreak.

Other intervals to monitor for detection of immediately-notifiable diseases include:

- monitoring reporting from the community to the health facility (within 24 hours of onset of illness),
- from the health facility to the district (within 24 hours),
- from the district to all levels (within 24 hours), and
- from the time the threshold is reached, to a concrete response (within 72 hours).

(ii) Timeliness of weekly and monthly reporting

If you routinely record and review the dates on which reports are received, the effectiveness of the system can be assessed easily each month, during the analysis of routine and case-based data.

See Annex 8G at the end of this section, for an example of a monitoring tool which can be used to monitor timeliness in your district.

For example, use the record of reports received to:

- Measure how many reporting sites submitted reports for a given week/ month, against the number of sites expected to report.
- 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:

(i) Completeness of reporting sites submitting surveillance forms:

Completeness of reporting sites refers to the proportion of reporting sites that submitted the surveillance report, irrespective of the time when the report was submitted.

Computing completeness of reporting sites for each of the surveillance reports can:

- 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.
- trigger further investigation into reasons for poor performances, and possibly help to identify solutions to correct poor performance.

(ii) 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 the reportable conditions reported to the next higher level over a period, with the number of cases recorded in the patient register over the same period.

(iii) 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 for public health actions:

- Has all of the data, on each of the required variables in a surveillance form been correctly collected, registered, validated and compiled?
- If not, which variables are not routinely collected, and what is hindering their collection?
- What is the implication of the missing data on the quality of the surveillance data?
- How can this problem be resolved?

8.3.1.3 Identify problems and take action

If the monitoring information shows that a health facility or other reporting unit has not provided a report, or if the report is not on time, contact the surveillance focal person at the facility. Work with the designated staff to identify what has caused the problem, and develop solutions together (e.g., find out if a reliable supply of forms, or other reporting methods such as cell phone text messaging, or telephone are available). Explain the benefits of collecting good quality data, and reporting it in a timely manner to the facility staff. For example, explain that this can help them to detect outbreaks, improve medicines and supplies forecasting, and improve overall health facility management.

Additionally, ask if a new staff person has started at the facility and is yet to receive orientation on the procedure for reporting, or find out if health facility staff receives feedback about case reports they have generated, and that there are resources available to take action as a result of this information.

Make plans with the reporting unit to find solutions for improving the situation. Explain that, when information is complete, the district can assist health staff more efficiently with planning responses and carrying them out. For example, if lack of supplies is a problem, the district can use the reporting information to advocate with higher levels in the system.

8.3.1.4 Report timeliness and completeness to other levels

When routine reports or line-listed records of the number of cases are sent to the regional or national level, also send the necessary data for timeliness and completeness. This will help the other levels to understand the situation more clearly, and to evaluate the quality of the data that is being sent. For example, if the report to the national level states that two cases of measles were detected during the month, it should also include information about the number of health facilities that 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 Monitoring other attributes for assessing the quality of the IDSR system

Some other key important attributes are summarized in Table 8.2 below, and can be used to assess the quality of the surveillance system. These attributes should be used to assess the quality of surveillance systems during periodic evaluation assessments. Refer to the updated framework for evaluating surveillance systems contained in the table, for a complete list of attributes.

Table 8.2: Summary of other attributes for assessing quality of surveillance system

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 the performance measures. e.g., Usefulness of surveillance data in an early warning system	Is the system e.g., is the early warning system able to detect outbreaks early? Example: A useful system over time must demonstrate that a certain intervention which has been instituted, and has worked. In a malaria program, data collected over time might show whether insecticide-treated bed nets (ITN) have been useful in reducing incidences of malaria among children under five.
Simplicity	Simplicity refers to the structure of the system, and the ease of implementation from the end user to those at higher levels.	Is the system easy to use? e.g., is the SCD clear and simple? Does it have multiple reporting structures? e.g., a health worker has to report to the district as well as to another vertical program, if a disease is under that program.
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 the data generated through the system.	What is the participation rate of surveillance sites? How complete are the reports? e.g., number of health facilities submitting reports on time.
Representativeness	Representativeness refers to the degree to which the reported cases reflect the occurrence and distribution of all the 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 of the population, even those who are marginalized.
Data quality	Data quality reflects the completeness and validity of the data recorded in the public health surveillance system.	Data quality reflects the completeness and validity of the 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: The validity depends on the quality of data. Error-prone systems and data prone to inaccurate measurement can negatively affect detection of unusual trends.

For further information on additional attributes, 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 the quality of surveillance activities at community level

8.4.1 Monitoring events from community-based surveillance

Monitoring CBS systems is equally as important as monitoring health facilities, districts and regions. CHWs, community focal persons, and volunteers involved in the system must understand the benefit of the system, that their input is valued, and can assist in improvement or adaptation of the system to work better for the community.

Qualitative feedback from volunteers and the community is an essential part of contextualizing 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:

- Open and regular community meetings where all issues are noted and acted upon;
- Focus group discussions with volunteers and/or community leaders;
- Suggestions and complaints box(es) for use in the community;
- Appointment of a community representative(s) to gather feedback and complaints; and
- Feedback platforms on mobile phones can be used by the community volunteers to give feedback.

There should also be community-driven data analysis and monitoring, whereby the community are supported to undertake their own data analysis. Communities can be provided with the basic material needed to record the type of occurrences they report and the resulting actions, as well as recording outbreaks or events that occurred but did not trigger an alert, so that triggers can be adjusted. Table 8.3 below, lists some performance indicators for community-based surveillance.

Table 8.3: 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 24hrs/48hrs.	**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 visits 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 24hrs/48hrs 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.

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 rather than finding things that are wrong.

In a good supportive supervision system, supervisors and healthcare workers work together to review progress, identify challenges and what has caused them, and to 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 the job descriptions and SOPs of health staff who have a role in the surveillance and response system. Make sure that the job description states:

- The surveillance tasks to be performed;
- To whom the staff person reports; and
- A defined scope of work; and
- Which SOPs have to be adhered to in practice.

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

- Decide how often to monitor the perfomance of healthcare workers. For example, a district may decide to conduct a support supervisory visit at least 4 times a year for each health facility. In some countries, depending on resources, supervisory visits take place more often (monthly, for example).
- Ask health facility supervisors to make a schedule of the supervision they will conduct over the next year in their own facilities, and to any community sites that report to the facility.
- Ensure availability of the checklist for use during support supervisory visit.
- Make sure that transport is available for supervision and for surveillance activities that require transportation. e.g., coordinate travel or logistics for surveillance supervisory visits, with visits made by other programs or activities.
- Include other reporting sites in supervision of district surveillance activities such as private health centres, other clinics (schools, uniformed forces), medical centres, and community reporting sites in the overall plan.

c. **Use a supervisory checklist**
Each health facility has unique challenges and priorities that require specific problem solving and corrections. To maintain the positive motivation of the health facility staff for making improvements, consider developing a checklist to guide the supervisory visit. The items listed in a checklist are some of the examples of achievements that a health facility can be evaluated on.

See Annex 8H at the end of this section.

Always refer to, and look for, additional examples to evaluate for each core surveillance function at the health facility level.

See Annexes 8A to D at the end of this section.

For example, when the facility has achieved one objective (e.g., using SCDs consistently), work with the 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 to monitor their activities and progress towards an improved system.

During the visit, use a checklist to monitor how well health staff are carrying out the recommended surveillance functions. For example, a district surveillance officer visiting a health facility for a supervisory visit should verify the following:

Identify and register cases	Check the health facility register to see if the case diagnoses correspond to the recommended SCD.
	Check the register to see if all the columns are filled out correctly.
Confirm cases	Compare the laboratory records for priority diseases with the number of cases seen in the clinic for the same period of time. For example, compare the number of positive malaria slides with the reported number of hospitalized malaria cases.
Reporting	Ask to see copies of the most recent reports for the most recent reporting period. Compare the number of cases of priority diseases that were reported with the number recorded in the register. Check the date on which the case report was sent against the date recommended for sending the report. Check the reports to make sure they are complete and accurate.
Review and analyse data	Verify that trend lines are prepared and kept up to date for priority diseases. Ask to see the "Health Facility Analysis Charts", or the electronic health facility data in your district. Look to see if the trendlines for selected diseases are up to date.
Preparedness	Look at the stocks of emergency drugs, supplies and PPE to be sure there is an adequate supply.

NOTE:

See Annex 8H at the end of this section, for a sample supervisory checklist.

See Annexes 8A to 8D at the end of this section, which describe details of core surveillance functions at health facility level, and can be used for guidance in supervision of the health facility.

The questions to be answered during the supervisory visit can be adapted or modified to meet the specific concerns and extent of progress towards an integrated surveillance system within the health facility.

d. Conduct support supervisory visits

Conduct regularly scheduled support supervision at all levels (national to region; region to district; district to health facility; facility to community), to ensure that:

- Appropriate supplies (e.g., forms, job aids), and required SCDs/ guidelines are available.
- Public health staff know how to identify and use SCDs to record suspected cases of priority diseases seen in their health facility.
- Priority diseases are recorded in the case register, according to the case definition.

- Some data is 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).
- Reported cases of diseases, conditions, or events for which a single case is a suspected outbreak or public health emergency, are investigated promptly (e.g., a single confirmed case of Cholera or Polio, maternal death, or MDR/XDR TB).
- Response takes place when outbreaks or other public health events are confirmed, or when problems are identified in routine reporting.
- Response actions are monitored, and action is taken by the health facility to improve surveillance and readiness for outbreak response.

Make sure during the visit to:

- Provide feedback to healthcare workers. Tell them what is working, and what is not working. Also give feedback on how the data reported previously was used to detect outbreaks and take action to reduce illness, mortality and disability in the district. If improvements are needed, discuss solutions with the staff.
- Provide on-the-job training as needed if a problem is identified. For example, during a review of the analysis workbook, the supervisor noted that case fatality rates were not calculated correctly. The supervisor met with the health staff who do the calculations and reviewed the steps for calculating the rate..
- Follow up on any request for assistance, such as for emergency response equipment or supplies.
- If a solution to a pre-existing problem was identified in a previous visit, check to see how well the solution has been implemented. Find out if problems are still occurring, and modify the solution if necessary.
- Ensure that both the supervisor and supervisee sign the supervision reports and also provide dates when the supervision was done.

e. **Write a report of the supervisory visit**
Report achievements and challenges that were identified during the visit. Also state the follow-up actions that were planned with the healthcare workers, and any requests for additional resources, funds or special challenges.

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

8.5.2 Feedback

In most cases, health facilities and districts reliably report surveillance data to the next level as required. When the district or regional or national managers receive data, they should respond to the health facilities that reported it. The purpose of the feedback is to reinforce the efforts of healthcare workers to participate in the surveillance system. In addition, it helps to raise awareness about certain diseases, and any achievements of 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 communication and teamwork. The feedback should be both vertical and horizontal, targeting different audiences as in different levels in the health system.

Effective feedback should be:

- Specific, to ensure tthat he recipient understands the subject of the feedback;
- Based on the report submitted, or the actual events and activities observed in the field; and
- Given as soon as feasible after receiving the report or field visit, so that the recipient will remember the activities that should be either sustained or corrected.

If the facility does not receive information from the next level about how the data was used or what the data meant, healthcare workers may think that their reporting is not important. As a result, future reporting may not be as reliable, because health staff will not know if the information they sent to other levels, was important or necessary. They will have a good understanding of the health situation at their own level, but they will not have the information they need for characterizing the situation at a district or national level. At the community level, communication includes building relationships, and communication and coordination 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 such as publications, or it may be given verbally through a telephone call or periodic meetings. Although this section focuses on district level feedback, this can also be applied iat the health facility and national levels. Feedback may also be given during supportive supervision carried out by districts to health facilities, or region to districts, or national to districts and regions. Supervision visits can focus on the performance of health programs, and feedback can be provided during these visits.

Feedback should also be given periodically for IDSR notifiable diseases, and this can be through weekly, monthly or quarterly epidemiological bulletins. The bulletins provide information on disease patterns and achievement of program objectives in the country. They are usually brief and are important for reaching policy makers, legislators, development partners, program technical staff and stakeholders.

As a minimum, they contain:

- A summary table with the number of reported cases and deaths to date, for each priority disease;
- A commentary or message on a given disease or topic; and
- Any relevant social, economic or cultural information, or data on the context that can lead to the creation of real intelligence regarding an event.

See Annex 8I at the end of this section for an example of an epidemiological bulletin.

a. **Develop information summary sheets**
   An information summary sheet is a report that presents data and its interpretation in a table or other graphic format. For example:

   - At a staff meeting, or during a supervisory visit, give a verbal report or comment about the data that was reported by the health facility during a given period.
   - Display the data in a simple table. Meet with the health staff and show them the data. Discuss the likely conclusions that can be drawn. Consider conclusions not only for the health facility, but also for the district as a whole.
   - Prepare a single sheet with a simple table that shows how the data reported for this period is different from the data reported for some other period or target population. For example, show the number of cases of

diarrhoea with dehydration in children less than 5 years of age from the same period last year. Compare them with the corresponding period this year, after a safe water project was implemented in a high-risk area. Use the summary sheets to support requests made to higher levels for additional funds, supplies and resources.

b. **Develop region/district newsletters**

The purpose of a region/district newsletter is to provide shorter updates than those provided in a more detailed feedback bulletin. The region/district newsletter is useful for informing and motivating healthcare workers. The target audience for a newsletter could be healthcare workers in the district and the District Management Team. The newsletter can be 2 to 4 pages long, and produced simply with a computer or typewritten text.

Examples of articles that could be carried in a newsletter are:

- Summary of national or district data for a given priority disease;
- Report of progress towards a specific public health target;
- Report of a specific achievement towards public health by an individual health worker or a group of health workers; or
- Description of special events or activities (for example, a change in market day).

8.6 Evaluate effectiveness of the performance of IDSR strategy

The purpose of evaluation of a surveillance system is to assess its effectiveness, including the response system, in terms of timeliness, quality of data, preparedness, case management, and overall performance, using the 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.

The evaluation of the surveillance system should:

- Show to what extent the desired outputs and outcomes are achieved;
- Provide explanations for achievements, disparities and failures;
- Document the quality of the system and demonstrate any changes in its performance; and
- Demonstrate the extent to which the overall surveillance objectives have been achieved.

Depending on the development status of surveillance in a district, select indicators for evaluation that will provide information that relates to the district's priorities and objectives for the year.

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. Alternatively, surveillance systems should be evaluated every 2, 3 or 5 years.

Key steps in evaluation include:

8.6.1 Define your objectives

- Objectives should be simple, measurable, attainable, realistic, and time-bound (SMART).

8.6.2 Development of evaluation indicators

- Indicators should be identified for each of the evaluation objectives, and should be harmonized as much as possible with the monitoring indicators.

8.6.3 Development of evaluation methods and tools

- Based on these indicators, an evaluation protocol should be developed describing how the evaluation will be conducted, methods, target group, data sources, data collection methods, and plan for data analysis and utilization.

8.6.4 Identify people to conduct the evaluation

- Determine who the evaluators will be: people within the districts, people outside the district, or a mixture of people, including partners and donors. Depending on the scope of the evaluation, its purpose, and the available resources, a decision should be made during the planning stage on who should undertake them.
- To ensure objectivity and transparency during the evaluation process, a blend of self-internal evaluations and external evaluations should be conducted periodically.

8.6.5 Conduct the evaluation

8.6.5.1 Compile and organize monitoring data and other results

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

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

The regional health team should compile the surveillance data received from all districts in the region, and submit the report to the national level. Submission of the report should not be delayed until the last report is collected. The region should compile and submit the available reports on time. The late reports may be sent separately once they have been received.

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

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

Gather data from several sources.

For example:

- Review the objectives for the year listed in the district's annual plan for improving surveillance and response.
- Gather the monthly summaries of cases and deaths reported to the district, spot maps, and other analysis results performed by the district.
- Collect any results from special surveys or studies that were done in the district over the last year.
- Include case investigation forms and reports of outbreak response activities that took place in the district.
- Gather summary information from the community and also from health staff.

8.6.5.2 Analyse data

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

- Were the reports complete, on time and accurate?
- What were significant changes in disease or event trends during the year? If an increase occurred, was the problem identified?
- If additional cases are still occurring, why are they occurring? Where are they occurring?
- Were appropriate and timely actions taken in response to the surveillance data?
- Were supervisory visits conducted, and follow up tasks carried out as planned?
- Did the community feel that response activities were successful?
- Were any actions taken to address health staff requests, or suggestions about services or surveillance?
- Were appropriate measures taken to prevent similar events?

8.6.6 Identify problems and their causes

If problems occurred, and the district did not meet an expected target, or reach a desired level of performance with any indicator, find out what caused the difference, between what was planned and what actually occurred. If a problem is identified, talk with the district team and health facility staff to find out the possible causes of the problem.

8.6.7 Update plans for improvements to the IDSR system

Include successful activities that should continue in the district plan. Also include any feasible solutions identified as a result of analysis of the year's annual evaluation. Plan to implement the solution. For example:

- State the new activity and its objectives.
- Specify the personnel who will carry out the activity.
- Estimate the cost of the activity (if any).
- Develop a timetable for the activity. Define the sequence of activities in logical order.
- Specify the logistics for the new activity (e.g., equipment, personnel, transportation, and resource allocation).

8.6.8 Provide feedback to health facilities about the evaluation

Provide a report and give feedback to health facilities and others in the district on the results of the evaluation activity. Include in the feedback report:

- What the objectives were for the year.
- What was actually achieved.
- What the likely reasons were for any differences between what was planned, and what was achieved.
- Recommended solutions and prioritized activities for improving surveillance and response in the district.

Annexes to Section 8

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Annex 8A: Indicators for monitoring IDSR core functions at the health facility level

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Identify	Availability of Standard Case Definition (SCD) and IDSR forms/registers	Correctly identifying and filling cases/events	N/A	N/A	• Checklist for the in-charge at the H/F	N/A	Quarterly
	Existence of a mechanism to capture unusual or public health events from non-routine sources	Measure the ability of the system to capture unusual events	N/A	N/A	• Interviews • Health facility register of suspected outbreaks and alerts • Event-based electronic platforms	N/A	Monthly
	Proportion of priority suspected cases identified for immediate referral within 24 hours of being seen	Measure capacity to identify priority diseases for immediate referral	Number of priority suspected cases referred within 24hrs	Total number of priority suspected cases which needed immediate referral referred	• OPD and IPD registers • Line list	100%	Monthly
Reporting	Proportion of complete surveillance reports submitted to the district	The practice of health facilities in submitting complete surveillance reports to the next level	Number of complete surveillance reports submitted to the district	Number of expected complete surveillance reports from the health facility	• Monitoring chart for submission of complete reports	80%	Monthly
	Proportion of surveillance reports submitted on time to the district	The practice of health facilities in submitting timely surveillance reports to the next level	Number of surveillance reports submitted on time to the district	Number of expected surveillance reports from the health facility	• Monitoring chart for timely submission of report	Proportion of complete surveillance reports submitted on time to the district	The practice of health facilities in submitting timely surveillance reports to the next level
	Proportion of cases of diseases targeted for elimination, eradication and any other disease selected for case-based surveillance reported with case investigation forms and line lists	Measures reporting of surveillance data with detailed information to use for further analysis	Number of cases of diseases targeted for eradication, elimination or any other diseases selected for case-based surveillance reported with case investigation forms and line list	Total number of cases of diseases selected for case-based surveillance that occurred in the health facility	• Routine summary reports and case-based or line listing reports	80%	Monthly

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Analysis and Inter pretation	Proportion of priority diseases for which a current line graph is available	Measures the practice and capacity to analyse surveillance data	Number of priority diseases for which a current line graph is available	Total number of priority diseases	• The activity checklist for the "in charge" at the health facility and the IDSR summary reporting forms from the health facility	80%	Quarterly
	Proportion of priority diseases for which an updated spot map is available	Measures the practice and capacity to analyse surveillance data	Number of priority diseases for which an updated spot map is available	Total number of priority diseases	• The activity checklist for the "in charge" at the health facility and the IDSR summary reporting forms from the health facility	80%	Quarterly
	Proportion of priority diseases for which there is current lab data analysis (if a health facility has a laboratory)	Evidence of routine laboratory data analysis and interpretation	Number of priority diseases for which a current lab data analysis is available	Total number of priority diseases	• Laboratory register	80%	Quarterly
Investigation and confirmation of suspected outbreaks	Proportion of suspected outbreaks of epidemic prone disease and other PHE notified to the district level within 24 hours of surpassing the epidemic threshold	Measures early detection and timely reporting of outbreaks	Number of suspected outbreaks of epidemic prone diseases notified to the district within 24 hours of surpassing the alert threshold	Total number of suspected outbreaks of epidemic- prone diseases in the health facility	• Health facility register of suspected outbreaks and alerts	80%	Yearly
	Proportion of specimens from suspected cases within 24 hours of collection**	Measure capacity to collect samples in a timely manner	Number of suspected cases for which samples were sent within 24hrs	Total number of suspected cases	• Laboratory register	80%	Yearly
	Proportion of samples of suspect cases whose lab test results are returned within acceptable turn-around-time (TAT)	Measures the functionality of the specimen referral network and the reference lab functionality	Number of samples of suspected cases whose lab test results have returned within the TAT	Total number of samples of suspected cases sent	• OPD and IPD registers • Line list	80%	

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Prepare	Availability of key supplies for emergency response (see kit)***	Measure preparedness of a facility	N/A	N/A	• H/F Inventory • Observation	N/A	Quarterly
	Availability of multi-hazards emergency preparedness and response plan	Measure preparedness of health facility	N/A	N/A	• Annual Work plans		Annually
Respond	Availability of a functional Health Facility Committee	Measure ability to respond at health facility level	N/A	N/A	• Minutes from health facility records		Quarterly
	Case fatality rates for each epidemic- prone disease reported	Measure response activities (early treatment-seeking behaviour and quality of healthcare services)	Number of deaths from each of the epidemic-prone diseases	Number of cases from the same epidemic- prone diseases	• Routine and outbreak investigation reports	Depends on disease	Periodic
	Attack rate for each epidemic-prone disease reported	Measure response activities	Number of new cases de-tected	Population at risk	• Routine and outbreak investigation reports	Depends on disease	
	Availability of IPC measures in all health facilities including an isolation unit/ward holding area	Measures ability to prevent nosocomial infections	N/A	N/A	• Observation		Annually
	Number of isolation units/ wards in all hospitals	Measures ability to effectively manage highly infectious patients	N/A	N/A	• Observation	At least one (1) per hospital	
	Proportion of HCW trained in IPC in the last 12 months at the facility	Measures ability to prevent nosocomial infections	Number of HCW trained in IPC in last 12 months at a facility	Total number expected to be trained	• Training reports	80%	

*** Tracer emergency kit: e.g. gloves, I.V fluids, medicines masks, aprons, boots, disinfectants, and specimen collection kits.

Annex 8B: Indicators for monitoring IDSR core functions at the district level

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Identify	Proportion of health facilities with Standard case definition (SCD)	Correctly identifying and filling cases/events	Number of HF with SCD	Total number of all HF	• Checklist for the in charge at the H/F	100%	Quarterly
	Proportion of health facilities reporting information using EBS	Measure the ability of the system to capture unusual events	Number of HF reporting information from EBS	Total number of all HF	• Routine summary reports and supervisory reports	80%	Annually
	Proportion of health facilities including district, intermediate and tertiary hospitals with standardized registers and IDSR forms	Measure the availability of registers and IDSR forms	Number of HF with registers and IDSR forms	Total Number of all HF	• Checklist for the in charge at the HF	100%	Quarterly
	Proportion of health facilities including hospitals (intermediate/specialized) submitting complete IDSR reports to the district	Measures the completeness of submission of surveillance reports	Number of health facilities that submitted complete surveillance reports on to the district	Total number of health facilities in the district	• Monitoring chart for submission of complete reports	80%	
Reporting	Proportion of health facilities including district, intermediate and tertiary hospitals submitting IDSR reports on time to the district	Measures the timeliness of submission of surveillance reports	Number of health facilities that submitted surveillance reports on time to the district	Total Number of health facilities in the district	• Monitoring chart for timely submission of report	80%	Monthly
	Proportion of health facilities including hospitals (district intermediate and tertiary) submitting complete IDSR reports to the district	Measures the completeness of submission of surveillance reports	Number of health facilities that submitted complete surveillance reports on to the district	Total Number of health facilities in the district	• Monitoring chart for submission of complete reports	80%	Monthly
	Proportion of cases of diseases targeted for elimination, eradication and any other diseases selected for case-based surveillance reported with case-based forms or line lists.	Measures reporting of surveillance data with detailed information to use for further analysis	Number of diseases targeted for elimination, eradication, and any diseases selected for case-based surveillance reported with case-based forms or line list	Total number of cases of diseases selected for case-based surveillance that occurred in the district	• Routine summary reports and case-based or line listing reports for diseases targeted for elimination and eradication and for any diseases selected for case-based surveillance	80%	

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Analysis and Interpretation	Proportion of health facilities that have current trend analysis	Measures the practice and capacity of the health facility team to detect trends suspected possible outbreaks	Number of health facilities that have current trend analysis for selected priority diseases	Total number of health facilities in the district	• Supervisory report • Health facility data analysis tools	80%	Proportion of health facilities that have current trend analysis
	Proportion of health facilities that have current lab analysis data for priority diseases analysis (if applicable)	Evidence of routine laboratory data analysis and interpretation	Number of health facilities that have lab data analysis for selected priority diseases.	Total number of health facilities in the district	• Laboratory register	80%	Quarterly
	Proportion of priority diseases for which a current line graph is available.	Measures the practice and capacity of the district health management team to analyse surveillance data	Number of selected diseases (at least malaria and bacterial meningitis in districts at high risk for meningitis) for which a line graph is available and current.	Total number of selected diseases with a line graph (at least malaria and bacterial meningitis if district is at high risk for meningitis)	• Indicator monitoring chart District analysis book	80%	Quarterly
Investigation and confirmation of suspected cases	Proportion of suspected outbreaks of epidemic-prone diseases notified to the district within 24 hours or surpassing the epidemic threshold	Measures use of data and thresholds for early detection of outbreaks and timely reporting at the local level	Number of suspected outbreaks of epidemic-prone diseases notified to the province / region within 24 hours of surpassing the epidemic threshold	Number of suspected outbreaks of epidemic-prone diseases in the district	• Log of suspected outbreaks and rumors. • District analysis book or other routine analysis tool	80%	
	Proportion of reports of investigated outbreaks that include analysed case-based data	Measures availability of additional variables for further analysis	Number of outbreak investigation reports that include case-based data	Total number of outbreak investigation reports conducted in the district	• Investigation report • Epidemic curve map • Person analysis table • Line lists or case-based reporting forms	80%	
	Proportion of investigated outbreaks with laboratory results within 7 days	Measures capacity of laboratory to confirm diagnosis and involvement of laboratory in surveillance activities	Number of investigated outbreaks with laboratory results in a given time period	Total number of investigated outbreaks that occurred in a given time period	• Log of suspected outbreaks and rumours • Laboratory reports • Outbreak investigation reports	80%	
	Proportion of confirmed outbreaks with a nationally recommended public health response	Measures capacity of the district to respond to outbreaks	Number of confirmed outbreaks with a nationally recommended response	Number of confirmed outbreaks in the district	• Log of suspected outbreaks and alerts • Outbreak investigation reports • Supervisory reports	80%	
	Proportion of samples from suspected outbreak timely transported within 24 hours	Measure capacity to refer samples in a timely manner	Number of suspected outbreaks of which samples were sent on time (within 24 hours)	Number samples collected from suspected outbreaks	• Laboratory register		

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Prepare	Presence of a functional central unit for coordination of PHEMC (PH EOC)	Measure district readiness	N/A	N/A	• Minutes of reports • Annual work plans		Annually
	Proportion of health facilities with emergency preparedness and response (EPR) plans	Measure preparedness of health facility	Number of HF with EPR plans	Number of all HF	• Annual work plans		Annually
	Availability of a District Emergency Preparedness and Response Plan	Measure preparedness of district	N/A	N/A	• Annual work plans		Annually
	Existence of funds for emergency response (Or budget line for emergency funds)	Measure preparedness of health facility	N/A	N/A	• Annual work plans		Annually
	Proportion of health facilities that experienced shortages of drugs and supplies for the most recent outbreak (define the time frame e.g. 3, 6, 12 months)	Measure preparedness of health facility	Number of HF that experienced shortage	Total Number of all HF	• HF inventory		
	Proportion of health facilities that have contingency stocks for 3-6 months	Measure preparedness of health facility	Number of HF with contingency stocks	Total Number of all HF	• HF Inventory • Observation		Quarterly
	Proportion of HF with availability of laboratory diagnostic reagents	Measure the capacity of preparedness of a HFs	Number of HFs with available lab reagents	Total Number of HF	• HF Inventory • Observation		Quarterly
	Proportion of Health facilities with available supplies for specimen collection and transportation	Measure the capacity of preparedness of a HFs	Number of HFs with available specimen collection and transportation	Total Number of HF	• HF Inventory • Observation		
	Proportion of Labs with performance reports of routine quality assurance	Measure the capacity of preparedness of a HFs	Number of labs with performance of routine QA	Total Number of Labs	• Quality reports		Quarterly

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Respond	Presence of a Functional Public Health Emergency Management Committee	Measure ability to respond at district level	N/A	N/A	• Minutes from District Health Office		Quarterly
	Proportion of HFs with functional Public Health Emergency Management Committee	Measure ability to respond at health facility level	Number of HFs with functional committee	Total Number of all HF	• Minutes from Health Facility records		Quarterly
	Availability of Public Health Emergency Rapid Response Team (PHERRT)	Measure ability to respond at health facility level	N/A	N/A	• Minutes from District Health Office		Quarterly
	Case Fatality rate for each epidemic prone disease reported	Measures quality of case management	Number of deaths from each of the epidemic prone diseases	Number of cases from the same epidemic prone diseases	• Routine reports and outbreak investigation	Depends on disease	
	Attack rate for each outbreak of priority disease	Helps to identify the population at risk and efficacy of the intervention	Number of new cases of an epidemic prone disease that occurred during an outbreak	Number of population at risk during the outbreak	• Demographic data about the district, Outbreaks investigation report with line lists or case based forms	Depends on disease	
	Proportion of outbreaks or any public health event responded to in the previous 12 months	Measures early detection and timely reporting of outbreaks	Number of suspected outbreaks of epidemic prone diseases responded	Total number of suspected outbreaks of epidemic prone diseases/events	• Health facility log of suspected outbreaks and alerts	80%	
	Proportion of Hospitals with Infection Prevention and Control (IPC) requirements established including isolation ward/unit	Measures the practice and the capacity of hospitals to apply infection control requirements	Number of Hospitals that reported having established Infection Prevention and Control (IPC) requirements	Total number of hospitals in the district	• Routine summary reports and supervisory reports • Observation of IPC practices		Annually
Provide Feedback	Availability of feedback reports/ letters/bulletin	Presence of a feedback mechanism	N/A	N/A	• Observation		Quarterly
	Proportion of feedback bulletins/reports sent to the lower level	Presence of a feedback mechanism	Total number of reports/bulletins or any form of feedback document expected to be sent to lower levels	Total number of reports/bulletins or any form of feedback document expected to be sent to lower levels	• Observation		Quarterly

Annex 8C: Indicators for monitoring IDSR core functions at the regional level

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Identify	Proportions of districts with IDSR guidelines to guide identification of cases	Correctly identifying and filling cases/events	Number of districts with guidelines	Total number of all districts	• District inventory	100%	Quarterly
	Proportion of districts reporting information using EBS	Measure the ability of the system to capture unusual events	Number of districts reporting information using event-based surveillance methods	Total number of all districts	• Routine summary reports and supervisory reports	80%	Annually
	Number of events recorded in the logbook of rumour	Measure the ability of the region to capture unusual events from unofficial reports sources	N/A	N/A	• Region logbook		
	Proportion of districts with routine data validation system	Measures the routine validation of data	Number of districts having routine data validation system	Total number of all districts	• District and region reports		
Reporting	Proportion of monthly surveillance reports submitted from the district to the region on time in the last 3 months	Measures the practice of timely submission of surveillance data	Number of districts that submitted IDSR reports on time to the region	Total number of districts that report to the regional level	• Monitoring chart • Routine summary reports	80%	quarterly
	Proportion of diseases targeted for elimination, eradication and any diseases selected for case-based surveillance reported with case-based forms or line lists.	Measures reporting of surveillance data with detailed information to use for further analysis	Number of diseases targeted for elimination, eradication, and any diseases selected for case- based surveillance reported with case-based forms or line list	Total number of diseases targeted for elimination, eradication and any other disease selected for case-based surveillance	• Routine summary reports and case-based or line listing reports	80%	quarterly

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Analysis and Interpretation	Proportion of districts in which a current line graph is available for selected priority diseases	Measures the practice and capacity to analyse surveillance data	Number of priority diseases for which a current line graph is available in the districts.	Total number of districts	• Supervisory reports district analysis book	80%	
	Proportion of districts in which an updated spot map of cases is available for selected priority diseases	Measures the practice and capacity to analyse surveillance data	Number of priority diseases for which an updated spot map is available in the districts.	Total Number of districts	• Supervisory reports District analysis book	80%	
	Proportion of districts that report laboratory data for diseases under surveillance	Measures if districts are collecting and reporting lab data to higher level	Number of district labs that submitted monthly data to higher level	Total number of district labs	• Supervisory reports District analysis book		
Investigation and confirmation of suspected cases	Proportion of suspected outbreaks of epidemic prone diseases notified to the national level within 24 hours of surpassing the epidemic threshold	Measures early detection and timely reporting of outbreaks	Number of suspected outbreaks of epidemic prone diseases notified to the national level within 24 hours of surpassing the epidemic threshold	Total number of suspected outbreaks of epidemic-prone diseases	• Log of suspected outbreaks and alert • Routine summary reports	80%	Monthly
	Proportion of reports of investigated outbreaks that includes analysed case-based data	Measures availability of additional variables for further analysis including possible risk factors involved	Number of outbreak investigation reports that include epi- curve, mapping, personal tables and case-based forms or line lists	Total number of outbreaks investigation reports	• Investigation reports • Routine summary reports	80%	Monthly
	Proportion of investigated outbreaks with laboratory results	Measures capacity of the laboratory to confirm the diagnosis and involvement of laboratory in the surveillance activities	Number of investigated outbreaks with laboratory results	Total number of investigated outbreaks	• Outbreak investigation reports • Laboratory reports • Routine summary reports • Log of outbreaks and rumours	80%	
	Proportion of confirmed outbreaks with a nationally recommended public health response	Measures capacity of the region to respond to outbreaks	Number of confirmed outbreaks with a nationally recommended public health response	Total number of confirmed outbreaks	• Log of suspected outbreaks and alerts • Outbreak investigation reports • Supervisory visit reports	80%	
	Proportion of labs performing routine testing and reporting of antimicrobial resistance	Measure capacity in readiness	Number of labs reporting AMR results	Total labs	• National Lab Policy Document • Lab register		

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Prepare	Presence of a functional coordination of PHEMC (EOC) at regional level	Measure regional readiness	N/A	N/A	• Minutes of reports, Annual work plans		Annually
	Proportion of districts with established functional Public Health Emergency Management Committee	Measure regional readiness	Number of districts with the functional Public Health Emergency Management Committee	Total number of all districts	• Supervision reports		Quarterly
	Proportion of districts with emergency preparedness and response plans	Measure preparedness of districts	Number of districts with EPR plan	Total number of all districts	• Supervision reports		Annually
	Proportion of districts with Public health risk and resource mapping	Measure the practice and capacity of the district to conduct mapping of available resources and risks	Number of districts that reported having conducted Public health risks and resources mapping	Total number of districtS	• Risk assessment and mapping reports and resource mapping reports	80%	Annually
	Proportion of districts with funds for emergency preparedness and response	Measure preparedness of District	Number of districts with Budgets/Budget line Number of district labs with performance of routine QA	Number of all districts	• Annual Work plans		Annually
	Proportion of districts that have contingency Stocks including lab supplies for 3-6 months	Measure preparedness of district	Number of districts with contingency stocks	Number of all districts	• District/Region Inventory • Observation	80%	Quarterly
	Proportion of districts labs with performance reports of routine quality assurance	Measure the capacity of preparedness	Number of district labs with performance of routine QA	Number of all district labs	• Quality assurance reports		Quarterly

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Respond	Proportion of districts with functional Public Health Emergency Management Committee (PHEMC)	Measure ability to respond at district/region level	Number of districts/region with functional committee	Number of districts/regions	• Supervisory reports Minutes of meetings of PHEMC		Quarterly
	Proportion of districts with functional Public Health Emergency Rapid Response Teams (PHERRTs)	Measures ability of Region and districts preparedness towards emergencies	Number of districts with functional PHERRTs	Total number of districts	• Supervisory reports • Minutes of meetings of PHERRT		Quarterly
	Attack rate for each outbreak of priority disease	Helps to identify the population at risk and efficacy of the intervention	Number of new cases of an epidemic prone disease that occurred during an outbreak	Number of populations at risk during the outbreak	• Demographic data about the district • Outbreaks investigation report with line lists or case-based forms	Depends on disease	
	Case Fatality rate for each epidemic prone disease reported	Measures quality of case management and response to outbreak	Number of deaths from each of the epidemic prone disease during an outbreak	Total number of cases from the same epidemic prone disease during an outbreak	• Routine reports and outbreak investigation	Depends on disease	
	Proportion of outbreaks or any public health event responded to in the previous 12 months	Measures early detection and timely reporting of outbreaks	Number of suspected outbreaks of epidemic prone diseases responded to in the previous 12 months	Total number of suspected outbreaks of epidemic prone diseases/events in the previous 12 months	• Health facility log of suspected outbreaks and alerts	80%	
	Proportion of hospitals with Infection Prevention and Control (IPC) requirements	Measures the practice and the capacity of the hospital to apply infection control measures	Number of hospitals that reported having established Infection Prevention and Control (IPC) requirements established	Total number of hospitals in the region	• Routine summary reports and supervisory reports	80%	Annually
Provide Feedback	Proportion of districts with epidemiological bulletin/ newsletters/briefs summaries	Presence of a feedback mechanism in the region and districts	Number of districts with epi-bulletin	Total number of districts	• Supervision reports		

Annex 8D: Indicators for monitoring IDSR core functions at the national level

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Identify	Proportions of districts with IDSR guidelines to identify cases	Correctly identifying and filling cases/events	Number of Districts with Guidelines	Total number of all districts	• District Inventory	100%	Quarterly
	Proportion of districts reporting information using EBS	Measure the ability of the system to capture unusual events	Number of districts reporting information using event-based surveillance methods	Total number of all districts	• Routine summary reports and supervisory reports	80%	Annually
	Number of events recorded in the logbook of alerts	Measure the ability of the national to capture unusual events from unofficial reported sources	N/A	N/A	• National logbook of alerts		
	Proportion of districts with routine data validation system	Measure the routine validation of data	Number of districts having routine data validation system	Total number of all districts	• National Reports		
Reporting	Proportion of health facilities submitting IDSR reports on time to the district	Measures practice of timely submission of surveillance data from health facilities to district	Number of health facilities submitting reports on time to the district	Number of districts	• Summary reporting forms	80%	
	Proportion of monthly surveillance reports submitted from the region to the national level on time in the last 3 months	Measures the practice of timely submission of surveillance data	Number of regions that submitted IDSR reports on time to the national level	Total number of region that report to the national level	• Monitoring chart • Routine summary reports	80%	Quarterly
	Proportion of cases of diseases targeted for elimination, eradication and any diseases selected for case-based surveillance reported with case-based forms or line lists.	Measures reporting of surveillance data with detailed information to use for further analysis	Number of diseases targeted for elimination, eradication, and any diseases selected for case- based surveillance reported with case-based forms or line list	Number of diseases targeted for elimination, eradication and any other disease selected for case-based surveillance	• Routine summary reports and case-based or line listing reports	80%	Quarterly

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Analysis and Interpretation	Proportion of districts in which a current line graph is available for selected priority diseases	Measures the practice and capacity to analyse surveillance data	Number of priority diseases for which a current line graph is available in the districts.	Number of districts	• Supervisory reports District analysis book	80%	
	Proportion of regional laboratories reporting analysed lab data to the national lab	Measures how well regional levels analyse district laboratory data	Number of provincial laboratories analysing and reporting to NPHL monthly	Total number of regional labs	• National Public Health Laboratory		
	Proportion of districts that report laboratory data for diseases under surveillance	Measures if districts are collecting and reporting lab data to higher level	Number of district labs that submitted monthly data to higher level	Total number of district labs	• National log book of records received		
Investigation and confirmation of suspected cases	Proportion of suspected outbreaks of epidemic prone disease notified to the national level within 2 days of surpassing the alert threshold	Measures early detection and timely reporting of outbreaks	Number of suspected outbreaks of epidemic prone diseases notified to the national level within 2 days of surpassing the alert threshold	Total number of suspected outbreaks of epidemic prone diseases	• Log of suspected outbreaks and alerts • Routine summary reports	80%	Monthly
	Proportion of reports of investigated outbreaks that includes analysed case-based data	Measures availability of additional variables for further analysis including possible risk factors involved	Number of outbreak investigation reports that include epi curve, mapping, personal tables and case-based forms or line lists	Number of outbreaks investigation reports	• Investigation reports • Routine summary reports	80%	Monthly
	Proportion of investigated outbreaks with laboratory results	Measures capacity of the laboratory to confirm the diagnosis and involvement of laboratory in the surveillance activities	Number of investigated outbreaks with laboratory results	Number of investigated outbreaks	• Outbreak investigation reports • Laboratory reports • Routine summary reports • Log of outbreaks and rumours	80%	
	Proportion of confirmed outbreaks with a nationally recommended public health response	Measures capacity of the region to respond to outbreaks	Number of confirmed outbreaks with a nationally recommended public health response	Number of confirmed outbreaks	• Log of suspected outbreaks and alerts • Outbreak investigation reports • Supervisory visit reports	80%	
	The number of epidemics detected at the national level and that were missed by district level	Checks the capacity of the entire health system to detect epidemics and shows that the national level is checking whether districts are observing trends	Number of epidemics detected by the regional or national level from analysing district specific data	Total number of epidemics reported by the districts	• District summary reporting forms • District analysis book • Supervisory reports Standard surveillance reports	zero	

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Prepare	Presence of a functional coordination of PHEMC (PHEOC) at national level	Measure the National level readiness	N/A	N/A	• Minutes of meetings, • Annual work plans		Annually
	Proportion of regions with established functional coordination mechanism/body for public health epidemics/ emergency	Measure the regional readiness	Number of regions with the functional mechanism body for coordination of public health emergencies	Total number of all regions	• Supervision reports		Quarterly
	Proportion of regions with emergency preparedness and response (EPR) plans	Measure preparedness of regions	Number of regions with EPR plan	Total number of all regions	• Supervision reports		Annually
	Proportion of regions with public health risks and resources mapped	Measure the practice and capacity of the regions to conduct mapping of available resources and risks	Number of regions that reported having conducted public health risks and resources mapping	Total number of regions targeted for public health risks and resources	• Risk assessment and mapping reports and	80%	Annually
	Proportion of regions with funds for emergency preparedness and response	Measure preparedness of regions	Number of regions with budgets/budget line	Number of all regions	• Annual Work plans		Annually
	Proportion of regions that have contingency stocks including lab supplies for 3-6 months	Measure preparedness of regions	Number of regions with contingency stocks	Number of all regions	• District/Region Inventory • Observation		Quarterly
	Proportion of regions labs with performance reports of routine quality assurance	Measure the capacity of preparedness	Number of regions abs with performance of routine QA	Number of regions labs	• Quality reports		Quarterly

IDSR Core Function	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Respond	Proportion of regions with functional Public Health Emergency Management committee	Measure ability to respond at regions level	Number of regions with functional committee	Number of regions	• Supervisory reports		Quarterly
	Proportion of regions with functional PHERRT	Measure regions preparedness	Number of regions	Total number of regions	• Supervisory reports		Quarterly
	Attack rate for each outbreak of priority disease	Helps to identify the population at risk and efficacy of the intervention	Number of new cases of an epidemic prone disease that occurred during an outbreak	Number of population at risk during the outbreak	• Demographic data about the district • Outbreaks investigation report with line lists or case based forms	Depends on disease	
	Case fatality rate for each epidemic prone disease reported	Measures quality of case management	Number of deaths from each of the epidemic prone diseases	Number of cases from the same epidemic prone diseases	• Routine reports and outbreak investigation	Depends on disease	
	Proportion of outbreaks or any public health event responded to in the previous 12 months	Measures early detection and timely reporting of outbreaks	Number of suspected outbreaks of epidemic prone diseases responded	Total number of suspected outbreaks of epidemic prone diseases/events	• Health facility log of suspected outbreaks and alerts	80%	
	Proportion of hospitals with Infection Prevention and Control (IPC) requirements	Measures the practice and the capacity of the hospital to apply infection control measures	Number of Hospitals that reported having established Infection Prevention and Control (IPC) requirements established	Total number of hospitals in the country	• Routine summary reports and supervisory reports	80%	Annually
Provide Feedback	Proportion of regions with epidemiological bulletin/ newsletters/briefs summaries	Presence of a feedback mechanism	Number of regions with epi-bulletin	Total number of regions	• Supervision reports		

Annex 8E: Monitoring chart for performance of IDSR indicators at health facility level

Republic of Namibia

Ministry of Health and Social Services

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 the indicators relevant to health facility performance for IDSR.
Each month, summarize and compile the health facility's summary data for priority diseases. Report the summary data to the district level on time. Record the indicator results on this chart. Share this chart with the district supervisor during his or her visit to the health facility, or bring it to the quarterly district meeting.

Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Availability of SCD and IDSR forms/registers												
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 district												
Proportion of cases of diseases selected for case-based surveillance, which were reported to the district 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												
Proportion of suspected outbreaks of epidemic prone diseases notified to the district 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												
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 following checklist items												
Were surveillance reports submitted on time?												
Are the trend graphs up to date?												
If YES, have you observed any changes in the trends?												
If YES, has the threshold been crossed?												
If YES, have you taken action to alert the district?												

ANNEX 8F: Monitoring chart for IDSR performance indicators at district or regional level

Republic of Namibia

Ministry of Health and Social Services

Monitoring chart for IDSR performance indicators at district or regional level

NOTE: Please compute the actual percentage for each cell.

District:_____**Region:**_____**Year:**_____

Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Proportions of Health facilities with SCD												
Proportion of districts/regions reporting information using EBS												
Proportion of health facilities within the district with standardized registers and IDSR forms												
Number of events recorded in the district logbook for rumours												
Proportion of health facilities submitting IDSR reports on time to the district												
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												

Annex 8G: Sample form for recording timeliness and completeness of monthly reporting from the health facility to the district

Republic of Namibia

Ministry of Health and Social Services

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

NOTE: *The timeliness and completeness are expressed as percentages (%). When the surveillance system is good, the rates for timeliness and completeness should approach 100%. This table allows for monitoring the progress of these two indicators in the district so that action can be taken to improve timeliness for each health facility in the district.

Legend:
T = arrived on time
L = arrived late
W=report not received

Country:_____**District:**_____ **Health Facility:**_____**Year:**_____

Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total number of reports expected (N)												
Total reports sent on time (T)												
Total reports sent late (L)												
Total number of reports not received (W)												
Timeliness of the reports = 100 * T / N												
Completeness of reporting = 100 * (N-W) / N												

Annex 8H: Checklist for monitoring IDSR activities at the health facility

Republic of Namibia

Ministry of Health and Social Services

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	How often do you collect information from the community about reports of suspected cases or deaths due to a priority disease or condition?		
Register cases	Are diagnoses of cases of priority diseases recorded in the clinic register according to the standard case definition?	Yes ☐ No ☐	
Report	1. Do health staff use a standard case definition to report the suspected cases and outbreaks? 2. Do you record information about immediately-notifiable diseases on a case form or line list?	Yes ☐ No ☐ Yes ☐ No ☐	
Analyse and Interpret	1. Do you plot the numbers of cases and deaths for each priority disease on a graph? (Ask to see the health facility's analysis book. Look to see if the trendlines are up-to date.) 2. Do you plot the distribution of cases on a map?	Yes ☐ No ☐ Yes ☐ No ☐	
Investigate and Confirm Reported Cases and Outbreaks	1. If an epidemic-prone disease was suspected, was it reported immediately to the district office? 2. For the cases of priority diseases needing laboratory tests seen since the last supervisory visit, how many had laboratory results? 3. Are appropriate supplies available or set aside for collecting laboratory specimens during an urgent situation? Ask to see the supply to confirm availability.	Yes ☐ No ☐ Number of results obtained:_____ Number of expected cases seen:_____ Yes ☐ No ☐	
Respond	1. Are appropriate supplies available for responding to a confirmed case or outbreak? (e.g., immunization supplies and vaccine, ORS, antibiotics, etc.) Please show me the supplies for carrying out a recommended response. 2. Who is the outbreak coordinator for this facility? 3. 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:: Yes ☐ No ☐	
Provide Feedback	1. How often do you report information to the community? 2. Do you receive the latest bulletin from the (central, subnational) level?	Yes ☐ No ☐	
Evaluate and Improve the System	1. Were the last 3 routine monthly reports sent to the district office? 2. Were the last 3 routine monthly reports sent on time?	Yes ☐ No ☐ Yes ☐ No ☐	
Epidemic Preparedness	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 8I: Sample weekly and monthly public health bulletin

Republic of Namibia

World Health Organization
NAMIBIA

Ministry of Health and Social Services

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE BULLETIN

Week 1-12 of 2021 **Date: 03 January- 27 March 2021**

Highlights during the reporting period:

- Five (5) samples out of the ten (10) collected from suspected Measles cases tested positive.
- Three of the positive cases are from Okahandja district, while the remainder are respectively from Windhoek and Mariental. The three (3) positive cases from Okahandja were all seen and tested during week 1 and 2 which translates as a Measles outbreak. Outbreak investigation is ongoing and all bordering districts were informed.
- A suspected case of CCHF has been admitted to Gobabis hospital on 27 March 2021 with history of tick bite coupled with signs and symptoms consistent with CCHF. A sample was collected and results are still pending. No additional cases were reported to date.
- One (1) confirmed case of meningococcal meningitis was reported from Oshikuku District on 11 March 2021, and the patient demised on the 24 March 2021. The response team is doing investigations for possible additional cases, and the contacts are under surveillance and have been provided with prophylaxis.

Republic of Namibia

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Sample of weekly IDSR reporting at district level

Reporting coverage (completeness) and timeliness from the districts in Namibia, Week 1 of 2021)

District	Number of expected reports	Number of reports received	Completeness %	On time
Okongo	6	5	83.3	Yes
Okakarara	7	6	85.7	Yes
Omaruru	6	6	100	Yes
Usakos	6	5	83.3	Yes
Grootfontein	8	8	100	Yes
Engela	18	16	88.8	Yes

Annex 8J: Indicators for monitoring performance of core functions of IDSR

1. Proportion of health facilities submitting weekly (or monthly) surveillance reports on time to the district.
2. Proportion of districts submitting weekly (or monthly) surveillance reports on time to the next higher level.
3. Proportion of cases of diseases targeted for elimination, eradication and any other diseases selected for case-based surveillance that were reported to the district, using case-based or line-listing forms.
4. Proportion of suspected outbreaks of epidemic-prone diseases notified to the next higher level within 24 hours of crossing the epidemic threshold.
5. Proportion of health facilities in which a current trend analysis (line graph or histogram) is available for selected priority diseases.
6. Proportion of districts in which a current trend analysis (line graph or histogram) is available for selected priority diseases.
7. Proportion of reports of investigated outbreaks that include analysed case-based data.
8. Proportion of investigated outbreaks with laboratory results within 7 days.
9. Proportion of confirmed outbreaks with a nationally recommended public health response within 24 to 48 hours of notification. (target >80%)*
10. Case fatality rate for each epidemic-prone disease reported.
11. Attack rate for each outbreak of a priority disease.
12. The number of epidemics detected at the national level that were missed by the district level during the last year
13. Proportion of selected laboratories that are reporting monthly laboratory data for priority diseases under surveillance.
14. Proportion of district laboratories that received at least one supervisory visit, and also received written feedback from the regional or national level during the last year.

Footnote: *What constitutes response standards within 24 to 48 hours

a. Conduct initial rapid assessment/situational analysis
b. Inform WHO of the outbreak/public health event
c. Activate country emergency response structures and assign critical functions.
d. Initiate response activities using a pillar approach
e. Convene first multi-sectoral emergency coordination meeting
f. Develop an initial response strategy, objectives and action plan
g. Issue initial internal situation report (SITREP)

References

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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
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SECTION 9

ELECTRONIC INTEGRATED DISEASE SURVEILLANCE AND RESPONSE (eIDSR)

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9. Electronic IDSR (eIDSR)

Electronic IDSR is the application of electronic tools on the principles of IDSR to facilitate prevention, prediction, detection, reporting, and response.

It is based on:

- Standardised interoperable and interconnected information systems, administered within the national context.
- Rapid collection, analysis, reporting, and use of disease/events data in real-time for appropriate public health action.

The use of paper-based tools for the implementation of IDSR has been an instrumental strategy for strengthening public health surveillance in the country since IDSR was adopted in 2003. With the adoption of the International Health Regulations IHR (2005), which requires countries to strengthen capacity for disease surveillance and response, application of electronic tools to enhance real-time surveillance can improve timeliness of outbreak detection.

In recent years technological, analytical innovations have emerged, as an approach which can be used to facilitate rapid transmission of public health surveillance information, consequently aiding timely detection of, and response to, outbreaks and other public health events. 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. eIDSR provides new opportunities for acceleration of the achievement of the IHR (2005) core capacities.

9.1 eIDSR in the context of the Health Management Information System (HMIS)

HMIS is used in the MoHSS to facilitate routine collection of data to support planning, management and decision-making in health service delivery. HMIS routinely collects data about diseases, events and conditions, as well as other administrative and service provision data. The primary source of the data is the health facility Outpatient (OPD) or Inpatient (IPD) register. The most widely used electronic platform of HMIS is the District Health Information System Version 2 (DHIS2).

In both HMIS and eIDSR, the source data is derived from the health facility OPD or IPD register. eIDSR is an enabling platform for reporting in real time for IDSR priority diseases. In the eIDSR platform, there is an active and timely means of collection of data on IDSR priority diseases, and conditions which are extracted from either OPD or IPD registers, including patient records, and they are reported immediately, weekly or monthly.

9.2 eIDSR in the context of eHealth

In 2013, Namibia adopted an eHealth resolution (AFR/RC60/R3) to address the use of Information and Communication Technology (ICT) for health and health-related fields, including disease surveillance. The recommended actions included the development of national policies, strategies, norms and appropriate governance mechanisms resulting in long-term strategic plans and frameworks for eHealth capacities in the country.

eHealth encompasses a range of services and systems, including:

- health and medical informatics;
- tele-health: the transmission of health-related services or information over the telecommunications infrastructure;
- e-learning: utilizing technology to access education outside of the traditional classroom; and
- m-health: the use of mobile phones and other wireless technologies for medical health.

WHO member states echoed the same sentiment in the recent 71st World Health Assembly and unanimously agreed that digital health solutions should complement, and enhance existing health service delivery models. They subsequently adopted the new resolution on digital health, which underscores the importance of nationally-supported digital health strategies, supporting and investing in the digital health enabling environment (including policy, standards, capacity, interoperability, privacy and security), and transitioning to sustainability and government ownership.

Digital health (sometimes called eHealth), provides cost-effective and secure use of ICTs in health, and health-related fields. Digital health, as defined by the Broadband Commission for Sustainable Development, is an umbrella term that encompasses all concepts and activities at the intersection of health and information, and communications technology (ICTs). This includes the delivery of health information, using ICTs to improve public health services, and using health information systems to capture, store, manage or transmit information on patient health, or health facility activities. ICTs are defined as tools that facilitate communication, and the processing and transmission of information by electronic means, encompassing a full range of tools like radio and television, to telephones (fixed and mobile), computers, and the Internet. eIDSR, which is part of eHealth, is one of the essential innovations for fulfilment of the regional committee recommendations on the use of information technology, which is core in the achievement of the IHR (2005) requirements. Standardization of electronic tools and sustained infrastructure across the country will promote the easy generation, and sharing of district and regional profiles of priority diseases, conditions and events.

9.3 Rationale of eIDSR

The limitations of the current approaches to IDSR data collection and transmission are attributed to the fact that manual procedures and paper methods are still in use, to collect and transmit data. Submitting and transmitting the data is a challenge for some remote health facilities, who do not have the necessary dedicated transport to submit their reports on time. This leads to delays in getting information on time for action, especially if there is a suspected outbreak.

The eIDSR system aims at facilitating the work of every staff member in a health system by improving disease surveillance, using electronic tools, hence strengthening surveillance and response capacities. In the long term this reduces morbidity and mortality from epidemic- prone diseases as well as other public health events.

eIDSR is thus likely to improve the following:

- Timeliness and completeness of reporting;
- Early detection, investigation, and response to outbreak or public health events ;
- Reduce manual data entry that is prone to errors;
- Systematic information sharing across levels and sectors;
- Combining data streams; and
- Data use, analysis, and analytics.

There have recently been various supporting initiatives and resolutions, regionally and globally which have recognized the potential of digital technology, to advance the Sustainable Development Goals (SDGs), and in particular to support health systems in all countries, in health promotion and disease prevention.

The eIDSR has developed to reflect the following recently adopted, and overarching health frameworks:

1. Integrated Disease Surveillance and Response (AFR/RC/48.8);
2. IHR (2005) (WHA58.3);
3. Regional Strategy for Health Security and emergencies strategy (AFRO/RC66/6);
4. eHealth resolution and decision (WHA58.28); and
5. Digital health (WHA71.7).

9.4 Benefits of eIDSR

The eIDSR provides real-time information for immediate action.

The potential benefits of eIDSR include:

- **Early alert and detection**
  With eIDSR, the speed of outbreak detection is vastly 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, enabling opportunities for prevention and control. (Refer to the following CDC study: 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.
  (Source: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5749a2.htm)

- **Timely reporting**
  eIDSR tools allow for the rapid and timely transmission of data from lower primary reporting units to the higher levels, to enable appropriate public health action.

- **Standardization of data**
  Standardization of tools in eIDSR system enables data gathering to be consistent and complete, to more easily facilitate data exchange and comparison across health facilities.

- **Better data transmission and management, including storage**
  One of the major challenges of paper-based reporting is the need to compile reports from various sources, and provide these to higher level offices at regular intervals, and to different administrative levels. Data storage and transport can also be challenging, because of the risk of data damage and loss.

  eIDSR allows for faster data transmission, and data is also organized into a format that is user-friendly and easier to interpret.

- **Interoperability and sharing of data**
  eIDSR provides an opportunity for the exchange and use of information across entities, especially if standards and workflow have been well developed for the eIDSR system to allow interoperability with other information systems.

- **Automated transmission, analyses and improved quality data**
  The paper-based reporting approach runs the risk of omitting valuable information when reporting to higher administrative levels.

  eIDSR reduces the number of data entry errors and facilitates automated data analysis, thus saving considerable effort for healthcare workers.

- **Ultimately contribute towards good response, better monitoring and evaluation**
  eIDSR provides a platform for data storage and automatic analysis across the health facilities, for better monitoring and evaluation of various public health interventions.

- **Reduces cost**
  eIDSR leads to the early detection of disease outbreaks, which in effect can contribute to the overall cost reduction associated with management of these outbreaks.

(Studies conducted by Valenciano et al, 2003 and 2003; Pinto el al 2005, demonstrated that the simple advance of a computerised reporting system, using country-identified thresholds for priority diseases did show improvements in monitoring trends and predicting outbreaks, in a matter of weeks post-implementation.)

9.5 Key guiding principles in establishing eIDSR

The following are key guiding principles in the establishment of eIDSR:

Use of existing infrastructure: eIDSR should be built on existing frameworks and systems, where possible, i.e., paper-based IDSR, HMIS, DHIS2, EWARS etc. This enables easy adaptability by the implementers, and promotes smooth transitions. If there is already an existing infrastructure, the introduction of eIDSR may not require major customization, which could also be costly.

Standardization: Standardization of data and electronic tools promote uniformity in data collection and aggregation. Standardization further promotes comparison between the various levels of the health systems, and between countries.

Integration: IDSR is built on the premise of integration. eIDSR should therefore also be implemented in the spirit of integration. This could entail integration of the various data sources and information systems from other health programs (e.g., Malaria, EPI, Cancer registry, non-communicable diseases etc.), into a common platform or data warehouse.

Interoperability: The ability of different health information systems to work together within, and across organizational boundaries to exchange data, and use the information that has been exchanged. Standards and workflow introduced by the eIDSR developers, should be interoperable with other information systems.

Multi-sectoral Collaboration: It is essential to collaborate with stakeholders such as telecoms companies. This could be in the form of waivers, corporate social responsibility, and partial tax holidays etc. Effective collaboration could accelerate the roll out and coverage of eIDSR. Collaboration with other sectors (e.g., animal and environment), is also key, as this will facilitate the efficient utilization of scarce resources, and the effective and prompt leveraging of the capabilities of various sectors, for better disease prevention and control.

Near real-time approach: Every effort should be made to ensure that the near real-time transfer of information about events, is incorporated into the design and implementation of eIDSR. This should be a long-term goal, and countries will have to start slowly, with planning and developing executed in phases.

One Health: The One Health approach is an innovative strategy encouraging various disciplines to work together to address health, at the human-animal-environment interface. In view of the fact that the majority of emerging and re-emerging infections are often zoonosis, and responsible for large outbreaks in recent times, maintaining a focus on diseases that affect both humans and animals is a worthwhile investment.

Data security: Protection of information is essential in every health information system. Security of data ensures that information is only accessible by authorized personnel who need to take action. It also promotes the ethical handling of data. Measures should be taken to ensure that there are processes for patient privacy.

User-friendly system: The system should ideally be simple enough to be used by staff at all levels. It should be easy to log on, input and receive information. The system should also be flexible, to be able to adapt to the change of disease and events profiles over time.

9.6 eIDSR development and implementation process

Developing an eIDSR system should be carefully planned, with the involvement of all relevant stakeholders. The system should fit the capabilities and needs of the country, and a plan for securing resources should be developed, prior to initiating eIDSR.

The most important considerations for the process of developing and implementing eIDSR are shown below. Depending on the country, more considerations may need to be made. Countries need also to ensure that they are ready to embark on eIDSR, by weighing the costs and benefits, and also assessing the feasibility of eIDSR options in their country.

9.6.1 Process for establishing eIDSR

i. Engage stakeholders and establish technical working group

- The success of eIDSR requires an effective engagement of all relevant stakeholders.
- When initiating an eIDSR system, the epidemiology division should engage with the HIS and IT divisions. These three divisions should bring together all relevant stakeholders in the country to develop a technical working group (TWG), for the coordination of eIDSR implementation. Potential members of the TWG could include national telecommunications service providers, ministries responsible for ICT, laboratory personnel, representatives of other relevant ministries/ institutions, public health informatics experts, mobile phone companies, internet companies, and other partners. This body should also assume the role of resource mobilization.
- eIDSR may need to leverage the ICT capacity provided by other line ministries, especially the Ministry of Information, Communication and Technology (MICT). MoHSS should seek ways to engage with the Office of the Prime Minister (OPM) and (MICT) to ensure that there is appropriate ICT coverage and governance of eHealth.

ii. Assess country IDSR functionality

- IDSR functionality needs to be assessed at all levels, including the political commitment to use ICT as a pivot of development and social transformation. The MoHSS needs to make electronic disease surveillance a priority.

The epidemiology division needs to follow up on the implementation of disease surveillance activities. The appointment of a disease surveillance focal person at district level, is a key strategy in the success of eIDSR implementation.

iii. Determine country capabilities and needs

- A crucial step in the development of an electronic system is to assess the capabilities and infrastructure needs of the country. The eIDSR technical working group or a similar TWG which oversees surveillance activities, should carefully consider the capabilities, infrastructure and resources, against the needs of their surveillance system. WHO has developed a standardized eSurveillance assessment tool which can also be used as a resource tool.

- **Network coverage**
  - Assessing the network capability in the country is a critical step to determine the type of system that can be developed. Internet/mobile network coverage is a key component to consider.
  - **Internet:** number of providers, cost of subscription, internet speeds, internet coverage in all areas of the country, national level connectivity, and district level connectivity.
  - **Mobile:** number of providers, cost of text messaging, cost of phone calls, provider coverage in all areas of the country, distribution of providers by customers, and common operating systems (Android/IOS).
  - Explore alternative sophisticated models to extend connectivity, such as TV white space, and balloon-, drone-, or low-orbiting satellite-based Iinternet connectivity to extend coverage in remote, or hard-to-reach areas. Some of these options can be realised using a public-private partnership.

- **Power supply option**
  - Availability of power supply is a key input for a successful eIDSR. A reliable power supply to suit the needs of the system must be available at the level of implementation.
  - The Directorate of Health Technology and Infrastructure in MoHSS needs to engage the relevant public enterprises through tender process and procedures, for the provision of potential power supply options for each level of the health system, in all geographic areas, e.g., installation of Uninterrupted Power Supply (UPS) connection to the power grid, consistent generator with fuel provision, consistent generator but no fuel provision, inconsistent generator or inconsistent fuel, power banks, or solar power.
  - The MoHSS should also consider seeking alternative models to enable reliable power. Solar panels, for example, could be installed at key government ministries, prioritizing those responsible for managing critical data sets in emergencies, and to district health facilities.

- **Equipment: data capture, data management, data analysis**
  - Equipment is an essential component of eIDSR (laptops,computers, tablets and cellphones). It is important to assess the equipment available for eIDSR at each level of the health system up to the community level. If the equipment is not yet available, consider the feasibility of the use options for each type of equipment.
  - Consider the lifecycle of all hardware, and ensure the development of a plan for replacing/renewing as needed.

- **Hardware**
  - Consider how to address the housing of data on servers. Servers could be cloud-based, (easier maintenance but monthly/yearly payment), and also consider where they will be housed, i.e., physical infrastructure (requires cool room with consistent power), and potential costs, including initial/setup and ongoing.
  - Consider the types of computers required and how many are needed. Note that desktop computers are cheaper but must have power, laptops are portable, but expensive, and tablets are portable and convenient.

- Consider the types of mobile devices required, including smart phones.
- Consider the availability of power, and how you will ensure an uninterrupted power supply.

- **Software for surveillance or similar function**
  - Is there already software used for other surveillance in the country that could be leveraged?
  - Is there a need to develop other software? The MoHSS should consider open source software that can be customized, or commercial off-the-shelf software.
  - Partnerships between system developers are key in developing software which could be flexible, and easily adaptable.
  - Have a good back-up system.

- **Devices**
  - Are there already mobile devices in the districts e.g., Smart phones or tablets?

- **Human resources: technical capacity**
  - The MoHSS will need a pool of available software developers (government and stakeholders), to be able to support open source systems.
  - Staff using the electronic system that is developed need to be computer-literate..
  - There might be a need to train and retrain staff on the use of systems, as technology evolves (continued education).
  -

iv. Availability of partnerships

- Public-private partnerships with telecom operators should be explored jointly with the ministries responsible for ICTs and telecoms, to support eIDSR systems.
- Investigate whether there are any existing partnerships available for implementing eIDSR.

v. Determine appropriate scope of eIDSR implementation, including One Health approach

- Based on the assessments above, MoHSS should determine the scope of implementing the eIDSR i.e., alert notification, case-based reporting, routine weekly reporting, routine monthly reporting, outbreak/emergency management. MoHSS can start with any approach that fits their needs and capacity at the time, and later add on other functions. Obtain estimates for initial investments and ongoing costs.
- MoHSS should determine potential investors.

vi. Roll out the eIDSR plan

- Develop and launch a country-specific eIDSR implementation plan.
- Develop annual operational plan (timelines, costs, responsibilities) and long-term (5 years) national eSurveillance plan, in the framework of existing integrated health plan(s).
- Consider a step-wise incremental process in implementing the plan and training.
- Incorporate routine monitoring and regular evaluations, including an initial baseline assessment prior to implementation.

9.6.2 Important considerations for a successful eIDSR

The following are considered important considerations for successful implementation of eIDSR in a country:

a. **Laboratory integration**
   - System should link with lab data, or have the ability to link to lab data in the future.

a. b. **Data Privacy and use of a unique identifier (ID number)**
   - Data collection with patient identifiable variables must go to a secured server.
   - Access to data should be controlled through user access rights.

a. c. **Data security and user agreements policies**
   - There should be clear guidelines on how to access the data.
   - There should be scheduled data backups, both local and remote.
   - The physical data storage devices should be secure and locked.

a. d. **IT System Maintenance**
   - Consider software upgrades, hardware upkeep or replacement, and server maintenance if in-house.

a. e. **Sustainability**
   - In order to ensure sustained support of the eIDSR programme, a sustained financial base will need to be established to account for once-off and routine costs such as hardware system maintenance, training of personnel, connectivity costs, and end user materials e.g., IEC.
   - There should be local capacity to maintain both software and hardware.
   - There should be adequate resources to support operational infrastructure.
   - There should be enough resources to support capital investments, such as mobile devices, computers and associated operational costs.
   - eIDSR should be anchored within national eHealth policy and strategy.
   - From the beginning, involve stakeholders in the design and implementation stage, including private companies and telecom companies.
   - Advocate for domestic financial resource allocation and innovative financial solutions, including leveraging resources from stakeholders and telecommunication service providers.

a. f. **Interoperability**
   - Ideally, data can be shared across systems, including surveillance systems from the animal and other relevant sectors.

9.6.3 Potential available tools for eIDSR

Namibia uses Open Source tools such as DHIS2 and Open Data Kit (ODK) for data collection and aggregation. In considering the use of commercial software, MoHSS should ensure that there is a budget for licensing costs. Negotiate with the supplier to provide enhancements or adaptations. It is important to note that Open Source does not mean free, as there are always implementation and customization costs to fit the country's specific context and needs.

9.7 Use of eIDSR in core surveillance functions

There are many components that will ensure the 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 the human and animal surveillance systems.

The use of e-tools for conducting Data Quality Assessment/Assurance (DQA) is also part of a monitoring and evaluation strategy of IDSR functions, which can be used for continuous improvement of the quality of data. Such tools can identify errors, inconsistencies and other data anomalies which ensures that data is reliable, accurate, precise and complete.

The establishment of an electronic platform can facilitate the implementation of the following IDSR activities, as described in previous sections of this document:

a. Real-time reporting (indicator and event-based surveillance)

See Introduction Section.

b. Alert notification (community and health facility reporting

See Section 2.

c. Case-based reporting

See Section 2.

d. Routine reporting (weekly aggregates) and routine monthly reporting (Figure 9.1 on page 384, illustrates how information flows in an eIDSR system)

See Section 2.

e. Outbreak/emergency management

See Section 4 and 6.

f. Case investigation

See Section 6.

g. Contact tracing

See Section 6.

h. Logistics and supply chain management

See Section 6.

i. Real time outbreak line listing

See Section 4 and 6.

j. Event management (hazard description, characterization, risk assessment and outcomes)

See Section 6.

k. Information Products, i.e., Situation Reports (SITREPS), Epidemiological Bulletin, etc

See Section 7.

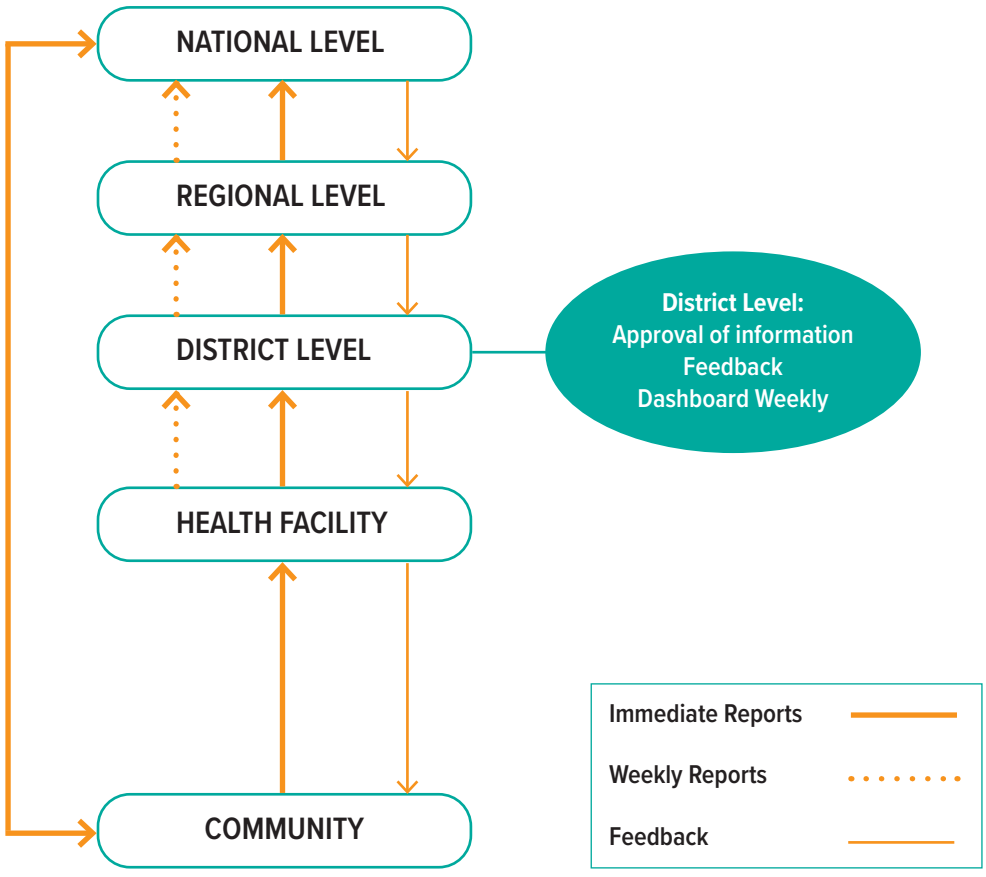
l. Supportive supervision

See Section 8.

m. Monitoring and Evaluation and Data Quality Assessment (DQA)

See Section 8.

Figure 9.1: Information flow for eIDSR



9.8 Roles and responsibilities at different levels, in the context of real-time report and outbreak/emergency management

The roles at different levels should be complemented by the specific functions, as described in the relevant sections.

- **Community level**
  - Provide information on diseases, events, conditions and other hazards, through toll-free helplines, telephone etc.; and
  - Act on alert message sent from health authorities.

- **Health facility level**
  - Depending on the eIDSR platform, report events requiring immediate action.;
  - Submit weekly IDSR reports;
  - Follow-up on events that are reported by community;
  - Act on notifications, and respond as recommended for their area of jurisdiction;
  - Ensure compatibility of eIDSR with their mobile phones or tablets with the; and
  - Ensure maintenance and ownership of mobile phones or tablets, and other tools.

- **District level**
  - Provide staff access to the eIDSR;
  - Verify and approve onward transmission of reported events from lower health facilities;
  - Issue alerts to other facilities and leaders, regarding events within the district;
  - Provide feedback to the reporting health facility regarding the event;
  - Update the staff at health facilities, as well as community leaders regarding progress in the response;
  - Training, mentorship and supervision of healthcare workers;
  - Mobilization of resources to support effective implementation of eIDSR; and
  - Ensure availability and compatibility of ICT equipment with the eIDSR.

- **Regional level**
  - Training and support supervision;
  - Monitoring and evaluation;
  - Collaborate with national level to develop and update electronic tools; and
  - Issue alerts to districts.

- **National level**
  - Maintaining the server;
  - Developing and updating electronic tools;
  - Managing the eIDSR system, including troubleshooting;
  - Maintaining system administration (registration of health staff using server);
  - Training and support supervision;
  - Providing feedback;
  - Issuing alert notifications to regions and other countries;
  - Monitoring alerts;
  - Coordinating partners and stakeholders;
  - Ensuring linkage with other platforms, to facilitate interoperability;
  - Advocating to policy makers, and mobilizing resources to sustain the system;
  - Ensuring data security;

- Overseeing the development and implementation of a national eHealth/digital health strategy;
- Aligning eIDSR investments, and working with the national ehealth/digital health strategy;
- Country eHealth/digital health architecture, with consideration for re-usable components; and
- System governance.

- **WHO and other regional bodies (AU, ECSA, SADC, etc.)**
  - Facilitate creation of a formal platform for sharing information and data across countries;
  - Technical assistance to member states; and
  - Share best practices and facilitate exchange of expertise.

9.9 Supervision, Monitoring and Evaluation

eIDSR development and implementation requires constant monitoring. This is very important during the initial system development and implementation phase. System functionality can be evaluated by looking at issues like:

a. Acceptability or willingness to participate, i.e., number of people who are accessing and use the system correctly.
b. Accessibility: is the system accessible from the place where the reporting site is situated. In some areas where mobile phones are used for eIDSR, network coverage is an important aspect, and this can affect the reporting of diseases on time.
c. Data quality and completeness. Check if there are 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 provide regular feedback of information to the lower levels; information flow should be multi-directional.

Other system performance indicators include the core surveillance indicators for monitoring IDSR. See Section 8.

The IDSR support supervision checklist shall be used during support supervisory visits, while considering the integrated needs from other teams in terms of joint supervision. The Supportive Supervision Checklist has to be updated to incorporate eIDSR, and uploaded as part of the eIDSR platform. The overall evaluation of the eIDSR system and its interoperability with the HMIS and eHealth system should be done periodically, using a blend of internal and external experts.

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SECTION 10

TAILORING IDSR TO EMERGENCY OR FRAGILE HEALTH SYSTEM CONTEXTS

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SECTION 10: TAILORING IDSR TO EMERGENCY OR FRAGILE HEALTH SYSTEM CONTEXTS

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10. Introduction

Humanitarian emergencies have major implications on the populations where they occur and on their health services, including surveillance systems (WHO, 2012). Examples of such humanitarian emergencies include: armed conflict, famine, natural disasters and other major emergencies. These 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.

Effective public health surveillance and outbreak response in affected populations is consequently a priority during public health emergencies. Due to the disruption of health and other social services during the emergencies, the routine IDSR system needs to be enhanced to meet the public health surveillance and outbreak response needs in humanitarian contexts.

In these settings, an enhanced IDSR system should be established to address the humanitarian emergency. This should be based on the existing IDSR strategy, structures, tools, guidelines and resources, while ensuring the flexibility required in addressing the surveillance and response needs of affected populations in emergency situations.

This section introduces the key principles of implementing IDSR in complex humanitarian emergencies. It involves enhancing the core functions of IDSR, 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) for more information.

10.1 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. The routine IDSR system may be underperforming or disrupted. Thus, there is a need to tailor the IDSR to adequately meet the surveillance information needs of a humanitarian emergency.

10.1.1 Key definitions in emergency contexts

10.1.1.1 Disaster

The Disaster Risk Management Act of 2012 (Act No 10 of 2012) defines a disater as any serious disruption of the functioning of a community or society, posing a significant, widespread threat to human life, health, property or the environment, which exceeds the ability of the affected community or society to cope using its own resources resulting from:

a. natural disaster, major accident or other significant events howsoever caused;
b. destruction or pollution;
c. scarcity of essential supplies;
d. disruption of essential services;
e. influx of refugees;
f. plague or epidemic of diseases; or
g. economic failure.

10.1.1.2 Humanitarian emergency

A situation where the basic human needs of a population are threatened, and which requires extra-ordinary measures and urgent action (ReliefWeb, 2008).

10.1.1.3 Complex emergency

A humanitarian crisis in when there is 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 (ReliefWeb, 2008).

10.2 Early Warning and Response (EWAR)

Early warning is an organized mechanism used 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, either from functional static or mobile health facilities/clinics, that are responsible for the collection, investigation, reporting, analysis and dissemination of information, from the field to the national level for appropriate action.

10.2.1 Why is it needed?

The enhanced surveillance needs during humanitarian emergencies demand that surveillance systems are in place for the systematic collection, collation, analysis, and interpretation of data, and dissemination of information to facilitate a public health response, and 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. The existing IDSR should therefore be enhanced within 3 to 10 days of the grading of the public health emergency, to facilitate the rapid detection and response to disease outbreaks and public health events (WHO, 2009). The overall aim during humanitarian crises is to reduce avoidable mortality, morbidity, and disability. (WHO, 2009b), and tailoring the IDSR to the specific emergency context contributes to this goal.

10.2.2 What are 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 prioritized health risks. The aim is to increase the sensitivity of detection, quality of risk assessment, and the timeliness and effectiveness of the response to acute public health risks, in order to minimize the negative health consequences on the affected population.

The specific objectives are to:

- Detec acute public health events and health risks;
- Ensure the immediate communication of information from local and intermediate levels to national levels, as well as from any source identified at the national level;
- Verify the initial information (i.e., alert);

- Document the nature of the event through investigation, characterization, and etiological confirmation;
- Perform a risk assessment to determine the level of risk posed by the detected event;
- Activate immediate alert mechanisms from national and/or regional levels to local levels, including the community;
- Ensure prompt investigation as necessary, and implement an adequate response through mitigation and control measures, as required by the continuous risk assessment; and
- Alert and maintain communication/coordination with national/international stakeholders.

10.2.3 Critical components

During humanitarian crises, all functional fixed and mobile health facilities/clinics, including Internally Displaced Persons (IDP)/refugee camp clinics that provide curative, disease prevention 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, data collection and analysis processes need to be systematized and formalized. Epidemic intelligence should be based on the two main IDSR event detection systems, namely: IBS (immediate and weekly reporting of data aggregated by health facilities), and EBS, 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 capacity of IDSR to ensure the timely detection and verification of outbreaks, and effective monitoring of morbidity patterns (WHO, 2012)

10.3 Implementation of IDSR in humanitarian emergencies

10.3.1 Rapid assessment of the situation

During the acute phase of the emergency a systematic assessment of the risk of acute public health events should be conducted. 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 also determine the geographical scope of the necessary surveillance.

The status of key surveillance infrastructure needs to be assessed, including existing surveillance capacity, identification of resource needs for IDSR implementation, as well as staff with relevant skills, communication and IT equipment, laboratory support, and transport. The assessment should be based on consensus-building, analysis of existing data, establishment of working groups, and conducting 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.

10.3.2 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 to review the strengths, weaknesses, threats and opportunities around the existing national surveillance system, in order to identify any 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 for the gap analysis. If all of the information is not available, focus groups or in-depth interviews with stakeholders at all levels of the surveillance system could be considered.

10.3.3 Prioritization

In order to ensure the most efficient use of resources, the strategy should be based on a prioritization 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 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.

10.3.4 Development of a plan of action for the implementation of IDSR

Once the prioritization exercise has been completed and all potential sources of information listed, a plan of action should be developed and implemented at the national, regional, district and community levels. The plan of action should be well integrated with the national IDSR system, including monitoring and evaluation.

10.3.5 Designate a coordination mechanism

A coordination structure should be established at the national, regional, district, and community levels to ensure a single entry point for reporting, analysis and triaging information, verifying alerts, assessing risks, monitoring, and responding to acute public health events.

10.4 Various actors in enhancing IDSR to improve early warning and response

During acute or complex emergencies, where the capacity of the national, regional and district IDSR system in the MoHSS is greatly constrained, the roles and responsibilities of various actors may need to be reinforced.

10.4.1 National level

The overall coordination of data collection, entry, analysis and dissemination during humanitarian crises should be undertaken by the Epidemiology Division within the MoHSS, with support from WHO and other partners, and fed as necessary, to the PHEOC. The IMS, coordinated by PHEMC, is activated to support coordination and response activities in the affected regions and districts. However, during acute crises or complex emergencies where the capacity of the national Disease Surveillance Sub-division in the MoHSS 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 MoHSS 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:

- Dedicated technical oversight;
- Coordinate the supervision of surveillance and outbreak response activities in crisis affected areas;
- Guide coordination of health workers and partners, for effective disease surveillance and outbreak/public health response in crisis affected populations;
- Support regions and districts to investigate and respond to outbreaks or public health events, including reorientation of staff in IDSR;

- Conduct regular analysis of epidemiological trends, and production of regular surveillance bulletins and situation reports;
- Provide aids for reporting and notifying priority diseases, conditions and events; and
- Support evaluation.

10.4.2 Regional/District level

The existing IDSR focal person at regional and district level should coordinate surveillance and response activities in crisis-affected populations. However, during acute crises or complex emergencies where the capacities of district, regional or national surveillance focal points are constrained, the WHO country office, working in close collaboration with the health cluster, should assign a coordinator /personnel in each affected regional/district to:

- Coordinate disease surveillance and outbreak response in crisis-affected populations;
- Ensure timely reporting of priority diseases, conditions and events related to the crisis;
- Conduct trend analyses and provide feedback to affected health facilities;
- Conduct initial investigation of disease outbreaks and public health events; and
- Respond to disease outbreaks and public health emergencies, in collaboration with national MoHSS staff, stakeholders, and local health facilities.

10.4.3 Public, private and partner-supported health facilities or clinics

All healthcare workers working in health facilities or mobile clinics, offering curative, preventive, and health promotion services, should implement the following:

- Detect, collect and report priority diseases, conditions and events;
- Support the verification and investigation of outbreaks and public health events; and
- Implement public health and outbreak response measures, with support from the community health workers, district, regional and national surveillance focal person.

10.5 Key structures and tools to be put in place during an acute humanitarian crisis

10.5.1 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 prioritised in addition to the national IDSR priority list. In identifying additional priority diseases, conditions and events, criteria for inclusion should take into account the WHO guidelines for inclusion of an event under a surveillance system (WHO, 2012), namely:

- Epidemic;
- Vaccine-preventable diseases, due to disruption of immunization in most of the outbreaks/emergencies;
- Ability to cause severe morbidity or death;
- International surveillance requirements (IHR, 2005);
- Availability of prevention and control measures; and
- 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:

- Outpatient registers;
- Inpatient registers;
- Laboratory results reports;
- Outreach/mobile clinics in the community, or from focal people identified from the community;
- IDP/refugee camp clinic registers; and
- Other sources of event-based information.

10.5.2 Case definitions

For the diseases, conditions, and events already included in 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.

10.5.3 Laboratory support

Quality-assured, WHO approved, Point of Care Rapid Diagnostic Test kits (RDT), for diseases like Malaria, COVID-19, Cholera, Meningitis, and Hepatitis A and E 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 the timely investigation of new outbreaks:

- Adequate stocks of outbreak supplies, and sample collection kits/SOPs at the district level;
- Cold chain and shipping arrangements that are linked to the national specimen transportation network;
- Establishing field or mobile laboratories to address the routine and outbreak laboratory testing needs of crisis affected populations;
- Strengthening existing laboratories at central and district levels to address the extra demands of crisis-affected populations;
- Referral laboratories (central and international) should be identified to facilitate laboratory confirmation, antibiotic susceptibility testing, genomic sequencing and quality control;
- The existing laboratory and case investigation forms should be used for routine collection and reporting of laboratory aggregate and case-based data; and
- Harmonization of laboratory reporting between surveillance and laboratory systems for timely dissemination of results.

10.5.4 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, outreach 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:

Strict adherence to the case definitions while collecting disease, conditions or event data;
Each patient should be assigned one main diagnosis and counted once; and
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:

- Health Information System (HIS) outpatient and inpatient registers;
- IDSR Weekly Summary Reporting form;
- IDSR health facility alert/rumour logbook;
- Disease-specific line lists;
- Disease-specific case investigation forms;
- DHIS2;
- GoData;
- Other case-based databases such as AFP, Measles and NNT; and
- ODK.

10.5.5 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/HIS reporting tools to capture diseases, conditions, and events unique to crisis affected populations. Consequently, the existing IDSR/HIS paper- based tools and/or electronic reporting platforms should be updated to capture the additional diseases, condition, and public health events that are unique to crisis-affected populations.

The reporting platforms (paper-based and/or electronic) should provide for the following reporting timelines:

- Immediate reporting of epidemic-prone disease alerts;
- 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; and
- Weekly reporting of aggregated data on priority diseases.

10.5.6 Data analysis and interpretation

The principles of data analysis utilized as part of the routine IDSR should also be used in crisis-affected populations. Analysis of the aggregated data allows for the documentation and description of 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:

- Absolute counts of cases and deaths by priority disease;
- 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;

- Proportional morbidity (new cases of disease in a week, divided by the new consultations in the week);
- Case Fatality Ratio (CFR) – the proportion of cases that die from a specific disease; and
- 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 5 years Mortality Rate (U5MR)) are monitored for crisis-affected populations, to ensure that rates exceeding the established emergency threshold are detected and responded to promptly.

- 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.
- 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.

10.5.7 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 any feedback. Weekly surveillance summaries, bulletins, and presentations should be presented and reviewed during:

- District Coordination Committee (DCC) meetings;
- District Public Health Emergency Management Committee (DPHEMC) meetings; and
- Outbreaks, with compilation of regular situation reports.

The existing electronic platforms offer the advantage of producing automated disease surveillance and epidemic bulletins, or situation reports to inform decision making at all levels, on disease surveillance and outbreak response.

10.5.8 Support functions for surveillance in crisis-affected populations

To optimize the functioning of disease surveillance and outbreak response in crisis-affected populations, IDSR guidelines are adapted and used to improve access to the following:

- Surveillance and outbreak response guidelines at all levels;
- Training of health workers, surveillance focal persons or points, and rapid response teams on surveillance functions including outbreak preparedness, investigation, and response;
- Communication support (computers, phones, internet connectivity), based on local context and surveillance needs;
- Regular supervision and support to enhance surveillance functions at all levels; and
- Periodic evaluation to improve the performance of the surveillance system (refer to framework for evaluating surveillance systems).

10.5.9 Outbreak preparedness

Outbreak preparedness is paramount given the heightened risk of disease outbreaks in crisis-affected populations. Preparedness efforts should be integrated in the existing national IDSR framework, at national and regional levels with the MoHSS leading the efforts, and supported by WHO and other partners. However, during acute or complex emergencies where the capacities of the MoHSS are greatly compromised or diminished, WHO working with the health cluster partners, should take the lead in enhancing outbreak preparedness (WHO, 2012). Key preparedness efforts in crisis-affected populations includes the following:

- Strengthening the existing multi-sectoral outbreak control teams, or forming new ones, at national and regional levels, with roles and responsibilities designated for each team member;
- Updating existing outbreak prevention and response plans, or developing new plans, that incorporate the risks unique to crisis-affected populations;
- Developing or updating (if necessary), standard line-list forms for data collection during an outbreak;
- Developing and distributing SOPs, and standard treatment protocols for key diseases, with strategies for training of staff;
- Calculating potential attack rates for epidemic-prone diseases, where possible;
- Pre-positioning stocks of essential treatment supplies to initiate outbreak control (e.g., oral rehydration solutions, intravenous fluids, vaccination supplies, 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;
- Procurement of laboratory sample collection supplies for the priority diseases, and identification of accredited for confirmation of cases;
- Identifiying o potential sites for isolation and adequate treatment of patients, or for extra capacity in the event of a surge in cases (e.g., Cholera treatment centre);
- Implementing the 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 outbreaks of Measles, Cholera, and Malaria); and
- Accelerating preparedness and response efforts/ activating rapid response teams at the points of entry (PoE).

10.5.9.1 Alert and epidemic thresholds

The following thresholds are used in crisis-affected populations:

- Assess the severity of the humanitarian crisis based on the CMR and U5MR:
  - The CMR threshold should be less than 1 death per 10,000 people per day; and
  - The U5MR threshold should be less than 2 deaths per 10,000 people per day.
- Alert system for detecting possible outbreaks, based on doubling of weekly incidence compared to the weekly average of previous 2 - 3 weeks; and
- 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, verification, investigation, and response should be instituted promptly to prevent further morbidity and mortality.

10.5.9.2 Alert verification

To minimize morbidity and mortality, alert verification should start immediately once the alert is received by district, regional and national surveillance focal persons. The verification can be done by telephone, email or site visit, and can include the collection of information about:

- Cases based on Standard Case Definitions (SCDs);
- Symptoms and signs (consider differential diagnoses);
- Date of onset of symptoms of the first, and the most recently detected cases;
- Place and date seen, or admitted at the health facility;
- Age, sex and vaccination status of patients, where relevant;
- Place of residence at onset of illness;
- Where cases are occurring (community-level data);
- Geographical, personal and time relationships between cases;
- Prompt laboratory investigation of samples from suspected cases; and
- Outcomes, including for example, deaths, case management details, and the health workers affected.

10.5.10 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 district, regional and 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. The investigations should follow existing IDSR outbreak investigation, and/or revised, or newly-developed guidelines that have been adapted to address the unique needs of crisis-affected populations.

10.5.11 Outbreak response

Outbreak response should follow the existing national IDSR framework at national, regional, and district levels, with the country's existing structures leading the efforts. However, during acute or complex emergencies where the capacities of MoHSS are greatly compromised or diminished, WHO working with the health cluster partners, should take the lead in coordinating and implementing outbreak response activities.

The additional risks in crisis-affected populations will demand strengthening existing multi-sectoral outbreak control teams, or forming new teams at the national, regional and district 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.

10.6 Exit strategy

During the recovery phase of the crisis, MoHSS should work with WHO and relevant partners to re-establish all the surveillance structures and focal points in the crisis-affected populations. The MoHSS should conduct an evaluation to assess what happened, why it happened, and adequately document lessons learned and gaps identified. This information is used to draft recommendations aimed at preventing future emergencies.

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