REPUBLIC OF KENYA
MINISTRY OF HEALTH

TECHNICAL GUIDELINES FOR

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE



INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES FOR THE REPUBLIC OF KENYA



THIRD EDITION

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FOREWORD

In 1998, the World Health Organization (WHO) Regional Office for Africa (AFRO), together with its technical partners, adopted a strategy for developing and implementing comprehensive public health surveillance and response systems in African countries, initially called Integrated Disease Surveillance. However, to highlight the linkage between surveillance and response, the strategy was later renamed Integrated Disease Surveillance and Response (IDSR).

The first edition of the IDSR technical guidelines (2002) was widely adopted by Member States. The progress towards a coordinated, integrated surveillance system has been achieved at the country level by Government and partners investing in technical and financial resources such as strengthening human resources, innovations in data management and logistics for preparedness and response. In an effort to build capacities for public health surveillance systems for early detection, confirmation, and response to public health threats, to prevent death, disability and illness.

The International Health Regulations (IHR 2005) came into force in 2007. The emergence of new diseases, conditions, and events, and the formulation of strategies for Disaster Risk Management (DRM) resulted in the need to revise the first edition of the IDSR guidelines. There was also a need to address the increasing burden of non-communicable diseases. Community-based surveillance for early detection, rapid confirmation, and response to public health threats remains the main stay of IDSR.

The second edition of the IDSR Technical Guidelines was developed in 2010 in response to several factors relevant to the preceding decade. The purpose of the revision was to update existing information, include other priority diseases, conditions and public health events and incorporate aspects of the international Health Regulations (IHR) that deal with disease surveillance.

The Third edition of IDSR technical guidelines has been revised by WHO AFRO for member states including our county to adapt. The revision was necessitated by challenges noted from implementation of 2nd edition in public health surveillance systems which hindered the capacity to prevent, detect, and respond to public health threats. For example, Ebola Virus Disease (EVD) outbreak in 2014 in West Africa, and other recent health emergencies have shown that the IHR (2005) has not been fully implemented to address disease outbreaks and other public health emergencies therefore remains a major challenge.

In Kenya the adaptation process has taken into perspective of the gaps noticed during the implementation of the second edition, emerging and re-emerging diseases including Rift Valley Fever, Dengue, Chikungunya, Polio, Ebola, Marburg and the current pandemic of SARS COV2 (COVID-19) called for urgent adaptation of the guidelines. The country has revised its priority disease list increasing it from 36 to 42. These guidelines recommend thresholds for action on priority diseases, public health events, and conditions and for responding to alerts. Using these action thresholds can be lifesaving. I therefore urge all Counties to fully implement this third edition of the IDSR guidelines everywhere in the country because they explicitly describe what

needs to be established at each level of the health system in order to detect, confirm, and respond to diseases/health events that are responsible for all preventable deaths, disabilities and illnesses in local communities.

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

The cost of good public health surveillance as a public health good is relatively very low compared to many other strategies. I appeal to all Member States, national, County and international partners and funders that we should begin the hard work now. Let us all embrace these IDSR technical guidelines to strengthen capacities for preparedness, alert, and response for health security in every County.

Finally, I appeal to you all to ensure that the third edition of the IDSR guidelines are implemented within the broader context of health system strengthening; better coordination between human and animal health surveillance and other sectors involved in the One Health approach; invest in laboratory capacity and maximize the available laboratory facilities for surveillance and response activities. Improve Collaboration in research and better community engagement in public health interventions for future.

Hon. Sen. Mutahi Kagwe EGH

Cabinet Secretary

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Executive summary

The Division of Diseases Surveillance and Response is mandated to oversee and implement surveillance and response to events of public health importance. This is in line with the strategic focus of the Kenya Health Policy 2014–2030 and the Kenya Vision 2030 to transform the country into a globally competitive and prosperous nation with a high quality of life by 2030. This Third Edition of the IDSR Technical Guidelines shall provide reference point for all surveillance activities in the republic. The guidelines aim at effective and efficient epidemic preparedness, detection, and response.

These guidelines were developed through a consultative process involving a wide range of stakeholders from national and county governments, non-governmental institutions, and development partners. The overall goal of the guidelines is to build the capacity of the DDSR towards excellence in prediction, preparedness, early detection, and efficient response to events of public health importance. These guidelines have been divided into the following sections:
Introduction Section
Section 1: Identify and record diseases conditions and events
Section 2: Report priority diseases, conditions and events
Section 3: Analyze 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 other public health events
Section 7: Risk communication
Section 8: Monitor, evaluate, supervise and provide feedback to improve surveillance and Response
Section 9: Electronic Integrated Disease Surveillance and Response
Section 10: Tailoring IDSR to emergency or fragile health system contexts
Section 11: Disease specific guidelines
We are confident that these will propel the country towards the attainment of vision 2030 and the health component of the big four agenda. I urge all stakeholders to support the implementation of these technical guidelines.

Dr. Patrick Amoth, EBS

Ag. Director General

Ministry of Health

Adaptation Process of the 3rd Edition of IDSR Technical Guidelines

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

The purpose for revising these IDSR technical guidelines was to:

- align with the current situation and needs of the member states;
- align with the objectives, targets and elements of the WHO Africa region's strategy for health security and emergencies 2016 to 2020;
- update the technical guidelines with contemporary information, taking into consideration new developments such as: emerging and re-emerging priority diseases, conditions and events;
- incorporate recent recommendations from expert panels on strengthening the IHR 2005 that are underpinned on the One Health approach;
- holistically address Disaster Risk Management (DRM) strategies;
- take into account lessons learnt from the unprecedented EVD outbreak in West Africa, polio eradication and other humanitarian crises;
- Take advantage of technology advancement and utilize the opportunities offered by the internet and mobile phones to scale up the implementation of real time Community Event-Based Surveillance (CEBS), with robust Geographical Information System (GIS) platforms;
- scale up other electronic surveillance systems and incorporate new ways for capacity building using the IDSR eLearning tools

In planning to update these guidelines, suggestions and advice for improving the recommendations were sought and gratefully received from the IDSR development teams who prepared the 1st and 2nd editions. This revision builds on the technical expertise from more than 30 surveillance and disease experts at the Division of Disease Surveillance and Response at the Ministry of Health, Kenya who adapted the 1st and 2nd editions.

The revision process involved internal MOH consultation followed by a wider consultation that involved a series of meetings with various partners. In addition, the IDSR task force was constituted to help with the revision process. The final draft was peer reviewed by the ad hoc task force as well as during a final partner consultative meeting.

ABBREVIATIONS AND ACRONYMS

AAR	After Action Review
AEFI	Adverse Events Following Immunization
AFP	Acute Flaccid Paralysis
AFRO	WHO Country Office for Africa
AWD	Acute Watery Diarrhea
CBIS	Community Based Indicator Surveillance
CBS	Community Based Surveillance
CDC	Centers for Disease Control and Prevention
CDH	County Director of Health
CDSC	County Disease Surveillance Coordinator
CEBS	Community Event Based Surveillance
CFR	Case Fatality Rate
CHA	Community Health Assistants
CHMT	County Health Management Team
CHS	Community Health Services
CHSS	Community Health Services Supervisor
CHMT	County Health Management Team
CHV	Community Health Volunteer
CMLT	County Medical Laboratory Technologist
CDSC	County Disease Surveillance Coordinator
DRM	Disaster Risk Management
EBS	Event Based Surveillance
eDEWS	Electronic Disease Early Warning System
EOC	Emergency Operations Center
EPI	Expanded Program on Immunization
EPR	Epidemic Preparedness and Response
EVD	Ebola Virus Disease
HCF	Healthcare Facility

HCW	Health Care worker
HF	Health facility
HIV/AIDS	Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome
HMERU	Health Monitoring and Evaluation and Research Unit
HMIS	Health Management Information System
HPO	Health Promotion Officer
IBS	Indicator Based Surveillance
IDS	Integrated Disease Surveillance
IDSR	Integrated Diseases Surveillance and Response
IEC	Information, Education and Communication
IHR	International Health Regulations (2005)
IRC	International Rescue Committee
IMC	International Medical Corps
IMS	Incident Management System
IOM	International Organization for Migration
IPC	Infection Prevention and Control
JEE	Joint External Evaluation
KHIS	Kenya Health Information System
MCH	Maternal Child Health
MDR	Multi Drug Resistance
MEF	Monitoring and Evaluation Framework
MOA	Ministry of Agriculture
MOH	Ministry of Health
MTI	Medical Teams International
NGO	Non-Governmental Organization
NNT	Neonatal Tetanus
OIC	Officer in Charge
PCI	Project Concern International

PHE	Public Health Events
PHEIC	Public Health Event of International Concern
PHEMC	Public Health Emergency Management Committee
PoE	Points of Entry
PPE	Personal protective equipment
RCCE	Risk Communication and Community Engagement
RRT	Rapid response team
RTA	Road Traffic Accident
SARS	Severe Acute Respiratory Syndrome
SCDSC	Sub-County Surveillance Coordinator
SCHMT	Sub-County Health Management Team
SCMLC	Sub-County Medical Laboratory Coordinator
SFP	Surveillance Focal Point
SIMEX	Simulation Exercise
STI	Sexually Transmitted Infections
UNICEF	United Nations Children's Emergency Fund
VHF	Viral Hemorrhagic Fever
WHO	World Health Organization
XDR	Extensively Drug-Resistant

GLOSSARY (DEFINITION OF TERMS)

Term	Definition
Acute	Any disease having a rapid (sudden) onset and following a short course.
Chronic	Any health condition that develops slowly or is of long duration and tends to result in some functional limitation and need for ongoing medical care.
Cluster	An aggregation of cases or health-related conditions in a given area, over a particular period, regardless of whether the number of cases is more than expected in relation to time or place or both.
Diseases	An illness or medical condition, irrespective of origin or source, which presents or could present significant harm to animals, humans and plants.
Disaster	The serious disruption of the functioning of a community or a society, causing widespread human, material, economic or environmental losses exceeding the ability of the affected community or society to cope using its own resources.
Elimination	Reduction to zero (or a very low defined target rate) of new cases in a defined geographical area
Endemic	A disease or condition regularly found among particular people or in a certain area
Epidemic	Refers to an increase in the number of cases of a disease or an event above what is normally expected in that population in a given area over a particular period of time.
Epidemiology	The study of the distribution and determinants of health-related states and the application of this information to controlling public health problems
Epidemiology link	When a patient has or had exposure to a probable or confirmed case
Etiology	Refers to the cause, set of causes, or origin of a disease or condition
Event	Under the IHR (2005) (Article 1), an event is defined as 'a manifestation of disease, or an occurrence that creates a potential for disease' (with particular reference to public health events of international concern (PHEIC)). An emergency incident or occurrence. An event may be insignificant or could be a significant occurrence, planned or unplanned (e.g., extreme weather event or mass gathering), that may impact the safety and security of communities. NB: 'Event' and 'incident' are often used interchangeably
Epi week	Epidemiological week starts from Monday to Sunday, every week
Health Management Information System	A monthly reporting system for diseases, conditions, and risks that is reported to the MOH from every healthcare facility
Human-animal and their environment(s);	A continuum of contacts and interactions among people, animals, their products, in some cases, facilitating transmission of zoonotic environment interface pathogens or shared health threats
Incident	An occurrence or event, natural or human-caused, that requires an emergency response to protect life, property, or the environment. An incident may be geographically confined (for example, within a clearly delineated site or sites) or dispersed (for instance, a widespread power outage or an epidemic). Incidents may start suddenly (for example, a chemical plant explosion) or gradually (a drought). They may be of very short duration (for example, a call for emergency medical assistance), or continue for months or even years. War-related disasters, public health and medical

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

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES FOR KENYA

THIRD EDITION



INTRODUCTION SECTION

May 2022

INTRODUCTION SECTION

A.0 Introduction

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

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

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

A.1 Public Health Surveillance

Public Health Surveillance is the ongoing systematic, collection, collation, analysis, and interpretation of disease occurrence and public health event of public health importance, for the purposes of taking timely and appropriate public health action. Surveillance is essential for planning, implementation, monitoring, and evaluation of public health practice. WHO AFRO recommends the adoption of IDSR strategy and implementation to achieve effective and efficient public health surveillance.

A.1.1 Approaches to public health surveillance

Definition of the different types/approaches of public health surveillance:

a) Passive surveillance: An approach whereby a health system receives routine reports submitted from health facilities, such as hospitals, clinics, laboratories, public health units, the community or other sources. This is the most common form of surveillance, which includes the surveillance of diseases and other public health events as a routine surveillance measure in the cause of routine case management, picked from any other public health information system.

b) Active surveillance: It occurs as an ongoing search for cases in the community or health facilities or DELIBERATE search of persons exposed to any other public health event/hazard. This may involve regular contacts with key reporting sources, by making telephone calls to health care workers at a facility or laboratory or community or physically moving to the source and

carrying out record review of data. Examples include active search for cases of measles and polio, including during outbreaks, where mechanisms must be put in place for active finding of additional cases. During occurrence of no-disease public health events, active case search involves search for additional persons exposed to the event.

c) Integrated Disease Surveillance and Response (IDSR): This is an approach that aims at collecting health data for multiple diseases and public health events, 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: Indicator-based surveillance (IBS); and event-based surveillance (EBS).

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

i) Facility-based surveillance

All reporting units, such as health facilities, are required to report immediately and a weekly to the next level, and based on the categories of the diseases, conditions, and events. Once a suspected outbreak is confirmed, the reporting site line lists additional cases and submits the same regularly as per policy. Additionally, they are also required to report any epidemic-prone disease to the next level immediately.

ii) Case-based surveillance:

This involves collecting in-depth information about a suspect for confirmation. It is the type of surveillance used for diseases targeted for elimination or eradication or suspected outbreaks. In these scenarios, every individual case identified is reported immediately to the next level, using the case-based form.

iii) **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 health events of public health importance, where they 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 include sentinel surveillance for influenza, rotavirus, pediatric bacterial meningitis, and environmental sewage sampling for polio.

iv) Syndromic surveillance

This is an active or passive system that uses Standard Case Definitions, based entirely on clinical features, without any laboratory diagnosis. Examples of these are: collecting the number of cases of Acute Flaccid Paralysis (AFP) as an alert for polio; acute watery diarrhea among people aged two years and older as an alert for cholera; "febrile rash illness" as an alert for measles; acute hemorrhagic fever as an alert for viral hemorrhagic diseases, or severe acute respiratory infection or influenza-like illness as alerts for influenza. Because of the lack of specificity of this system, reports require more investigation from higher levels.

v) Laboratory surveillance

Laboratory surveillance refers to identification of an uncommon pathogen or a pattern of pathogens from tested samples from one or a network of Laboratories, in the cause of routine clinical work, response to epidemics, research or from planned surveillance activities. Laboratory surveillance data can be mined from different laboratory registers that includes: clinical laboratories (Human), veterinary laboratories (livestock and wildlife), research laboratories, Food and water laboratories, radiological, chemical and environmental laboratories.

Laboratory surveillance is continuous, systematic, collection, collation, analysis and interpretation of laboratory data and the dissemination of information to those who need to know so that appropriate action is undertaken in support of epidemic preparedness, Surveillance and Response.

In a clinical set-up, routinely, samples are collected from individuals who develop signs and symptoms of a disease, for laboratory diagnosis. In this process a set of data is collected including the results for the tests done and the possible pathogen associated with the signs and symptom of the diseases. This is the major source of data for laboratory surveillance and applies to human and the animal sector. Trends of pathogens isolated are monitored overtime with close comparison of diseases symptoms and signs in the population.

Laboratory surveillance is dependent upon laboratory results. The laboratory results can be gotten from simple testing techniques to complex ones that include molecular characterization of etiological agents. The laboratories can be at the lowest level or field to sample transportation to central/referral laboratories with advanced capabilities for safety and technologies, in identifying pathogens, typing and genetic characterization.

The laboratory surveillance is paramount in monitoring trends of pathogens, surveillance of change in pathogenicity, antigenicity, molecular properties, as well as anti-microbial resistance patterns. Laboratory is useful in determining cause of an event by analyzing samples or specimens from biopsy or autopsies. The data is analyzed and used in applied laboratory epidemiology to characterize the occurrence of the event by person, place and time.

There are many types and forms of laboratory surveillance. These include; National, sentinel, multiple or single pathogens surveillance. Laboratory surveillance can be modeled as routine or periodic. Activities include, food analysis for toxicology or microbiology, environmental sample

analysis for pathogen e.g., polio, radiological analysis of environment, simplest. Laboratory surveillance is a very useful tool in research.

Laboratory surveillance and response services provide a platform for detection of outbreaks, confirmation, and monitoring mutations of pathogens as in Influenza surveillance to aid in development of vaccines against new strains when detected.

vi) **Disease-specific surveillance**

Disease specific surveillance involves surveillance activities aimed at targeted health data for a specific disease for vertical surveillance. Examples include tuberculosis, malaria and HIV surveillance systems. At most of the time it is used for conducting surveillance for diseases earmarked for eradication, elimination or monitoring a specific disease of public health importance.

vii) Adverse Events Following Immunization Surveillance

Adverse Events Following Immunization (AEFI) is defined as any untoward medical experience which follows immunization and does not necessarily have a causal relationship with the usage of vaccines.

Cases of AEFI occurring at the household level are reported to the health facility at the point of immunization, documentation is done on symptomology and sinology to the next level.

viii) Adverse Events of Special Interest Surveillance

An AESI is a pre-specified medically-significant event that has the potential to be causally associated with a vaccine product that needs to be carefully monitored and confirmed by further special studies (Ref: Monitoring and responding to AESI, Safety surveillance Manual, WHO)

- **Event-based surveillance:** 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 a signal, considered by the early warning and response system as representing a potential risk (such as an outbreak) to human health. All signals may not necessarily become real events, and as such, need to be interrogated and verified before a response is initiated. Signals, which may signify potential risks, include:

i) Occurrence of disease in humans, such as unexplained clustered cases of a disease or syndromes, unusual disease patterns or unexpected deaths, as recognized by community health Volunteers and other key informants in the community;
ii) Events related to potential exposure to humans, such as to diseases and deaths in animals, contaminated food products or water, and environmental hazards, including chemical and radiological events.

iii) Signals of potential exposure of human beings to biological, chemical or radiological and nuclear hazards that may occur as natural or man-made.
iv) Event-based surveillance involves media monitoring, which entails regular scanning of newspapers, internet sites and media alert systems, such as ProMed, blogs, social media, local FM radios, and television.
v) The event-based surveillance system is very sensitive, and information received should be synchronized with IBS and rapidly assessed for the risk the event poses to public health and responded to appropriately. **(Illustrated in Figures 2 and 3).**

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

d) Community-Based Surveillance (CBS): CBS is defined as the detection and systematic reporting of events of community interest or those defined by the health system by community members. CBS incorporates both indicator-based and event-based surveillance methods. Under CBS, community health volunteers (CHVs) report cases or events to the designated community health Assistant (CHA) or focal point at nearby local health delivery points.

Community-based surveillance strategies focus on two approaches to collect community information. The first one relies on identifying and reporting events based on lay case definition (LCD). For example, trusted community members are trained to identify diseases such as measles, cholera, polio and Guinea worm, using lay case definition and use the standardized reporting forms or system to the next level.

The second strategy relies on reporting of unusual events (alerts) to pick and report signals at the early stages of an outbreak or any other public health threat in the community. Signals may capture a wide variety of unusual events emerging at the community level, and information from these signals may be incomplete and unconfirmed and as such, need to be interrogated and verified. Information by this strategy can also come from people who have already been oriented on the agreed lay case definitions, for example, the community health volunteers, or any other representatives from community, who have been trained to detect events, such as unusual animal deaths and report them to the next level. Often, CHV or focal persons would link the patient identified, through any of the strategies, to a nearby health facility using the referral forms. CHVs can as well support in contact tracing for appropriate action to contain the event.



Figure 2: *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 should be captured in the IBS system and reported to the next level of the health care system.

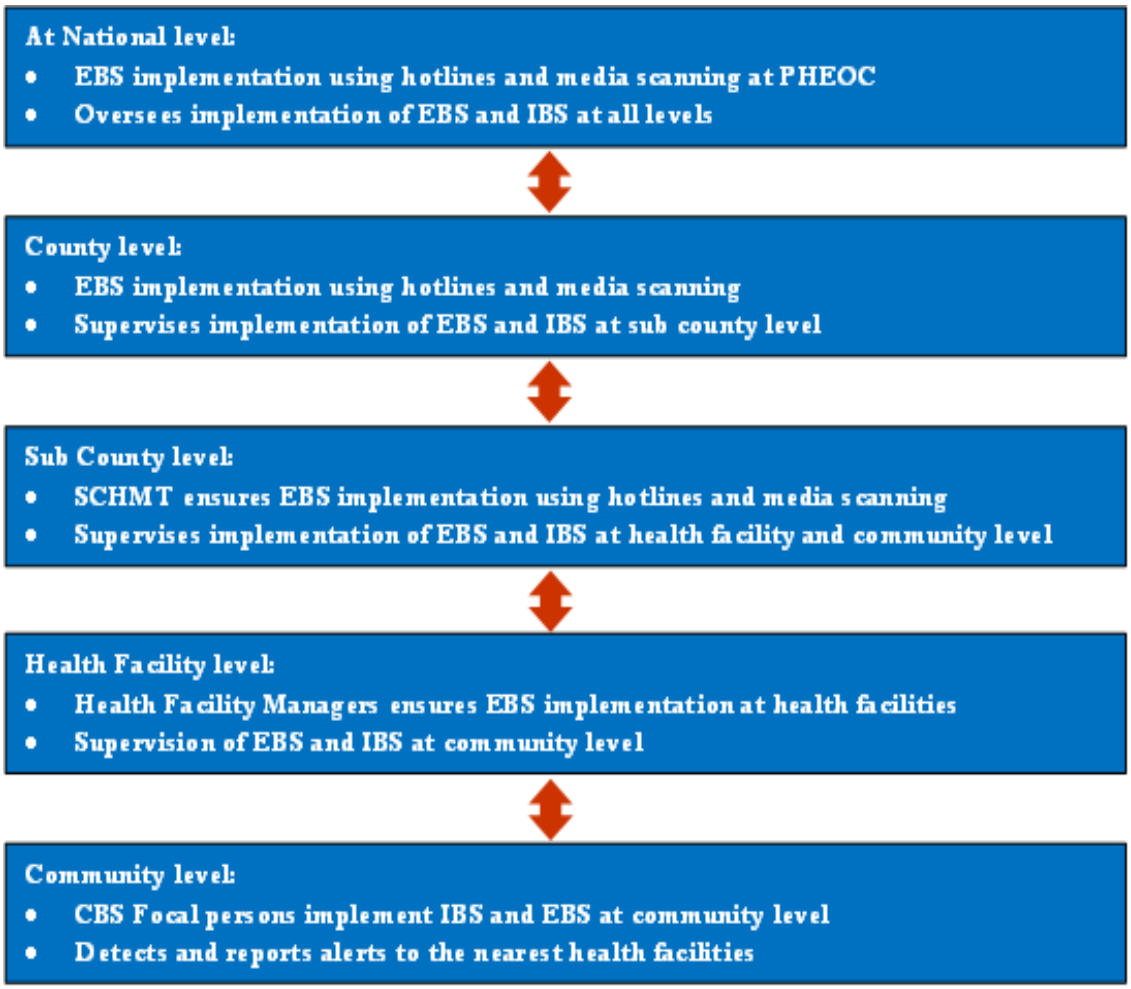


Figure 3: *Levels of application and reporting of EBS and IBS in the context of IDSR*

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

A.2 Integrated Disease Surveillance and Response Strategy

The Integrated Disease Surveillance and Response strategy was adopted by WHO/AFRO Member States in September 1998 as the approach for improving public health surveillance and response for priority diseases, conditions and events at community, health facility, Sub-County, county and national levels. IDSR promotes 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 and helps 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 improvement to the health care system, the IDSR strategy also assists counties to better monitor and track planned time-bound performance targets.

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

What takes place in an integrated surveillance system?

a) Integration is the act of bringing together smaller components into a single system that functions as one. This is therefore, to mean that surveillance activities are integrated into routine health activities under all programs and projects. A central coordination mechanism is developed under multiple levels from the level one to level 6 of healthcare services. Surveillance activities should as well be integrated into other sectors and fields in line with one health concept.

Thus, health workers who routinely visit health facilities for other administrative duties, can undertake surveillance activities e.g., case search in records, support supervision and provision of feedback to the healthcare workers.

The integration maximizes on available resources and skills, while serving the same populations. The integration maximizes on, skills, resources while targeting the same populations. Thus, health workers who routinely visit health facilities for other administrative duties, can undertake surveillance activities e.g., Case search in records, support supervision and provision of feedback to the healthcare workers. County and health facility records for information about other priority diseases in the area. Community focal persons 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 Sub County level is the hub and focus for integrating surveillance functions. It is the first level in the local health system. It has dedicated staff for all aspects of public health, such as planning, supporting implementation of the National Health Strategy Plan, monitoring health events in the health facility and the community, mobilizing community action, seeking assistance at the national

level, and accessing regional resources for protection at the Sub County level. Similar functions also occur at the various administrative levels.

Surveillance focal points at the Sub County 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 sufficient capacity for detecting, confirming and responding to diseases, conditions and events. IDSR ensures that the information flow is bi-directional (horizontal and vertical), so that each level is informed promptly of potential outbreaks and response interventions. Information flow should also reach adjoining communities and sub counties.

b) Coordination refers to working or acting together effectively for the rational and efficient use of available resources. Coordination involves information sharing, joint planning, monitoring and evaluation to provide accurate, consistent and relevant data and information to policy-makers and stakeholders at all administrative levels.

The Division of Diseases Surveillance and Response was established to initiate, facilitate and coordinate surveillance and activate response mechanisms for epidemics, conditions or events of public health importance. Multi-sectoral and multidisciplinary committees are constituted to coordinate response as per arising needs from time to time. **(Refer to section 5)**

A.3 Objectives of Integrated Disease Surveillance and Response

A.3.1 Broad objective

To strengthen surveillance, Epidemic and preparedness and Response to diseases, conditions and public health events in the Country.

A.3.2 Specific objectives:

i) To strengthen detection of diseases, cases, conditions and public health events.
ii) To activate immediate reporting of occurrence of disease, conditions or event of public health importance.
iii) To strengthen laboratory involvement for confirmation.
iv) To build capacity for epidemic preparedness and response.
v) To respond to epidemics, conditions and public health events.
vi) To improve surveillance through supervision, monitoring, evaluation and provide feedback

A.4.0 IDSR and IHR (2005)

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

A.4.1 IHR (2005) Purpose and Goal

International Health Regulation 2005 (Revised) is a legally binding instrument of international law that aims to enforce international collaboration to prevent, protect against a public health response internationally.

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

The scope of IHR has been expanded from three diseases (cholera, plague and yellow fever) to all PHEICs. They include those 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 Sub County level, and ensure continuous and timely provision and use of information for public health decision-making, IDSR provides the following resources for the implementation of IHR (2005):

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

Member States in the African Region recommended that IHR (2005) should be implemented in the context of IDSR. IHR (2005) is therefore not a separate surveillance system, but rather, one that requires countries to put in place a "sensitive, reliable, and flexible surveillance system that meets international standards". IDSR is such a system, which will ensure a reliable supply of information to the national level to fulfil IHR requirements. 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. It also provides an excellent opportunity for strengthening surveillance and response systems and acting as a potent driver for IDSR implementation. IDSR and IHR (2005) share common functions, as described in **Figure 4** below (detection, notification, reporting, verification and confirmation, and timely response).

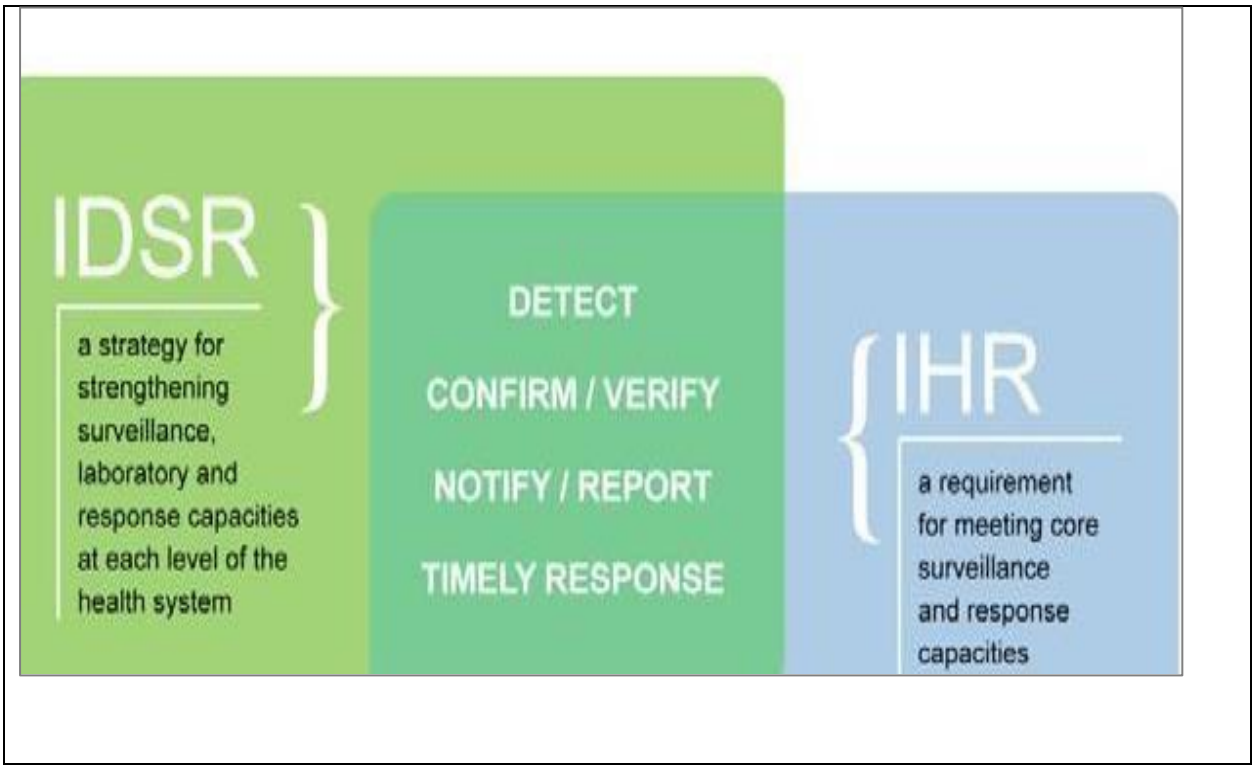


Figure 4: *Implementing IHR through IDSR*

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

The IHR (2005) guidelines have practical implications for IDSR. In the IHR (2005) guidelines, all public health emergencies of international concern should be detected, assessed and responded to promptly, using an adapted response rather than pre-set measures. The IHR (2005) guidelines include the measures at points of entry (airports, ports and ground crossings) and containment at source of public health events. The IHR (2005) guidelines also include capturing rumors 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.

A.4.2 Monitoring and evaluating the functional core capacity for implementation of IHR (2005)

Following the Ebola outbreak experience in 2015, several IHR 2005 review committees and various expert panels recommended the use of additional tools to monitor and evaluate IHR (2005) implementation. Consequently, since 2016, WHO Member States adopted the combined approach to the IHR (2005) monitoring and evaluation process.

The four components of the IHR (2005) monitoring and evaluation framework are:

a) Mandatory annual reporting to the World Health Assembly
b) Joint external evaluation (JEE)
c) After Action Review (AAR)
d) Simulation exercises

The four components highlight a more functional approach to assessing IHR (2005) capacities and foster transparency and mutual accountability. This is illustrated in **Figure 5** below.

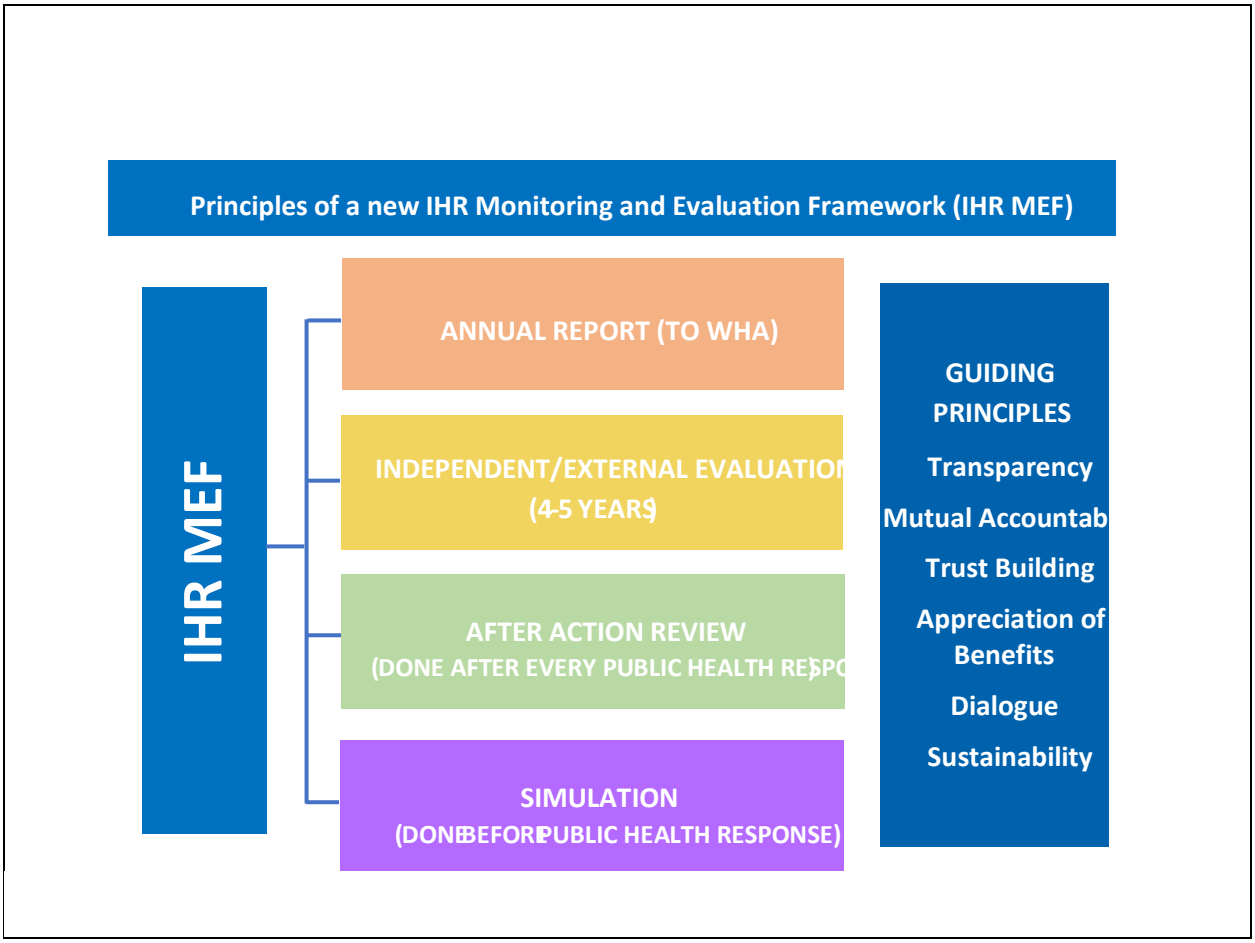


Figure 5: *IHR monitoring and evaluation framework*

A.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 humans and animals alike. The One Health approach applies to the local, regional, national, and global levels. Humans and animals (domestic and wildlife) share the same eco-system and opportunities for spillover of diseases are increasing with modern trends in globalization, growing population pressures, climate change, economic development, mass urbanization and 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. It is meant to improve indicator- and event-based surveillance, which is the cornerstone of the early warning function of the IDSR. Animal and human health workers as well as other relevant partners should be engaged at various levels, as information sources for IDSR, to further facilitate information sharing and joint rapid response activities. The One Health approach offers a comprehensive framework for IHR (2005) implementation and helps to address PHEIC of all sources. The key principles of the One Health approach include prevention and control of emerging infectious diseases (reference to IHR 2005 and the World Organization for Animal Health (OIE) international standards), and support for national public health services, building on existing structures.

The One Health approach principle 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.

A.6 IDSR and Disaster Risk Management (DRM)

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

Disaster risk management is defined as the systematic process of using administrative and organizational directives, operational skills and capacities to implement strategies, policies and improved coping capacities, thereby lessening the adverse impact of hazards and possibility of disaster. In disaster risk management, a hazard analysis is conducted, followed by an assessment of the level of vulnerability and available coping capacity. The ultimate objective of DRM is to lower risk by reducing vulnerability or improving the capacity to mitigate the impact of a hazard.

IDSR is an important tool in the DRM, as it provides early warning information, which is crucial for risk assessment and ultimately, risk reduction. IDSR assists in identification of hazards, assessment, risk communication and monitoring of disaster risks, thereby enhancing the early warning component.

A.7 Implementation cross-border activities in the context of IDSR

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 the spread

of these diseases. The free movement of people and goods across the region's borders provides opportunities for cross-border spread of diseases. In addition, at urban centers 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 countries in the region would coordinate and synchronize interventions, in an effort to control the spread of communicable diseases. Developing a cross-border framework will therefore provide an opportunity for counties to initiate and boost priority cross-border activities for disease control, including, but not limited to, disease surveillance, epidemic preparedness and outbreak control, as well as building core capacities to ensure compliance with IHR (2005).

There currently exists a cross border mechanism for East Africa Partner State and bilateral collaboration agreements with neighboring non-East Africa Community Countries.

When outbreaks are detected through the IDSR system, the neighboring cross-border areas and Sub Counties should be notified, using the IDSR reporting tools. If they are reporting a similar outbreak, coordinate response efforts with the IDSR response structures as described in **Sections 4, 5 and 6** of the third edition IDSR Technical Guidelines.

To ensure cross-border (country-Country, Sub County-Sub County) coordination and collaboration on surveillance issues and provide notification of any outbreaks in the neighboring sub county. International or cross border notification should also be given if needed, every time a notifiable disease is detected.

The Counties should organize and conduct simulation exercises with cross-border Sub County teams. Organize regular cross-border meetings, with support from the administrators and stakeholders.

A.8 Electronic IDSR as a platform for enhancing real time Surveillance

Electronic IDSR (e-IDSR) is the application of electronic tools to the principles of IDSR, to facilitate real time reporting, monitoring, prediction, mitigation, detection, prevention, reporting and response. It is based on:

- Standardized 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 timely information, counties should aim to have electronic tools to facilitate timely data transmission and response to public health threats. Counties should adapt use of eIDSR to:

a) Fulfil the WHO regional committee recommendations on use of information technology, which is core to the achievement of IHR (2005) requirements by countries;
b) Assist in standardization of data collection;
c) Actualize timeliness and completeness of reports
d) assist in early detection, investigation, and response to outbreak or public health events;

e) reduce manual data entry, as it is prone to errors;
f) ensure systematic information sharing across levels and sectors;
g) enable better data transmission and management including data storage and easy access;
h) enhance virtual, near real-time disease monitoring capability;
i) improve data quality;
j) Reduce system costs and easily generate automated alerts.

Section 9 describes in detail the key guiding principles for establishing eIDSR.

A.9 Described surveillance functions in these guidelines

These guidelines assume that all levels of the health system are involved in conducting surveillance activities for detecting and responding to priority diseases, conditions and events. These activities include the following core functions:

Step 1: Identify and record cases, conditions and events

Standard case definition is used for health service delivery points (human, animal and environment); simplified case definition is used at the community level to identify priority diseases, conditions, and alerts that may signal emerging public health events. Additionally, case identification can 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 must be recorded in a recognized register.

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

If this is an epidemic-prone disease, a potential PHEIC or a disease targeted for elimination or eradication, respond immediately by investigating the case or event, collecting the necessary diagnostic samples, and submitting a detailed report. For events to be notified under IHR to WHO, the national focal point is required to use the decision instrument (Annex 2 of IHR) to identify any potential PHEIC.

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

Surveillance data should be compiled, cleaned, tabulated and analyzed for trends, compared with data from previous periods, alongside thresholds and interpreted for use in public health actions.

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

Case/outbreak confirmation involves the epidemiological investigation of suspected cases and capacity of the laboratory to make confirmation. Take action to ensure that the case and contacts, and the outbreak or event is investigated, and laboratory confirmed. The capacity for case confirmation is enhanced through improved referral systems, networking and partnerships. Gather evidence about what may have caused the outbreak or event, by including non-human (animals - domestic and wildlife), and environmental sources of information, and using this to select appropriate control and prevention strategies. Social, gender and behavioral factors should also be collected and used to produce locally appropriate responses and risk communication.

Step 5: Prepare

Preparedness refers to the ability of institutions to professionally anticipate an imminent event of public health importance and put in place response mechanisms and resources for effective response in the event that the anticipated event/s occurs. Preparedness makes a major difference in efficient and effective response reducing fatalities and morbidity.

Preparedness calls for capacity building through strengthening human resources, stockpiling and preparation of response plans ahead of time. Mobilizing resources and identifying competent teams and surge staff for appropriate response.

Use historical data from human health and other relevant sectors such as meteorological, animal and environment to assess vulnerabilities and risks to the population. The risk analysis can also be conducted through prediction models.

Step 6: Respond

When an event occurs or condition is detected, investigation should take place to determine the cause of the event, magnitude and identify vulnerable population and population at-risk. Identify gaps, coordinate response mechanisms, and mobilize resources and personnel to implement the appropriate public health response. The results of the investigation should guide the response.

Depending on the scale and magnitude of the event, EOC can be activated to provide a coordination platform for all public health events of public importance.

At the subnational level, County EOCs should be activated for response. A spokesperson should be identified, and a risk communication plan and coordination platform set up for all relevant communication to stakeholders. Engagement with community, political religious leaders and opinion leaders to ensure adequate community involvement for successful responses.

Step 7: Risk communication

Risk communication is the real-time exchange of information, advice and opinions between experts, community leaders, or officials and population at-risk. Surveillance and response both rely on efficient and effective communication. Mitigation, Prevention and control efforts rely on effective risk communication. Resources mobilization for response is dependent on timely and appropriate use of channels and media of communication. The message Content, type of media, channels of communication as well as the language are all dependent on the target audience.

Reduction of morbidity and mortalities are dependent on effective risk communication.

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

Monitoring is the continuous tracking activities planned and the progress against set targets. Whereas Evaluation is the systemic assessment of the design, implementation and end results as measured against the primary objectives and benefits thereof to the population targeted. Supervision refers to routine inspection of the activities and processes against known and set standards of operation.

The three aspects of management are very important in surveillance by monitoring surveillance activities, supervising the implementation and evaluating the overall outcome to measure effectiveness and the efficiency in responding to events of public health importance.

Supervision provides feedback to reinforce health workers' efforts to participate in the surveillance system.

Take action to correct problems and make improvements. Different evaluation procedures such as After-Action Review, Joint External Evaluation, simulation exercises, and operational review may be used. Community representatives, the private sector and NGOs should be included during monitoring and evaluation activities.

A.10 Different levels where surveillance activities are performed

The surveillance levels comprise of the following:

a) Community Level

Represented by basic community-level services such as trained birth attendants, community health volunteer or similar care providers, village or community leaders (religious, traditional or political) or school teachers, other health extension workers, locally identified community-based surveillance volunteers, veterinarians, chemical sellers and traditional health practitioners. The community health volunteer is the focal point for community surveillance reporting to the Community Health Assistant (CHA) or the link health facility in charge. The community surveillance uses the lay case definition as well as signals as defined under event-based surveillance.

b) Health Facility Level

Health facility surveillance is undertaken at all service delivery points (public, private, NGOs or faith-based organizations) with outpatient and/or inpatient facilities defined as a health facility. The health facilities are classified by level of service provided from tier 1 to tier 6. At health facilities, standard case definitions are used for detecting suspected cases and reported accordingly either immediately, weekly or monthly as defined by the reporting guidelines

c) Sub-County and County Level

The intermediate administrative unit generally serves a population of 100 000 to 300 000. At this level, data reported from all health facilities within the sub-county or county are aggregated, tabulated and analyzed to provide an overview of incidents and trends of event/ diseases occurring at under that level overtime.

d) National Level

This is the central level where policies are developed, coordination and national mentorship is undertaken. Data generated from all facilities and all surveillance levels are aggregated, tabulated and analyzed to give a national overview of trends and occurring events across the country.

At the national level, surveillance indicators are defined, monitored and corrective measures initiated. Sample collection, packaging and transportation to the appropriate laboratories is undertaken.

The national administrative level has the overall responsibility for all surveillance and response activities. It facilitates resource mobilization, undertakes capacity building, develops and enforces of policies and monitors guidelines implementation.

The National level is responsible for reporting to WHO in compliance with the revised IHR 2005.

A.11 How to strengthen Surveillance and Response

WHO recommends continuous monitoring and evaluation of the surveillance system at all levels. Counties should use a matrix of IDSR functions and description of roles in the surveillance system. The matrix should describe a complete system in which all activities are in place.

Based on the routine monitoring, any diversion from the expectation is identified and addressed. The IDSR TG provides timelines for selected activities and thresholds for diseases and events with corresponding corrective measures.

Note: WHO-AFRO has a generic protocol for assessment of surveillance and Response activities. (Protocol for the Assessment of National Communicable Disease Surveillance and Response Systems WHO/CDS/CSR/ISR/2001.2).

Practical uses of the IDSR matrix include:

- Ensuring that all necessary functions have been identified and planned for
- Establishing basis for assigning functions to appropriate levels
- Organizing activities and training for human resource development
- Managing, monitoring and evaluating programs
- Strengthening Sub County laboratories capacity and their role in surveillance activities.
- Planning for resources (human, material/supplies and financial).
- The functions of detection, reporting, analysis, investigation, response, risk communication, monitoring, evaluation, and providing feedback are interdependent and should always be linked.

The IDSR matrix in Annex A, defines the surveillance functions and how they are achieved at each level of the health system including the role of WHO in relation to IDSR core functions.

A.11.1 Efforts by WHO in the Africa Region to strengthen IDSR

WHO-AFRO provides technical support for implementation of surveillance and response at every level of the health system that is not limited to including:

- The development of comprehensive technical guidelines for each level.
- A protocol for adapting the guidelines to every level within each country.

- Training of human resources involved in surveillance and response system.
- Advocacy for resources and resource mobilization.
- Regional coordination, monitoring and provision of technical support to countries.

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.

The following is a list of intended users of the IDSR TG:

- Surveillance coordinators at all levels
- IHR national focal points
- Health authority at points of entry
- Hospital managers, clinicians
- Laboratory personnel and managers
- Veterinary officers
- Public health officers
- Health management teams
- Nurses
- Pharmacists
- Paramedics
- Community leaders, ward leaders etc.
- Other public health experts and practitioners in specialized institutions
- Health training institutions
- Partners, stakeholders and Ministries, Departments and Agencies (MDAs)

A.12 IDSR Priority diseases, conditions and events

The priority diseases and conditions are classified into the following categories:

a) Epidemic prone diseases
b) Diseases targeted for eradication or elimination
c) Diseases, events or conditions of public health importance
d) Diseases that require reporting under IHR 2005

Table 1: *Priority diseases, conditions, and events for surveillance under IDSR 2021*

Epidemic-prone diseases, conditions or events which require immediate reporting	**Diseases targeted for eradication or elimination**	**Other major diseases, events or conditions of public health importance**
Acute haemorhagic fever syndrome* Anthrax Bacterial Meningitis Chikungunya Cholera Dengue fever Dysentery (Shigella) Malaria Plague SARIs** SARS Typhoid fever Yellow fever Measles NNT Dracunculiasis Maternal death Zika virus **Also:** A cluster of deaths in the community.	Dracunculiasis (Guinea Worm Disease) Leprosy Rabies Lymphatic filariasis Malaria Measles Neonatal tetanus Poliomyelitis*** Onchocerciasis Trachoma Human African Trypanosomiasis *** Disease specified by IHR (2005) for immediate notification	Acute jaundice Adverse events following immunization (AEFI) Diabetes mellitus (new cases) Diarrhea with dehydration in children of less than 5 years of age Epilepsy HIV/AIDS (new cases) Hypertension (new cases) Injuries (road traffic accidents) Extreme Malnutrition in children under 5 years of age Maternal deaths Non-neonatal tetanus Perinatal deaths Severe pneumonia in children of less than 5 years of age STIs Schistosomiasis Soil transmitted helminths Trypanosomiasis Tuberculosis (new cases) MDR/XDR Tuberculosis
	Diseases or events of international concern	

A cluster of unwell people or animals with similar symptoms	Human influenza due to a new subtype*** SARS*** Smallpox*** Zika virus disease
*Ebola, Marburg, Rift Valley, Lassa, Crimean Congo, West Nile Fever	Yellow fever Any public health event of international or national concern (infectious, zoonotic, food borne, chemical, radio nuclear, or due to unknown condition.
**National programmes may wish to add Influenza-like illnesses to their priority disease list	*** Disease specified by IHR (2005) for immediate notification

A.13 Organization of the IDSR guideline

The sections in the guidelines are organized into 11 sections as below:

Introduction Section

Section 1: Identify and record diseases conditions and events

Section 2: Report priority diseases, conditions and events

Section 3: Analyze 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 other public health events

Section 7: Risk communication

Section 8: Monitor, evaluate, supervise and provide feedback to improve surveillance and response

Section 9: Electronic Integrated Disease Surveillance and Response

Section 10: Tailoring IDSR to emergency or fragile health system contexts

Section 11: Disease specific guidelines

Note:

Each section is relevant for all levels of the health system and provides a perspective on how each level of health care can carry out each function to attain the required level of surveillance and response. Furthermore, a section on Electronic Integrated Disease Surveillance and Response has been included to summarize and guide on the establishment of eIDSR system. Each section has annexes, which reference key functions highlighted in details in the guidelines.

Annexes for the Introduction Section

Annex A IDSR matrix: Core functions and activities by health system levels

Annex B Tool for assessment of surveillance and response at the Sub County level

Annex C IHR 2005 Decision Instrument

Annex D Potential public health emergencies of international concern that require reporting to WHO under the International Health Regulations (2005)

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

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

Annex G Roles and Responsibilities of various actors in IDSR.

Annex H Guide for establishing surveillance and response systems at PoE

Annex A: IDSR Matrix Core Functions and Activities by Health System Levels

IDSR Matrix: Core functions and activities by health system level								
Health System Levels	**Identify**	**Report**	**Analyze and interpret**	**Investigate and confirm**	**Prepare**	**Respond**	**Communicate risk**	**Monitor, Evaluate, Supervise and provide feedback**
Community	Use alert triggers to identify priority diseases, events, conditions or other hazards in the community. Support community in case finding and promote use of alert triggers	Report essential information on alert triggers to health facility (HF) and appropriate authorities	Involve local leaders in observing, describing, and interpreting disease patterns, events, and trends in community. Map community catchment area.	Support investigationactivities. Follow up on rumors or unusual events reported by community leaders or members. Act as liaisons for feedback to community on follow upactions	Participate in identifying public health risks Participate in training on identifying potential diseases, conditions events, and simulation exercises	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 Participate in social research and conduct community health education for behavioral and	Identify opinion leaders and influencers in the community to ensure ownership of communication process Build relationship with nearby health facility for communication and coordination Incorporate cross- sectoral communication with animal and environmental sectorsto establish a One-Health approach at the community level.	Give feedback to community members about reported cases, events, and prevention activities Verify if public health interventions took place as planned Participate in after- action reviews

						communication change		

Health Care Facilities	Use standard case definitions to detect, laboratory confirm and record priority diseases or conditions Collect, and package specimens for laboratory confirmation. Verify alerts from community Ensure appropriate storage of surveillancematerials	Report case-based information for priority diseases Report weekly summary data tonext 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 actionthreshold Occurs in locationswhere it was previously absent Presents unusual trends or patterns	Take part in investigation of reported outbreaks Collect, package, store and transport specimens for laboratory confirmation during investigation	Participate in sub-county task force Participate in response training and simulation exercises Monitor and maintain emergency response supplies	Participate in the response activities including case management and contact tracing according to standardguidelines Take relevant additional controlmeasures Participate as part ofrapid 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 contactwith community Conduct regular meetings with VHTs about surveillance and response activities integrated with other health programs	Assess community participation Conduct a self- assessment on the surveillance and response activities Monitor and evaluate prevention activities and modify them as needed Provide weekly summary data at community level meetings Provide feedback on outcome of investigations to VHTs

Sub-county	Support Health Facilities to verify signals from community Collect surveillance data from health facilities and the community and review the quality Ensure reliablesupply of data collection and reporting tools are available at health facilities Ensure healthfacilities havematerials for	national level	Aggregate data fromhealth facilities Use and refine denominators for rates Analyze data by time,place and person Assist health facilities to update graphs, tables, and charts to describe reported diseases, conditions and events weekly Integrate epidemiological and laboratory data for betteranalysis	Arrange and lead investigation of verifiedcases or outbreaks Maintain an updated linelist of suspected cases Assist health facilities in safe collection, packaging, storage and transport of laboratory specimens for confirmatory testing Receive laboratory results from the national reference laboratories and give to health facilities Report finding of initial investigation to nationallevel	Establish and ensure functionality of the DTF Participate in risk mapping and community assessment Organize, establish andensure functionality of sub-county rapid response teams Participate in and support response training of health workers and VHTs	Together with the national level selectand implement appropriate public health response Plan timely community information and education activities Document response activities In case of outbreakssend daily sub-county Sitreps	Establish risk communication systems and structures Ensure engagement ofrisk communication partners and stakeholders Develop an up-to-daterisk communication plan and test during an actual emergency or simulation exercise Develop and build on relevant sub-county stakeholder and organizational networks to improve information flow	Conduct regular supervisory visits ofhealth facilities Provide feedback to the health facilities and community on surveillance activitiesand priority events Provide regular and periodic feedback to health facilities and communities on routine control and prevention activities and outbreaks Monitor and evaluate program timeliness and completeness of reporting from health facilities to the sub-county

	laboratory sample collection and transportation		Compare data and make conclusions about trends and thresholds				Ensure risk communication is partof the emergency response systems Alert and inform communities about outbreaks or events	Monitor and evaluate timeliness of response to outbreaks Gather information from affected communities on needs and impact of response Conduct sub-county level surveillance review meetings to include key stakeholders Conduct operational research to improve system performance
County	Ensure reliable supply of case definition posters, data collection and reporting tools are available at health facilities Ensure laboratory specimen collection and transport material is available	Ensure that Sub-counties know and use standard case definitions for reporting and verifying priority diseases conditions and events Provide instructions and supervision for surveillance and reporting priority diseases conditions and events for healthcare facilities and communities.	Ensure accuracy of denominators for thecounty Aggregate data from DSFP reports Analyze data by time, placeand 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 Compile Sub- County level line lists of suspected cases Report the confirmed outbreak to National level Ensure specimen collection kits for investigation activitiesare available	Conduct training and simulation exercises forstaff Periodically conduct risk assessment for risk factorsand potential diseases, conditions and events Ensure functionality of county public health emergency operations Centre (County EOC) Organize and support	Select and implement appropriate public health response Conduct training for emergency activities Plan timely community information and education activities Disseminate health education and behavior change messages	Establish risk communication systems and structure Ensure accessible and relevant information, education and communication materials tailored to the needs of the population Ensure the use of evaluation to inform risk communication	Monitor and evaluate program targets and indicators for measuring quality of the surveillance system for Sub-counties and health carefacilities Give feedback to sub-counties on surveillance and data quality findings Give regular, periodic feedback about routine control and prevention activities and outbreaks

		Receive regular surveillance data from the DSFP and review the quality Report data on time to the MoH			Rapid Response Team		planning Alert nearby areas and counties and sub-counties about the outbreak including cross border areas	to sub-counties Provide regular assessment of staffing needs for IDSR implementation and inform the next level Conduct regular supervisory visits.

								Monitor and evaluate timeliness of response to outbreaks and events
National	Define and update national policy and guidelines and ensure compliance Set policies and procedures for the reference laboratory networks including quality assurance systems Use reference laboratories for confirming and specialized testing if necessary Collect and transport specimens for additional analysis to external reference laboratories as necessary	Train, inform and support lower levels on surveillance and response Aggregate sub-county reports of immediately reportable diseases and events Report other priority diseases, conditions and events on time to relevant programs andstakeholders Include all relevant laboratories in the reporting network Use IHR Decision Instrument (**Annex 2**A) to determine risksfor priority diseases, conditions and events Inform WHO in linewith IHR (2005)	Set policies and procedures for analyzingand interpreting data Define denominators and ensure accuracy Analyze 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 surveillance pillar that feeds into the NTF and relevant TWGs at the MINISTRY OF HEALTH to review the Analyze d and interpreteddata before wider dissemination Carry out special Analyze sto forecast magnitude andtrends of priority events	Ensure guidelines and standard operating procedures for outbreak investigations are available at all levels Deploy National Rapid Response team for outbreak investigation and response Coordinate and collaborate with international authorities as needed during investigations Coordinate with sub-county health teams as needed during outbreak investigation and response. Alert and support laboratory participation Provide logistic support for the field investigations Share information with country and international networks about confirmed outbreak	Set policies, procedures, and training for each level Undertake risk mapping Prepare and distribute emergency preparedness and response plans Develop National risk communication plan including messages for community education Organize and support National Public Health Emergency Rapid Response Teams (RRTs) Develop and organize simulation exercises (including cross border) Develop and manage contingency plans Establish and ensure functionality of national public health emergency operations center (PHEOC)	Set policies and procedures for responding to outbreaks of priority diseases, conditions and events Develop and support response activities that promote the psychological wellbeing of patients, HCWs, affected families and communities Coordinate response with sub-county health teams Support epidemic response and preparedness activities including deployment of RRTs Adapt and follow guidelines for all response pillars	Establish risk communication systems and structure Ensure engagement of risk communication partners and stakeholders Develop an up-to-date risk communication plan and test during an actual emergency or simulation exercise Develop policies, SOPs and guidelines covering clearance and release of information during a public health emergency Regularly update information sources accessible to the mediaand the public for information dissemination Ensure accessible and relevant information, education and communication materials tailored to the needs of the population	Monitor IDSR and laboratory core indicators regularly Give sub-counties regular feedback about routine and prevention controlactivities Share epidemiological data and reports including outbreak response information with neighboring 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 surveillanceand response activities, After

				Process specimens from investigationand send timely results	Monitor operational readiness using readiness checklists as reference tools		Release information in a transparent and timely manner	Action reviews (AAR) including lessons learned from outbreak investigation and response

							Ensure the use of evaluation to inform risk communicationplanning Ensure trained personnel for risk communication are available across all levels	Support annual monitoring of IHRcore capacities Update and revise work plan and budget line for implementation of IDSR activities Document and provide timely feedback

WHO AFRO Country Office	Develop and disseminate generic guidelines for surveillance Encourage documentation & sharing of IDSR best practices Provide technical support to national level fordetection and confirmation of priority diseases, conditions and events Coordinate international reference laboratory network support including centers of excellence	Collect and compile reports of outbreaks and international notifiable diseases and events Produce annual country profiles orsituation reports by priority diseases, conditions and events	Provide guidance for better data analysis anddevelopment of bulletins/information products Develop and disseminatebest 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 Incident Management Systems(IMS).	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 county levels Post on the WHO website and disseminate relevant links to all individuals and partners Use reports from Counties toassess IDSR systems and advocate for improvements Develop, update or revise guidelines and tools for IDSR/IHR monitoring and evaluation Develop and disseminate countysurveillance bulletin Promote, guide andsupport operationalresearch Ensure functionality of the IDSR Task Force

								Regularly monitor the key performance indicators for IDSR and IHR and performance standard according to revised ERF
Point of Entry	Use case definitions or alert triggers to identify suspected passengers or events related to travel and transport Support community in case finding	Report immediately to the IHR National Focal Point and at the same time sub-county/national level Report monthly summaries to the National Surveillance department/unit and at the same time share with the respective sub-county and county	Prepare and periodically update database of cases/events detected	Participate in assessing potentially exposed/infected travelers in a holding center Support investigation of suspected passengers and contacts. Follow up on rumors or unusual events reported by community leaders or members.	Participate in emergency preparedness and response committeeswithin PoE Participate in preparation of PoEcontingency plan Participate in training and simulation exercises Participate in cross border meeting	Assist in referring the ill passenger to the appropriate medical facility Liaise with the emergency and preparedness committee in response activities Assist in case and contact finding Follow and model best practices in basic infection prevention and control (IPC) measures	Build relationships, communicate and coordinate for information sharing with various stakeholders (IHR FP,Civil aviation/port authorities, ICAO, Build communication with ship and ship industry operators, regarding authorization and the Maritime Health Declaration, Build relationship with Surveillanceofficers across alllevels and the IHRNFP	Monitor and evaluate prevention activities and modify them as needed Conduct periodic simulation exercises

Annex B: Tool for assessment of surveillance and response at the Sub-County level

Kenya has used the Joint External Evaluation (JEE) assessment tool to assess the national surveillance, epidemic preparedness and response systems and to identify where improvements are needed. The national strategic plan has also been used as reference point. The National Action Plan for Health Security has also been used.

The Integrated Disease Surveillance and Response is not proposing the establishment of a new system, but rather providing guidance on how to prepare to conduct surveillance and response activities. However, if the Sub County has the resources and skills to conduct an assessment to document the situation of surveillance and response activities within the sub-county, or wishes to update the sub-county profile, then they may use the checklist below after adapting it to the local context. This tool could guide sub counties in identifying activities to improve their performance and capacity for disease surveillance and response.

Case and event identification

Determine availability and knowledge of standard case definitions for reporting suspected priority diseases and conditions, including events of public health concern.

Define the sources of information about health events in the sub-county, including points of contact the community has with health services. For example, the following is a list of sources of surveillance data at sub-county reporting sites:

- Health facilities and hospitals
- Laboratories (including non-public ones: private for profit, military, NGOs, faith-based)
- Point of entry
- Community health workers (including community animal health workers)
- Community volunteers or focal points (shopkeepers, market women, barbers, farmers, etc.)
- Birth attendants
- Traditional healers
- Rural community leaders who have knowledge of health events in the community (for example, the village elders, traditional healers, school teachers and leaders of faith-based communities)
- Public health officers
- Private sector practitioners
- Public safety officers from the fire, rescue or police departments
- Animal health and veterinary structures and services
- Industry, food safety and environmental health laboratories
- Mass media, web sites and health news search applications (o)
- Others, including NGOs.

It is important to have and maintain a rumors logbook for rumors of events reported and feedback loop to confirm or dispel them.

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

Reporting

Specify the priority events, diseases and conditions for surveillance within the Sub County and those directed by national policy. List diseases that are:

a) epidemic prone or events, such as unexplained cluster of illness or deaths, which require immediate reporting;
b) targeted for eradication and elimination;
c) of public health importance, including non-communicable diseases.

For each priority event, disease or condition, review the minimum data elements that health facilities and other sources should report. State when they should be reported, to whom and how. State the information that should be reported from inpatient and outpatient sources. For example, a minimum requirement would be to report all cases and deaths for the selected diseases and conditions.

State the diseases or conditions that require immediate reporting and communicate the list to health facilities in the sub-county.

Define the means for reporting data to the Sub County (by phone, form or voice). If there is electronic reporting, do all facilities have access to computers and modems? Specify how electronic reporting should be done and if paper forms will be used to collect data, how transcription will occur from paper to electronic form.

Define how often the required data should be reported.

Define a feedback mechanism from Sub County to higher levels (region and Sub County levels).

Define the data management tools available in the Sub County and how they should be used in an integrated system.

Define how frequently the tools should be used for reporting diseases, conditions or events. The tools may include:

- Case-based surveillance reporting forms;
- Diagnostic (if point of care is used) and lab-specimen-based surveillance reporting forms;
- Specimen tracking forms/logbooks (within the laboratory) and also forms/logbook for referral of specimens;
- Line lists for use in outbreaks while also ensuring comprehensive capture of variable from other non-human sectors;
- Contact tracing forms;
- Tables for summarizing and submitting IDSR data sets:
- Routine weekly reporting forms
- Routine monthly reporting forms

- Routine quarterly reporting forms

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 sub-county, regional and national levels. In Kenya the Kenya Health Information System (KHIS) has been deployed to the subcounty and health facilities from level 4. If electronic reporting is not available, ensure that the focal points responsible for managing data have a reliable supply of data collection forms, paper, colored pencils, graph paper, and log books.

Define mechanism to ensure that data is collected as per given timelines and introduce mechanism for accountability if reports are not submitted on time.

Data Analysis

a) Define the data management requirement for each reporting site. For example, develop and disseminate the procedures, including deadlines, so that reporting sites know that they must report each reporting period (for example, monthly).
b) Tally, compile and report summary totals
c) Periodically check data quality and eventually clean them
d) Analyze data: produce weekly/monthly/quarterly/annual summaries in tables, graphs or maps
e) Provide some interpretation to the next higher level
f) Submit data to the next level (SMS, e-mail, fax/case-based forms, and line list)
g) File and secure back-up copies of the data
h) Provide feedback and recommendations to the community focal points, all relevant reporting sites and community leaders, and track implementation of recommendations.
i) Decide if current forms address the priorities of integrated disease surveillance and response. For example, do current forms provide the information necessary for detecting problems and signaling a response to priority diseases targeted for surveillance?
j) Gather and present relevant data about your Sub County that can be used to advocate for additional resources for improving surveillance and response activities. (Example: Health workers are able to document an increase in malaria cases; they know that an effective response is available with insecticide-treated bed nets. The Sub County surveillance officer used data to show the expected reduction in malaria cases if some of the community's bed net cost could be supported by local businesses).

Investigation and confirmation of suspected cases, outbreaks or events:

Describe the laboratory and diagnostic referral network for confirming priority diseases and conditions in the sub-county. For example, list the following:

- Public, private or NGO Sub County facilities which have point-of-care diagnostics or use Rapid Diagnostic Tests laboratory services.

- Public, private or NGO Sub County facilities with reliable laboratory services for confirming priority diseases.
- Prevention, control or special surveillance activities in the Sub laboratory access (for example, any HIV sentinel surveillance sites in the sub-county).

Describe the methods or mechanism for active case search, and where appropriate, the procedures for searching for contacts.

Preparation for response to outbreaks and other public health events

Update the policies of the Sub County rapid response team so that assessing preparedness becomes a routine agenda item for the team. Refer to Section 4 for composition of the public health emergency RRT.

Identify a coordination mechanism which will oversee the meetings for preparedness and response. Refer to Section 5 on how to formulate a coordination mechanism and the composition of the team, which will lead the response and planning process for meetings. Specify and disseminate schedules for:

Meetings to routinely assess preparedness for public response and discuss current problems or activities. Put mechanisms such as reminders in place to ensure that meetings take place as planned;

Meetings to discuss outbreak response, including reviewing key recommendations and actions, and status of implementation.

For each priority event, disease or condition selected, state the available public response activity and develop a contingency plan for the particular priority event, disease or condition. Identify possible activities and interventions for which the Sub County would require help from outside. Refer to **Sections 4, 5, 6 and 9** for key standard elements needed in the preparedness and response activities.

For each disease or condition that the sub-county can respond to, specify the target and alert threshold, or analyze results that would trigger an action.

Communication and feedback

Define methods for informing and supporting health workers in the implementation of integrated disease surveillance by:

- Listing the current opportunities for training health workers in surveillance, response or data management in the sub-county.
- Coordinating training opportunities between disease programs that take advantage of overlapping skills such as supervision, report writing, budgeting, data analysis, and using data to set priorities.
- defining the training needs for each category of health workers, based on supervision, or during response to a particular event. Decide whether this will be an initial training in

surveillance and response skills or a refresher training on how to integrate surveillance activities.

- Establishing indicators of quality (management) performance of health workers and regularly assess the performance of health workers.

Describe how communication about surveillance and response takes place between the Sub County and the surveillance focal points and other focal points from animal and other key relevant sectors. Clarify who is responsible for periodic reporting at each level. Include methods such as monthly meetings, newsletters and telephone calls.

Review and update feedback procedures and methods between the sub-county, health facilities and community, as well as between the Sub County and higher levels. Specify the feedback methods and update as necessary:

- Bulletins summarizing data reported by health facilities to the sub-county.
- Periodic meetings to discuss public health problems and recent activities.
- Supervisory visits.

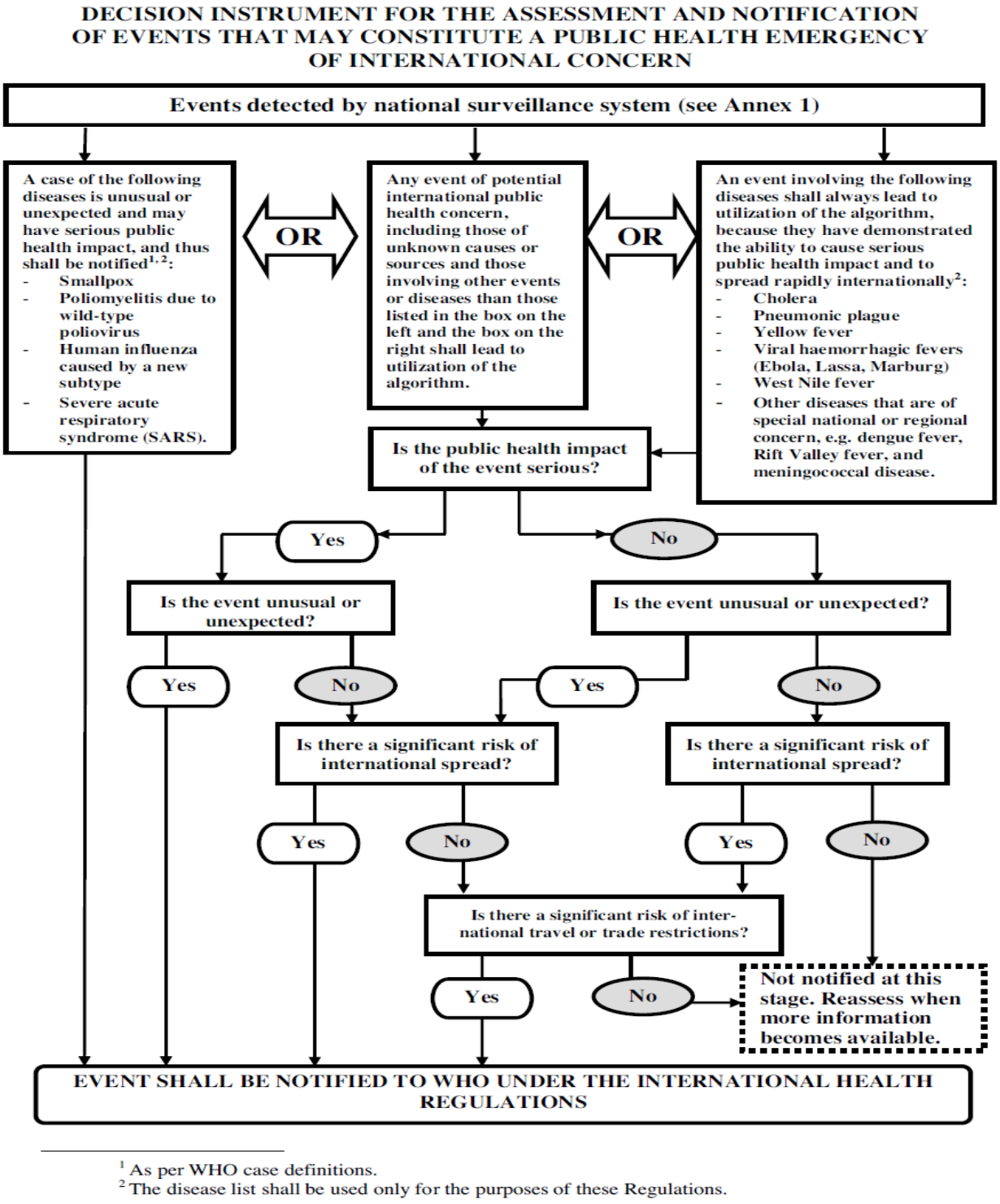
Outline the communication mechanism available, including protocols and guidelines for risk communication. Identify a spokesperson and ensure training has been done on required protocols. Develop a mechanism of linkage between the community and health facilities with the epidemic preparedness and response committee that can be activated during an outbreak and for routine activities. Refer to Sections 6 and 7 of the guidelines, on the key elements for risk communication before, during and after the outbreak.

Evaluation and improvement of the surveillance system

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

State three or more objectives you would like to achieve for improving surveillance in your Sub County over the next year, based on evidence.

Annex C: IHR Decision Making Instrument



[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

Figure 6: *IHR Decision Making Instrument*

Annex D: Event of potential international health concern requiring reporting to WHO under 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 International Health Regulations (2005). There are control programs, which address infectious diseases and food and environmental safety and contribute significantly to the WHO global alert and response system.

Environmental hazards include, but are not limited to:

- Chemicals
- Food
- Ionizing radiation
- Non-ionizing radiation

Technical information on these risks can be obtained from various sources (**See the references at the end of this document**). Areas of interest for e purpose of capacity building of integrated surveillance should include partnerships to address the following:

Environmental health emergencies such as:

- Natural events
- Technological incidents
- Complex emergencies
- Deliberate events
- Chemical risks in food:
- Acute and chronic dietary exposure (environmental or intentional pollution).

Zoonosis:

- Emerging zoonosis
- Neglected zoonosis

TOPICS FOR SURVEILLANCE ON SPECIFIC RISKS

Infectious disease hazards

Known, new and unknown infectious disease threats

Zoonotic disease events

Using a One Health approach is critical to linking 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 could save lives.

Food safety events

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

Chemical events

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

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, even if the source of exposure has not been confirmed.

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

Annex 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. They are also to ensure 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:

Community event-based surveillance (CEBS) relies on reporting of unusual events and is designed to rapidly identify problems in the community. Information may be incomplete, unconfirmed or even a rumor. The definition of an 'unusual event' changes 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".

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 may come from people, including CBS volunteers, who have already received guidance on the indicators.

CIBS relies on reporting a suspected case or the trend of specific diseases, using a lay case definition. A lay case definition is composed of two or three easily identified signs or symptoms associated with a specific disease. It is a more basic form of syndromic (symptom) reporting that is used by health professionals in national/IDSR and other disease surveillance systems. Examples include influenza, whose community case definition is "sudden illness, fever, cough and difficulty in breathing, and acute flaccid paralysis (AFP), defined as sudden onset of paralysis/weakness in any part of the body of a child less than 15 years of age.

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

Steps for establishing Community Indicator-Based Surveillance (CIBS)

A crucial step in establishing the community-based surveillance is to ensure buy-in of both national and subnational level authorities. This will enable the CBS system to be recognized formally as part of the National Surveillance System and people will then be designated. A designated health facility manager or surveillance officer responsible for coordinating CBS activities should therefore:

- Determine within the facility, the availability and knowledge of standard community case definitions for reporting suspected priority diseases and conditions and events of public health concern;
- Sensitize community leaders, elders and other influencers about the need for CBS, what information is needed, how the information will be used, the process being proposed, the characteristics of successful CBS focal persons, the financial or human resource support being offered by the sub-county, and what the community gains by participating;
- 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 early detection of alerts (for example, sensitizing the women and men that often visit the grain milling or tea drinking places).

The sources of information include:

Home visits - where CBS focal persons are expected to visit all homes in their catchment area regularly to inquire about the priority diseases, any deaths that might have occurred since their last visit.

Gathering places - Another way to pick up information on priority events will be for CBS to frequently go to village gathering/meeting places. This will not serve as a substitute to the home visits, but rather, another approach to ensuring that all priority events are identified in good time. Gathering or meeting places in the community are where people gather to talk and share news by word of mouth. Examples include community wells, pumps or rivers, where women gather every to collect drinking water or wash clothes. While they work, women exchange news about their families and neighborhood.

Grain milling or grain pounding places - In some communities, women gather every day at the same place to mill, grind or pound grain into flour. They often exchange news about their families and the neighborhood as they work.

Beer, palm wine or tea drinking places - In some communities, men gather every day at bottle shops, other drinking places, in a home or shop, or in the shade under a special tree, to drink and socialize. As they drink, they sometimes tell each other the news about their families, friends and neighbors.

At the market - A good deal of information and news is exchanged at the market. People who go there spend some of their time buying or selling things and the rest of their time talking to friends and neighbors.

At churches, mosques or temples - Sometimes religious leaders make announcements before or after the service to let people know about things happening in the neighborhood. Also, people who attend church or go to the mosque often talk together before or after the service to exchange news about their families, friends and neighbors.

At the home of the village chief or the place where the 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.

At schools and in schoolyards - Teachers and pupils often share information and news about their families and friends when they see each other at school or when they play in the schoolyard.

- 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 persons(s). Focal persons should be people trusted by the community and committed to 'zero-case' reporting. They should be reassured that reporting bad news won't get them into trouble, hence they do not need to falsify data;
- specify the alerts, events, diseases and conditions for surveillance within the catchment area and those directed by national policy; also specify the trigger mechanisms;
- compile a list of epidemic-prone diseases, those targeted for eradication and elimination, and other diseases of public health importance including non-communicable ones;
- Define methods for informing and supporting focal points in the implementation of CBS. These may be through monthly meetings, or telephone calls. List the current opportunities for training focal persons in surveillance and response;
- Define training needs. Develop and pre-test picture-based/simplified training material development for non-literate/semi-literate populations for surveillance and reporting; develop picture and game-based job aids and illustrative daily/weekly schedules;
- Train CBS focal persons in surveillance and response skills as well as improved interpersonal skills, using interactive training, adult learning techniques and role-playing. Use of cell phone-based opportunities to show MP3s or other video clips can be helpful during training and in the community;
- Describe how communication about surveillance and response takes place and will be tracked between the health facility/surveillance officer and the CBS focal persons. For literate CBS focal persons, design simple alert forms (See Annex 2B) and show them how to fill out information; and for those who are non-literate, develop mechanisms for capturing information on events from them. Think of mechanisms such as identifying a family member who can assist with actual writing;
- Include methods such as monthly meetings and telephone calls to ensure tracking of CBS focal persons;
- Review and update procedures and methods of supportive supervision and feedback between the health facility and the community focal persons. Regular refresher trainings should also occur to ensure that community focal points understand which and how alerts should be reported;

- Describe the communication links between the community focal points and health facilities with the epidemic management committee that can be activated during an outbreak and for routine activities;
- Develop general, pictorial, and social mobilization materials for community, youth-based or school-based awareness;
- Conduct periodic meetings between the health facility surveillance focal points, CBS focal persons and community leaders, to discuss progress, issues, concerns and provide two-way feedback;
- 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 (an alert) to report (unexplained cluster of similar severe illnesses within one-week, high absenteeism at school) and how and when to report (for instance, through messages or mobile calls). The framework should be supported by a trained facility or dedicated Sub County staff and should be regularly evaluated.

Community representatives that can be members of CBS team

Community members who gain the trust of the community can be CBS focal persons. 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, community health workers, trained birth attendants, community or village health agents, or similar care providers, village leaders (religious, traditional or political), school teachers, veterinarians, health extension workers, chemical sellers, and traditional healers and in other communities, a respected non-health person such as the barber, shopkeeper or grandmother who regularly talks to community members are all 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 reporting suspect cases.

CBS supervision

The goal of supervision is to improve timeliness of 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. A surveillance officer or health facility manager in his or her locality should coordinate all activities for implementation by CBS. He or she will:

- Prepare a list of priority diseases, events 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;
- Develop, test and provide pictorial-based training materials and job aids;

- Develop an interactive training module;
- 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 feedback loops, which is a critical action for ensuring that CBS continues to work. Ensure that constructive and position supervision is done, where they are credited and praised for the good job done; and pinpoint areas for improvement;
- Disseminate simplified case definitions and alerts, using posters or any other latest intervention methods (banners, leaflets, etc. that have been shown to work in that area) to relevant places within the community, as appropriate;
- Monitor surveillance and response activities, including timeliness and completeness of reporting;
- Supervise activities of the CBS focal points, including fine-tuning understanding of the case definitions. In case CBS focal points are used for contact tracing, ensure that the facility-based person leads the process, in collaboration with the health facility-based person;
- 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 person.

Note: In some counties, CBS focal persons may be few and coordination might pose a challenge. A subcounty may then a CBS focal supervisor in a particular community (possibly from among the CBS FPs) to oversee a specific number of CBS focal persons. Community supervisors should be assigned clear roles, to avoid situations where they are the ones deciding if something is a health risk, based on notification.

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 community-based health workers, community volunteers, including traditional birth attendants, schoolteachers, pharmacists, who have relationships of trust with the local community. They are often located in remote areas where access to primary health care is scarce. Families often share information with a trusted and 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 available through the Internet) or radio reports before they are detected and reported by local health services.

- Traditional medicine, traditional health practitioners, healers, and shrine keepers. In some African countries, a large number of the population depends on traditional medicine for primary health care. Traditional medicine has been used for thousands of years, and these practitioners may constitute a valuable information source. Families with sick members often seek spiritual guidance at shrines known for healing.
- Alternative medicine (herbalists, for example), complementary medicine and nonconventional medicine, including health care practices that are not integrated into the dominant health care system.

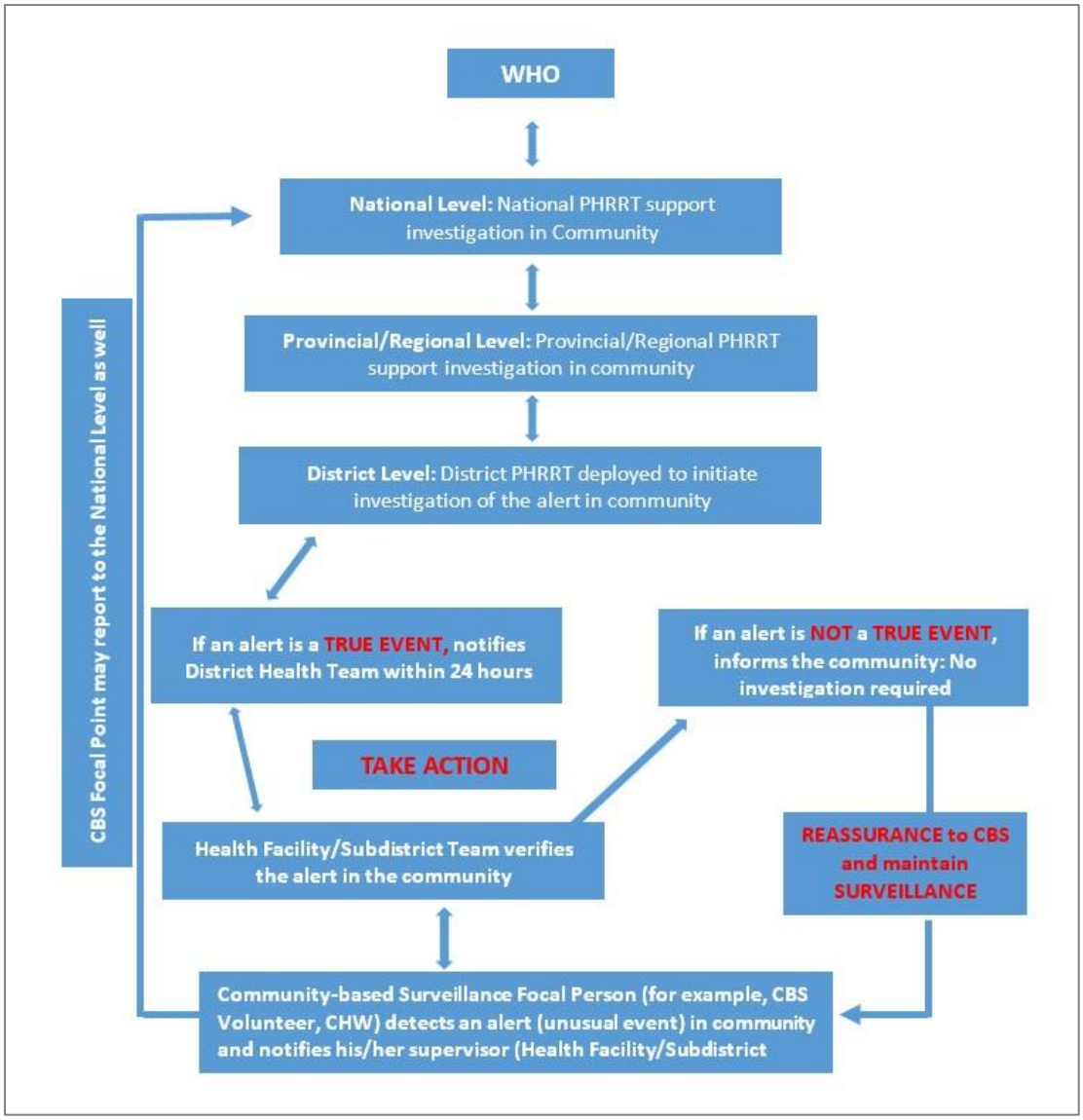


Figure 7: *Reporting Structure for Community alert and verification*

Note: Additional reference materials for community-based surveillance can be found in the Integrated Disease Surveillance and Response in the African Region: WHO Guide for establishing the Community-Based Surveillance and Response Program (August 2014) and International Federation of the Red Cross and Red Crescent Societies (IFRC): Community-Based Surveillance: guiding principles March 2017

Annex F: Required surveillance and Response core capacities as described in the IHR

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

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

- Community or primary public health response level
- Intermediate public health response levels
- National level

Local community or primary public health level response

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

Detect events involving disease or death above expected levels for the particular time and place in all areas within the country;

Report all available essential information immediately to the appropriate level of healthcare response (within 24 hours). At the community level, CBS focal persons shall report to the appropriate health facility in their respective catchment areas. At the primary public health response level, reporting shall be to the intermediate or national response level, depending on organizational structures.

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

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

Intermediate public health response levels

The intermediate public health level response core capacities requirement will need to be adapted to the context of each county.

The core capacity requirements at the intermediate level are:

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

National level: Assessment and notification

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

- Coordinate with World Organization for Animal Health focal person and the International Food Safety Authorities Network focal person and other sectors to ensure coordination in assessment and notification of events.
- Assess all reports of urgent events within 48 hours.
- Notify WHO immediately through the National IHR focal point when the assessment indicates that the event is notifiable under paragraph 1 of Article 6 of the IHR, and the decision instrument assessing and notifying events that may constitute a PHEIC in Annex 2 of the IHR, and inform WHO as required, pursuant to Article 7 and paragraph 2 of Article 9 of these Regulations.

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

- Coordinate by establishing a coordination mechanism which may include setting up a public health emergency operation center or a similar coordination structure, and activating the Incident Management System (See Sections 5 and 6 for more details);
- Determine rapidly the control measures required to prevent domestic and international spread;
- Provide support through specialized staff, laboratory analysis of samples (domestically or through collaborating centers) and logistical assistance (equipment, supplies and transport);
- Provide on-site assistance, as required, to supplement local investigations;
- Provide a direct operational link with senior health and other officials for rapid approval;
- Implement containment and control measures;
- Provide direct liaison with other relevant government ministries;
- Provide, by the most efficient means of communication available, links with hospitals, clinics, airports, ports, ground crossings, laboratories and other key operational areas for

the dissemination of information and recommendations received from WHO regarding events in the State party's own territory and in the territories of other States parties;

- Establish, operate and maintain a national public health emergency response plan, including the creation of a One Health team to respond to events that may constitute a public health emergency of international concern;
- Provide the foregoing on a 24-hour basis.

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

a) legislation;
b) policy and coordination;
c) surveillance;
d) preparedness;
e) response;
f) risk communications;
g) laboratory; and
h) human resources.

These eight components are all important for IDSR.

Annex G: Roles and Responsibilities of Various Actors in IDSR

Roles and responsibilities of a community-based surveillance focal person (community health worker)

Using lay, simplified case definitions to identify priority diseases, events, conditions or other hazards in the community, the focal person:

- Conducts household visits on a regular basis.
- Meets with key informants on a regular basis.
- Attends local ceremonies and events and follows up on any unusual occurrence, such as someone expected to show up but did not;
- Records priority diseases, conditions, or unusual health events in the reporting forms and tools (tally sheets) and reports immediately within 24 hours;
- Participates in verbal autopsies by performing interview questions prepared by the supervisor at the health facility;
- Sends rapid notification, to the nearest health facility and other relevant sectors, of the occurrence of unexpected or unusual cases of disease or death in humans and animals for immediate verification and investigation according to the International Health Regulations and in line with the IDSR strategy (within 24 hours);
- Involves local leaders in describing disease events and trends in the community;
- Raises the community's awareness about reporting and seeking care for priority diseases, conditions and unusual events;
- Supports health workers during case or outbreak investigation and contact tracing;
- Mobilizes local authorities and community members to support response activities;
- Participates in risk mapping of potential hazards and in training, including simulation exercises;
- Participates in containment and response activities in coordination with the Sub County level;
- Participates in response activities, which could include home-based care, social or behavior change of traditional practices, logistics for distribution of drugs, vaccines or other supplies. Providing trusted health education in a crisis is a useful contribution.
- Gives feedback to community members about reported cases, events and prevention activities;
- Verifies if public health interventions took place as planned, with the involvement of the community. Participates in meetings organized by sub-sub-county, sub-county, and higher-level authorities.

Responsibilities of health facility staff at point of entry

The health facility staff:

- Identify cases of priority diseases using the standard case definitions;
- Record case-based information and report for immediately notifiable diseases, conditions and events to the next level;
- Liaise with the Sub County on how to conduct immediate laboratory investigation of suspected cases;
- Deal with case treatment/referral;
- Prepare for and participate in outbreak investigation and response and case treatment;
- Report summary and case based (weekly report) data on time to the next level;
- Conduct simple data analysis (graphs, table, charts) at point of collection;
- Communicate diagnosis for outbreak-prone diseases to next level/community;
- Convene facility rapid response team
- Identify resources (human, financial, commodities, phone cards) and timeline for deployment.

Roles and responsibilities of surveillance officer at Sub County level

The role of the surveillance officer is to:

- Investigate and verify possible outbreaks, collect diagnostic samples, advise on treatment/prevention protocols;
- Prepare and analyze weekly surveillance reports and submits promptly to higher authorities;
- Ensure that surveillance sites maintain surveillance reports and ledgers/logbooks properly;
- Maintain a list of all reporting sites;
- Establish and maintain database of all trained and registered health care workers, who can serve as surveillance focal persons at the reporting sites as well as other CBS FPs;
- Ensure adequate supply of data collection and reporting tools at the surveillance reporting sites;
- Ensure that the IDSR standard case definitions for all the priority diseases are understood and used by health care workers at the site. Provide on-the-spot training if needed;
- Monitor the performance indicators (such as timeliness and completeness) of the IDSR, as stipulated in the IDSR guidelines;
- Periodically update graphs, tables and charts, and compare current data with previous ones, in months and quarters or even weeks or years (important for seasonal events) and makes recommendations for response;
- Personally provide weekly or monthly feedback to surveillance reporting sites, on implementation of the IDSR;
- Call the reporting sites to ensure that they report data on time;
- Conduct regular supportive supervision visits to surveillance sites, including health facilities, border entries and communities, and build their capacity to analyze and interpret their data,

to guide decisions. Sign and date the inpatient and outpatient record books, registries or phone entries, to document your visit and also write your recommendations for improvement;

- 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 health care facility in safe collection, packaging, storage and transport of laboratory specimens for confirmatory testing;
- Receive laboratory results from County /region and give to HCF;
- 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 come up with appropriate measures to improve data quality in the sub-county;
- Maintain a rumor logbook to record events for the surveillance site;
- Ensure cross-border (sub-county-sub-county) coordination and collaboration on surveillance issues and provide notification of any outbreaks in the neighboring sub-county. International or cross border notification should also be done if needed;
- Document the value added of IDSR and advocate to health management team to support IDSR activities;
- Participate in outbreak investigations and ensure that there is an updated register/line list. responsibilities of the Sub County Health Management Team

Roles and responsibilities of the Sub- County Health Management Team

The role of the Sub County Health Management Team is to:

- Liaise, through the Sub County Medical Officer, with the Sub County Executive Director/Sub County Commissioner/Regional Medical Officer on overall surveillance activities and plans;
- Support the Surveillance Officer at the Sub County level to implement planned activities;
- Ensure that surveillance activities are included in the Sub County Health Planning of overall activities;
- Liaise with the Sub County officials to mobilize funds (at Sub County level) for surveillance activities;
- Ensure timely release of funds for surveillance activities;
- Monitor IDSR performance and outputs of data analysis and monitoring tool;
- Participate in risk mapping of the Sub County and also in development of plan of action, based on the findings;
- During outbreaks, assist the Public Health Emergency Management committee in organizing the rapid response teams and ensure functionality (see Section 5 for details)
- Report finding of initial investigation to province/region;
- Participate in risk mapping and community assessment;
- Participate in establishment and ensure functionality of the emergency preparedness and response committees;
- Design, train, and set up implementation of community health education programs;

- Participate in and support response training for health care facility and community;
- Together with province/region, select and implement appropriate public health response;
- Plan timely community information and education activities;
- Document response activities;
- In case of outbreaks, send daily Sub County situation report.

Roles and responsibilities for other leaders at Sub County level

Political leaders such as village, ward or Sub County officers are very important people, who assist in fostering behavioral change on disease surveillance. They can play the following roles:

- Support any declarations of a public health emergency;
- Develop an inventory and identify local human/financial/logistics support. A quick response will often prevent spread;
- Ensure that principles of hygiene and sanitation are followed (environmental cleanliness, availability of latrines and their utilization, advocacy for drinking of clean and safe water, personal hygiene and sanitation measures, including hand washing);
- Report clusters of illness/death to a nearby health facility;
- Implement the bylaws to enhance 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 programs within the ward (IDSR is among the programs);
- Follow up on outbreaks, in collaboration with health care providers and other extension workers at ward level;
- Provide administrative back up to health care providers at ward and village level;
- Support enforcement of relevant legislations so as to prevent/control outbreak of infectious diseases;
- Supervise subordinates in ensuring that principles of hygiene and sanitation are followed;
- Ensure regular convening of public health care committee meetings (or set up one) when an outbreak occurs;
- Discuss disease patterns and their implications for action, as part of regular meetings with Sub County Medical Officer;
- Ensure that various committees are established and resourced to perform activities;
- Solicit resources from various sources to respond to disasters, including epidemics;
- Conduct advocacy on health matters in different campaigns carried out in the Sub County.

Responsibilities of the County Health Management Team

- Through the regional medical officer, liaise with regional/County commissioner as well as the chief medical officer/director general, health at national level, on overall surveillance activities and plans for the region and Sub County;
- Support the regional surveillance officer and Sub County surveillance officers to implement planned activities in their respective sub-counties;
- Ensure that surveillance activities are included in the region/provincial health planning of overall activities, as well as in respective sub-counties in their plans;
- Liaise with regional officers to mobilize funds for surveillance activities and ensure timely release of funds for surveillance and response activities for the entire region;
- Monitor Sub County IDSR performance and outputs of data analysis and monitoring tool;
- Participate in risk mapping of the Sub Counties and assist Sub Counties in developing plan of action, based on the findings;
- During outbreaks, assist the Public Health Emergency Management Committee in organizing the public health emergency regional rapid response teams and ensure functionality for both regional and Sub Counties levels (Refer to Section 5 for details);
- Report findings of initial investigation to national level;
- Participate in establishment and ensure functionality of the region and respective sub-county's emergency preparedness and response committees;
- Assist Sub Counties in risk mapping and community assessment;
- Assist Sub Counties in design and implementation of community health education programs;
- Participate in and support response training for Sub Counties;
- Assist Sub Counties in implementing appropriate public health response and also facilitate cross border Sub County surveillance and response initiatives

Role of Ministry of Health (MOH)/National level

- Set up a public health emergency operation center or similar coordination mechanism for coordination of preparedness and response activities of a public health event, including an incident management system, plans and procedures. Refer to Section 5 for details;
- Identify spokesperson and outline risk communication plan, including engagement of media, for sharing information before, during and after a public health emergency;
- Set standards, policies and guidelines for IDSR and update the emergency preparedness and response (EPR) plans based on simulations and After-Action reviews
- Assess available capacity at national level and rectify accordingly, while ensuring inclusion of surge capacity in the EPR plan;
- Identify domestic resources and mobilize and coordinate external support for implementation of 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;
- Provide national level data management and analytic support.

Role of WHO and other partners (United Nations agencies, CDC, USAID, PATH Médecins Sans Frontières, Red Cross)

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

Note: WHO plays a crucial role in coordinating other UN bodies and partners

Annex H: Guide for establishing surveillance and response system at POE

Purpose

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

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

Key partners

Ministry of Health, local government, airline and maritime authorities, port authorities, ministries responsible for communication or infrastructure, ministry of home affairs, WHO, International Organization for Migration, CDC and other key partners.

Key areas for surveillance and response at points of entry

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

Detection of ill travelers should include, at least, the following:

- Reporting of ill travelers or deaths on board international aircraft, ships or ground crossing points, who arrive at PoE stipulated by various guidelines;
- Port health officers and/or immigration officers who are present at select points of entry should be trained to recognize ill travelers they encounter during their routine assessments as well as to conduct an initial assessment of whether or not the illness poses a potential public health risk.
- Arrangements for the initial response to an ill traveler, if detected at a point of entry, should include, at least, the following:
- The ability to rapidly isolate the ill traveler from others, to avoid potential spread of disease.
- Standby health teams should be available, either in person or remotely by telephone, to conduct a rapid assessment of ill travelers detected at points of entry to determine if a communicable disease of public health concern is suspected.
- A healthcare facility located close to the point of entry should be designated to provide medical care as needed to severely ill travelers or those with a suspected communicable disease of public health concern. The designated facility should have adequate infection

prevention and control capacity to prevent spread of disease to staff or other patients, and diagnostic capacity, including access to laboratory diagnostics.

- Ambulance service or other safe transportation should be available to facilitate transport of ill travelers from the point of entry to the designated healthcare facility.

As needed, during a declared public health emergency affecting international travelers or with the potential for international spread of disease, there should also be capacity to implement at short notice, traveler screening or other border health measures, as recommended by the WHO.

Role of competent authorities

- Report all events and diseases with epidemic potential detected at points of entry to the next higher level immediately. Notification should also be done at the same time at the national level, with a copy of the report for the National IHR focal point, to assess use of the decision algorithm. If yellow fever is being suspected, include yellow fever vaccination for those cases originating from endemic or risk areas.
- If a traveler is a suspect case, immediately fill the passenger locator form/alert notification form. Ensure that the traveler/suspect case is kept separate from others, including family members, and transferred to the nearest holding room.
- If a suspected traveler is recognized and may not be symptomatic at the time of travel, be sure to take appropriate details and transfer that information to a nearby health facility for close monitoring. The health facility will liaise with the community focal point for close follow-up.
- Be responsible for monitoring baggage, cargo, containers, conveyances, goods, postal parcels and human remains departing and arriving from affected areas, so that they are maintained in such a condition that they are free of sources of infection or contamination, including vectors and reservoirs.
- Ensure, as far as practicable, that facilities used by travelers at points of entry are maintained in a sanitary condition and kept free of sources of infection or contamination, including vectors and reservoirs.
- Be responsible for the supervision of any de-ratting, disinfection, or decontamination of baggage, cargo, containers, conveyances, goods, postal parcels and human remains or sanitary measures for persons, as appropriate, under these 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 HCF as soon as possible, so that transport may be arranged.
- Ensure that all completed forms are stored securely. Create a database for events, if a computer is available. Keep a record or register of all events.

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

- Partners' meeting as soon as the epidemic or event is recognized

- Assessing the need for, and request support from, the regional or national emergency preparedness and response committee or rapid response teams when necessary
- Meeting regularly to assess the status of the outbreak or epidemic as indicated
- Regularly sharing surveillance data, addressing case counts (including zero cases if applicable) and status of contact tracing (if indicated)
- Sharing information on travel history of cases and identified contacts to facilitate coordinated response on both sides of the border
- Regularly reviewing the epidemic response and taking action to improve epidemic control actions as indicated
- Documenting and communicating epidemic response actions escalating notifications as needed.

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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES FOR KENYA

THIRD EDITION

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

November 2021

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

1.1 Introduction

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

1.2 Priority diseases, conditions and events included in the IDSR

The priority diseases for IDSR are selected based on the following criteria:
Notification requirement under IHR (2005): (for example, smallpox, poliomyelitis due to wild-type poliovirus, human influenza caused by a new subtype, SARS, COVID-19);
Diseases with highly epidemic potential to cause serious public health impact due to their ability to spread rapidly (for example, cholera, plague, yellow fever, viral hemorrhagic fever);
Principal causes of morbidity and mortality due to communicable diseases and conditions in Kenya (for example, malaria, pneumonia, diarrheal diseases, tuberculosis, HIV/AIDS, maternal deaths and injuries)
Priority non-communicable diseases or conditions (hypertension, diabetes mellitus, cancers, mental illnesses and malnutrition)
Effective control and prevention interventions are available for addressing the public health problems they pose (for example onchocerciasis, trypanosomiasis);
Diseases targeted for elimination or eradication by WHO for example, vaccine preventable diseases, leprosy, and guinea worm.

1.3 Detection of priority diseases, conditions and events

Health staff (human, animal, and environmental) conduct surveillance activities at all levels of the health system (public and private) so they can detect public health problems of concern in their communities. Community members also play an important role in surveillance by facilitating early detection and action to priority diseases, conditions and events. Community members should be oriented in surveillance so that they actively participate in detecting, reporting, responding to and monitoring health events related to humans or animals in their catchment area.

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

Surveillance priorities may 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 and/or animal health events which might have direct consequences to human health. An essential function of a public health surveillance system is to be vigilant in its capacity to detect not only known public health threats with established case definitions and formal reporting channels

but also events or hazards that are not specifically included in the formal reporting system. These may be events such as clusters of disease patterns or rumors of unexplained deaths.

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

(a) A person falls ill and seeks treatment from a health facility.

(b) High rate of hospital admission for the same diseases or symptoms

(c) Community members report unusual events or occurrences at local levels such as a cluster of deaths or unusual disease patterns to the health facility, or perhaps a school might report unusual absences due to similar signs and symptoms such as an influenza-like illness (ILI).

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

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

(f) Radio, television, newspapers, or social media (WhatsApp, Facebook, etc.) report a rumor of rare or unexplained events in the area with potential exposure for humans.

(g) Vital events records show an increase in maternal deaths.

(h) Unusual reports of illness among health-care workers.

(i) During analysis of the routine reports from all the facilities in the area, the sub county disease surveillance coordinator notices that other health facilities in the catchment area have also reported adult deaths due to bloody diarrhea which might signify that there might be an outbreak of *Bacillary dysenteriae* or *Escherichia coli*.

(j) 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.

(k) Environmental officers observed during assessment of water bodies, contamination which might be due to chemicals like lead, or due to other related chemicals due to mining activities, which might be an early trigger for public health interventions.

1.3 Indicator-Based Surveillance (IBS) and Event-Based Surveillance (EBS) approaches used to detect diseases, conditions and events

(a) The IDSR strategy uses both Indicator-Based Surveillance (IBS) and Event-Based Surveillance(EBS) approaches to detect diseases, conditions, and events.

(b) As part of efforts to increase the sensitivity of the surveillance system, the country y has established EBS system alongside the IBS to be rolled out to all levels of health care system,

that is, at the, county, sub county, health facility and community levels.

(c) The IBS involves the use of standard case definitions to identify diseases and conditions, whilst EBS uses Signals detection, triaging and verification to detect events. In contrast with case definitions that are narrow and disease-specific, EBS requires the detection and immediate reporting of Signals, which are broad and indicate the possibility of a serious public health event. Signals that are verified are classified as events.

(d) IBS and EBS are an integral component of the routine IDSR activities of the surveillance staff.

(e) Both IBS and EBS should use existing resources and infrastructure set aside for routine IDSR strategy.

1.4 Use of standard case definitions

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

Why do we need case definitions?

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

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

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

(a) **Suspected case:** clear clinical picture (meets the clinical case definition) that is, patient will have typical clinical features of the illness or indicative clinical picture, without being a confirmed or a probable case.
(b) **Probable case**: clear clinical picture (meets the clinical case definition) that is, patient will have typical clinical features of the illness or is linked epidemiologically to a confirmed case, but a laboratory sample cannot be taken because the case is lost or dead or a sample has been taken but was not available for laboratory testing or was not viable for sufficient laboratory testing.
(c) **Confirmed case**: a suspected or confirmed case verified by laboratory diagnosis .

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

In all outbreak scenarios, a more sensitive case definition to identify all suspected cases should 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 cause of the agent has been established, cases may continue to be classified as either suspected cases or confirmed cases. An additional tier classification, that is, "*Probable case definition*", may be added if officials feel that conducting laboratory tests on every patient with a consistent clinical picture and a history of exposure (for example, measles) is unnecessary.

Case definitions at the community level are usually simplified and are used to facilitate rapid detection of priority diseases, conditions or other hazards in the community. Case definitions at this level use key signs and symptoms to help the community to recognize when they should refer a person with these signs and symptoms for treatment and notify the health facility. Examples of how key signs and symptoms of community case definitions may be described are in **Annex 1B.**

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

1.5 Distribution of standard case definitions and registers to health facilities

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

Kenya has prepared and disseminated case definitions for diseases under surveillance in the form of a poster or as a small pocket-sized booklet. These tools reinforce the use of standard case definitions for detecting and reporting priority diseases, conditions and events.

Ensure that health facility personnel know the process for recording and reporting, including reporting sites. Also ensure that health facilities record rumors. Outpatient Department (OPD) or Inpatient Department (IPD) registers are used Surveillance officers should always liaise with the health information focal person to extract the priority disease of IDSR from the register

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

1.5.1 Distribution of community level case definitions

Provide information to community health workers, traditional healers, birth attendants, 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 simpler than those used in health facilities. A list of examples of case definitions for use at the community level is in **Annex 1B** of this section.

At the same time, emphasize the need to immediately refer people with the suspected disease or condition for treatment.
Provide them with procedures for reporting, including when and where to report; and ensure provision of necessary tools **See annex 2B**

Show them how to fill information and those who are non-literate develop mechanisms of capturing information of events from them. Think of mechanisms like identifying someone from the family member who can assist with actual writing.
Provide information to the community on priority diseases, using posters, lay case definitions and announcements during meetings.
Provide feedback methods and how timely information will be made available to the community, considering that this will encourage community members to participate in surveillance and response activities and also to understand the people in their community and changes in their health.

1.6 One Health approach in identification of events

One Health aims at applying a holistic approach in jointly detecting events and conducting risk assessment in responding to possible public health events occurring at the human-animal-environment interface. Detection of events under the One Health approach thus requires all levels from community, sub-county and county to national to strengthen collaboration across sectors, and jointly share responsibility of detecting events which might have an impact on the human health and their shared environment.

Examples of the One Health approach include detection of a rabid animal or reports of animal illness from the veterinary sector, which can facilitate investigations of human cases of disease or reports of human diseases which can be traced through exposure to chemical hazards within the environment.

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

All events detected should be shared with relevant sectors as part of the One Health approach

1.7 Event-based surveillance (EBS)

1.7.1 Background to event-based surveillance

The World Health Organization (WHO) African region (AFRO) Member States in a 1998 resolution adopted the Integrated Disease Surveillance and Response (IDSR) strategy for conducting public health surveillance. The IDSR strategy was initially an indicator-based (disease-specific) surveillance (IBS) system which tracks priority diseases and conditions of public health importance. The IBS utilizes standard/lay case definitions to detect and periodically, that is, immediately, weekly, monthly report on these priority diseases and conditions. The IBS is robust as it strengthens surveillance at all levels, incorporates laboratory confirmation, and embraces a one health approach. However, it has challenges in early warning as it only reported diseases/conditions; limited scope as it tracked only priority diseases; and low detection rates as it relied mainly on health facility sources of information. In view of these challenges, WHO through the revised IHR 2005 prompted Member States to implement both indicator-based (disease-based) surveillance (IBS) and event-based surveillance (EBS) to strengthen early warning and response (EWAR) mechanisms; and expand the surveillance scope to "all hazards". The WHO defines EBS as "***the organized collection, monitoring, assessment, and interpretation of mainly unstructured ad hoc information regarding health events or risks, which may represent an acute risk to human health***". Africa Centers for Disease Control and Prevention (Africa CDC) in 2018 developed an EBS framework for African Union (AU) Member States which defined four types of EBS based on their sources of information, that is: Community EBS, Health facility EBS, Hot lines, and Media scanning.

Kenya has been implementing the Integrated Disease Surveillance and Response (IDSR) strategy since the year 2001 with tremendous successes in terms of reporting rates and completeness of reports. Kenya revised the IDSR technical guidelines 1st edition in 2010 to include among other things the EBS as prompted by the IHR 2005. In March 2017, a Joint External Evaluation (JEE) revealed gaps in real-time surveillance capacity in Kenya, and implementation of EBS was recommended as a priority action to improve event reporting from the lowest cadres within health systems. The Ministry of Health (MOH) with the support of partners thus piloted EBS in Nakuru and Siaya Counties in 2019 and subsequently set up a structured county-by-county rollout of riding on existing health structures

1.7.2 Importance of event-based surveillance

Both the IBS and EBS are integral and complementary surveillance systems of the IDSR strategy. EBS compliments IBS by strengthening early warning and response (EWAR) mechanisms: Since most disease outbreaks are preceded by events, EBS is predictive and provides a lead time for putting measures in place to prevent or reduce adverse outcomes of the outbreak.

Event-based surveillance is better at detecting outbreaks early while IBS is better suited for monitoring disease trends over time and is useful for signaling the start of regular seasonal outbreaks of endemic disease. The EBS relies on multiple sources of information including both formal and informal sources at all levels making it very sensitive in detection of diseases and other condition of public health importance. This improves the detection rates as compared with the IBS that only relies on formal information often restricted to health facilities.

The EBS uses signals which are simple, broad, and non-disease specific statements capable of detecting both endemic/emerging and known/unknown diseases and conditions. This expands the scope of the surveillance system from priority diseases to "all hazards".

1.7.3 Types of event-based surveillance

Africa Centers for Disease Control and Prevention (Africa CDC) in 2018 developed an EBS framework for African Union (AU) Member States which defined four types of EBS based on their sources of information, that is: Community EBS, Health facility EBS, Hot lines, and Media scanning. Community EBS (CEBS) is detection and reporting of events that are likely to present threats to public health within a community, by community members and their networks including leaders, community members, shop keepers, FBOs, NGOs, learning institutions, administrators, healers, drug stores, etc.

Health facility EBS (HEBS) is detection and reporting of public health events at health facilities by the healthcare workers. A variant of HEBS for veterinary facilities (VEBS) enables detection and reporting of events from the animal health facilities by frontline animal health experts including veterinarians, animal health assistants, drug outlet managers, etc. A hotline/phone EBS (PEBS) involves the use of a dedicated telephone line that the public can use to make reports on public health events. Media scanning EBS (MEBS) involves searching for events of public health concern from diverse media sources. The rollout of PEBS and MEBS rides on existing public health emergency operation centers, call centers, and emergency telephone systems at the national, county, sub county, and health facility levels.

1.7.4 The Public Health Emergency Operation Center and Event-based Surveillance

An emergency operations center (EOC) is a physical location for the coordination of information and resources to support incident management activities. A Public Health Emergency Operations Center (PHEOC) is an EOC that specializes in the command, control, and coordination requirements of responding to emergencies that have public health consequences. A PHEOC serves to coordinate response activities to emergencies that presents acute threat to public health through mobilization and deployment of resources, and timely technical and operational decision machining.

The operation of the PHEOC is modal depending on the risk levels of the prevailing public health threat. It can exist in either a watch, alert, or response mode with different defined activities and defined incident-specific triggers/thresholds for transitioning from one mode to another. In the watch mode, routine day-to-day monitoring of public health threat indicators are undertaken by a few watch staff. If the watch mode thresholds are surpassed, the PHEOC moves to an alert mode which is a standby phase when a public health emergency is imminent based on a risk assessment. During this phase, the monitoring is intensified including investigations, and preparations are put in place in readiness for a response. When the alert mode thresholds are surpassed, the response mode is triggered during which the PHEOC is activated. The activation can be partial for lower-level responses or full for intensified response based on predefined criteria.

The watch mode is a crucial state with critical information requirements that enables the watchers to promptly detect public health threats or events to facilitate prompt response. The information in watch mode is obtained through two main strategies. First, the watchers track aggregate data or

information generated by the various routine surveillance systems against the defined outbreak thresholds. Secondly, during the watch mode, the PHEOC track public health threats through the hotline/phone EBS (PEBS) and media scanning EBS (MEBS) systems. These EBS systems strengthens the early warning and response (EWAR) capacities of the PHEOC by tracking events that are likely to predict a public health threat. Besides the PHEOCs the PEBS and MEBS should also be routinely undertaken at the call centers and alongside the health facility emergency telephone systems. The PHEOCs, call centers, and the health facility emergency telephone lines provide a rich a network of telephone networks for community engagement and provide structural opportunities onto which PEBS and MEBS can ride to effectively facilitate prompt detection and notification public health threats. The watchers at the PHEOCs, call center operators, and health facility emergency telephone line attendants must therefore capture EBS (PEBS and MEBS) data using the designated tools and promptly report to facilitate rapid response.

1.7.5 Process of event-based surveillance

Irrespective of the type, EBS takes place in the following six steps: signal detection, signal reporting, signal triage, signal verification, event risk assessment, and public health action (**Figure 8)**

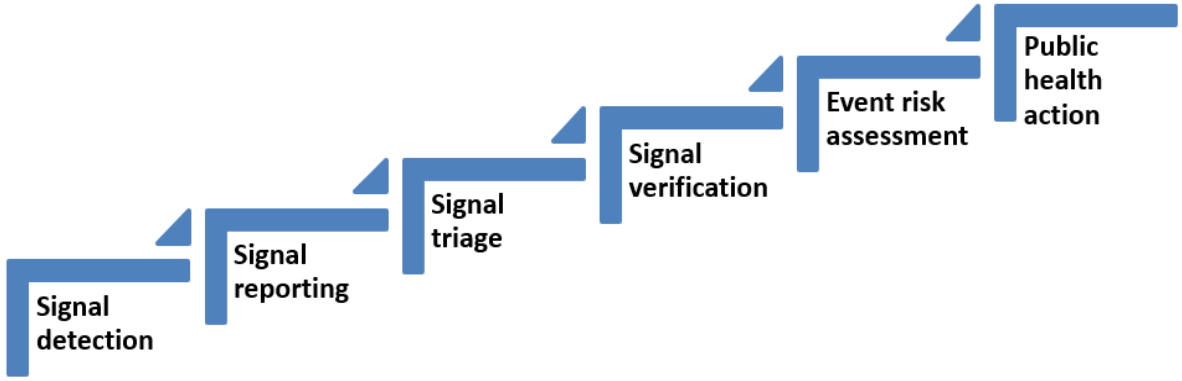


Figure 8: *Schematic diagram showing the process of event-based surveillance*

1.7.6 Event-based surveillance signals

A signal is a statement on observations used in EBS as an indicator of a possible public health threat (event) in the population. Signals are pre-defined by the MOH based on the public health priorities for routine EBS. A signal is the equivalent to a standard/lay case definitions used in IBS; however, signals are broader, simpler, and not disease specific**.**

From time to time, the MOH can revise the signal statements and lists for routine EBS to reflect the changing national priorities. Based on a prevailing surveillance need, a working EBS signal can be developed by the MOH or Counties to enhance surveillance for a specific event.

Table 2:*A comparison of standard case definition, lay case definition and signal using a measles example*

Standard case definition	**Lay case definition**	**Signal**
Suspected case: Any person with fever and maculopapular (non-vesicular) generalized rash and any one of the following: cough, coryza or conjunctivitis (red eyes) or any person in whom a clinician suspects measles ***Confirmed case***: A suspected case with laboratory confirmation or with epidemiological linkage to confirmed cases in an outbreak	Any person with hotness of the body and a rash	Two or more people presenting with similar signs and symptoms in a community within a week

Currently, the MOH has pre-defined six (6) signals for use in Community EBS, three (3) signals for use in Health facility EBS, and two (2) signals for use in Veterinary facility EBS. Both sets of signals are used in Hot lines and Media scanning EBS processes**.**

Table 3: *Lists of pre-defined signals for routine community, health facility, and veterinary event-based surveillance in Kenya, 2022*

Community EBS signals	Health facility EBS signals	Veterinary facility EBS
Two or more people presenting with similar signs and symptoms in a community within a week Any death in the community Any child under 15 years with sudden weakness of the legs or arms Increase in number of people older than 5 years with lots of watery diarrhea Increased sickness including abortions and/or deaths of animals (wild or domestic and poultry/ birds or fish) Any event that causes public health anxiety/concern	Two or more cases with similar symptoms and signs from the same community, social grouping, or function that required hospitalization within a week Any healthcare worker who develops signs and symptoms during/after caring for a patient with similar illness An increase in the number of patients (outpatients and inpatients); laboratory requests; prescriptions; etc. at the health facility	A cluster of animals with similar clinical signs from the same herd (farm, ranch, watering/feeding area, market, village/estate, etc.) that require treatment within a week Any animal health care worker/ handler who develops an illness suspected to have been contracted from a sick animal

1.7.7 Detection of event-based surveillance signals

Signal detection is the process of recognizing the presence of any of the pre-defined signals for public health events. In CEBS, the community health volunteers (CHVs) get signal information by either witnessing occurrences; receiving reports from community members and their networks; or eavesdropping on others' conversations. In HEBS, healthcare workers (HCWs) get signal information through history taking, clinical examination, laboratory tests, review of records/reports, monitoring prescriptions, tracking consumables, etc. and matching their information obtained with the pre-defined signals. For the hotlines, information is received through telephone calls while media scanning information is obtained from various media platforms such as print, electronic, and social media. The signal information that matches any of the pre-defined signals is considered detected.

1.7.8 Signal reporting

Signal reporting is the process of communicating information on detected signals to public health authorities at higher health service levels. Whereas reporting is a mandatory procedure at all the steps of the EBS process, emphasis is made on signal reporting because it is the initial reporting step necessary for M&E as EBS does not have zero reporting. All detected signals MUST be reported immediately (real-time). All types of EBS must identify a primary level focal person who will be responsible for receiving signal information. Signals can be reported using any agreed or available means including short message services (SMS), telephone calls, phone-based applications such as m-Dharura, web-based applications, emails, in person, paper-based reports, etc.

1.7.9 Triaging signals

Due to its high sensitivity, EBS is likely to generate signals for real and non-real events. Signal triage is the process of sorting out (filtering) reported signals to identify which ones are mostly likely to be real events. Triaging is done by the EBS focal person at the community or health facility

levels by reaching out to the person who has made the report and asking the following guiding sequential questions:
Does the reported information match any pre-defined EBS signal?
Is the information relevant for early warning (Is it on-going or recent?)
Has the signal not been reported previously (Not a duplicate)?
Any signal that gets a "YES" response to all the three questions is reported immediately for verification. If there is a "NO" response in any of the questions, the signal is noted and dropped from further follow up.

1.7.10 Signal verification

Verification is confirming if a signal is authentic/valid, that is, whether it is true or false. It can either be done by gathering additional information from where the reported signal is or considering the credibility of the source of signal. Information from formal sources is often valid and may not require gathering of additional information during verification. A signal that is verified true becomes an **event** while that which is verified false is noted and dropped from further steps. An event (signal verified true) is an occurrence that presents a threat to public health.

1.7.11 Event risk assessment

A vibrant EBS system generates a lot of events which require a rapid and sound criterion on whether to respond or monitor; and which event to resolve first when responding due to the limited resources. A rapid risk assessment is the systematic and on-going process of gathering, evaluating, and documenting information that will form the basis of the actions required to manage and minimize the negative consequences of a serious public health event. It is a process of determining the level of risk of an event poses to public health and recommending the appropriate response needed. Involves gathering and evaluating available information on the likelihood of the event occurring or continuing in the population and the consequences/severity associated with it if it happens.

Based on the information collected, the estimated level of likelihood and consequences are used to characterize the risk associated with the event. This assessment is subjective, that is, dependent on the assessor's perception on the likelihood and consequences. Tools such as risk characterization matrix can be used to guide in the characterization of risk (Figure 7). It is during risk assessment that EBS links with the IBS. The rapid risk assessment is led by the Sub County teams and supported by the County and National levels depending on the technical and resource implications. The first risk assessment of an event must take place within 48 hours of the detection of its signals.

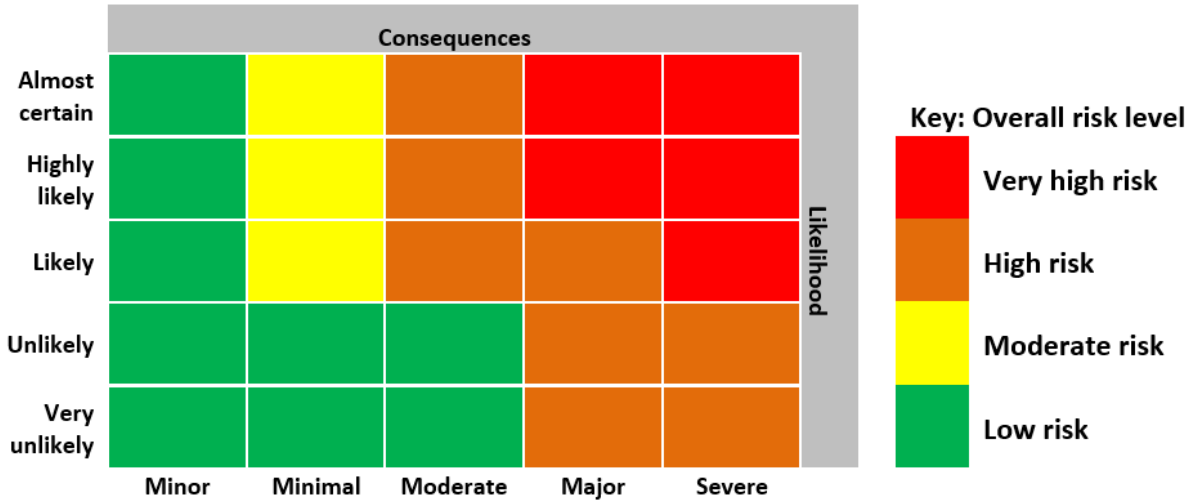


Figure 9: *Risk characterization matrix*

1.7.12 Public health action

The primary objective of EBS is to timely detect events that pose acute risk to human health to facilitate prompt further investigations and response. Public health action includes all the prevention and control activities including further investigations undertaken in response to an event based on the risk assessment recommendations. The type of response is informed by the overall risk level **(Table 4).**

Table 4: *Examples of public health actions based on the overall levels of risk*

Level of risk	**Suggested response**
Low risk	Managed according to standard/routine response protocols
Moderate risk	Specific monitoring or control measures are required: Enhanced surveillance, vaccination campaign, etc.
High risk	Attention of senior management needed; may need an incident management system; additional control measures to be put in place e.g., closure of livestock markets
Very high risk	Immediate action required at all times required; immediate senior management attention needed; additional control measures may include stringent actions e.g., lockdowns

1.7.13 Establishing of EBS

Irrespective of the type, the establishment of an event-based surveillance (EBS) system involves the following steps:

a) Identify public health priorities
b) Define the EBS signals for events

c) Map and advocate for resources for EBS
d) Define the functions and processes of EBS
e) Develop a data capture and reporting system
f) Develop a monitoring plan
g) Set up a coordination mechanism
h) Build capacities of EBS focal persons
i) Support the development of action plans
j) The details on establishing EBS system are contained on page 132

1.8 Laboratory Surveillance network

The laboratory focal persons at each level of the health system should maintain an updated list of the laboratories that have the capacity to perform required laboratory testing. A sample worksheet for listing national laboratories for confirming priority diseases and conditions is in Annex 1F of this section.

Provide information to all health facilities about the methods for transporting specimens including how to prepare, handle, ship and store the specimens. Make sure to disseminate information about packing and shipping infectious material as directed by national policy.
At healthcare facilities, sub county and county health system levels, the focus is on safe collection, handling, transportation and processing of specimens as well as giving prompt feedback.

The laboratory focal person should strengthen routine communication with identified laboratories that receive specimens from the health facility or sub county. The purpose of this routine contact is to strengthen communication between the health facilities in the sub county 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 county or sub county level laboratories within the network, the national level health authority will establish a memorandum of understanding (MOU) with laboratories outside the area or network that have the capacity for specific diagnostic procedures not available locally.

The national level should also support the laboratory through advocacy with high decision- makers in putting the mechanisms and structures in place to procure and enable quick access, when needed, to the necessary supplies to collect, handle, store, and ship specimens safely through the network.

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

1.8.1 Laboratory supplies, reagents and equipment

laboratories should be prepared and procure laboratory supplies in support of surveillance activities. All laboratories (public, radiological, Private, Vet, Food, research, etc) available in a geographical area should be engaged to maximize available services for surveillance. Each

surveillance unit should have a comprehensive list of laboratories and experts available for easy reference. Priority diseases, conditions and events of public health importance have been identified and confirmation

1.8.2 Laboratory procedures for confirming priority diseases and conditions

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

Standard operating procedures (SOPs) are among the most important documents in a diagnostic laboratory. Ensure that each laboratory has up-to-date written SOPs for all techniques performed in the laboratory. These procedures should be the same throughout a country's laboratory network so that each laboratory is performing tests in the same manner. These SOPs should also incorporate internal quality controls.

1.8.3 Laboratory quality assurance program

A quality assurance program (internal and external quality control) is the backbone of good laboratory performance. Laboratory quality assurance are important for building confidence it ensures the quality of the results diagnosed. Strengthening the laboratory quality assurance programs will allow improvement of the reliability and reproducibility of laboratory results. Coordinate with national laboratory and county authorities to establish activities for ensuring quality results from laboratories in the catchment area.

Laboratories should participate in external quality assurance programs and corrective actions implemented 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. Refer to WHO Stepwise Laboratory Quality Improvement Process towards Accreditation (SLIPTA) *[Checklist Version 2:2015 for Clinical and Public Health Laboratories for how to do SLIPTA assessment and http://apps.who.int/iris/handle/10665/204423*

Annexes to Section 1

Annex 1A: Standard case definitions for reporting suspected priority diseases conditions and events from the health facility to the sub-county
Annex 1B: Community level case definitions using key signs and symptoms
Annex 1C: Guide for establishing event-based Surveillance systems
Annex 1D: EBS reporting tools
Annex 1E: EBS logbook
Annex 1F: EBS Monitoring Framework
Annex 1G: EBS sensitization slides
Annex 1H: List of Sub-County Reporting Sites
Annex 1I: Laboratory Functions by Health System Level
Annex 1J: Responsibilities of Laboratory Focal Persons at all Levels
Annex 1K: List of National Laboratories for Confirming Priority Diseases and Conditions

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

The following standard case definitions are used by all health facilities for reporting suspected cases of priority diseases and conditions to the Sub-Counties level. Please refer to the disease-specific guidelines in section 11 for additional information for each of the priority diseases targeted for surveillance by WHO/AFRO which include action to be taken in response to alert and epidemic thresholds.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Acute Hemorrhagic 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 2 of the following; hemorrhagic or purpuric rash; epistaxis (nose bleed); hematemesis (blood in vomit); hemoptysis (blood in sputum); blood in stool; other hemorrhagic symptoms and no known predisposing factors for hemorrhagic manifestations OR clinical suspicion of any of the viral diseases. **Confirmed case**: A suspected case with laboratory confirmation or epidemiologic link to confirmed cases or outbreak. Note: During an outbreak, case definitions may be changed to correspond to the local event. It is important to note that during outbreaks, most cases might not show hemorrhagic manifestation, a proper history taking is crucial.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Acute Jaundice	**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 colored urine, right upper quadrant tenderness of body), **AND/OR** (iii) Raised alanine aminotransferase (ALT) levels more than ten times the upper limit of normal ***Confirmed case***: A suspected case that is laboratory confirmed by virus specific biomarkers: **Acute Hepatitis A**: 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, 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

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Adverse events following immunization (AEFI)	Any unwanted 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 unfavorable or unintended sign, abnormal laboratory finding, symptom or disease.
Anthrax	**Suspected case:** Any person with acute onset characterized by any of the following: : **Cutaneous** : Any person with skin lesion evolving over 1 to 6 days from a papular through a vesicular stage, to a depressed black eschar invariably accompanied by edema that may be mild to extensive. **Gastro-intestinal:** Any person with abdominal distress characterized by nausea, vomiting, anorexia and followed by fever **Pulmonary (inhalation):** any person with brief prodromal resembling acute viral respiratory illness, followed by rapid onset of hypoxia, dyspnea and high temperature, with X-ray evidence of mediastinal widening **Meningeal:** Any person with acute onset of high fever possibly with convulsions, loss of consciousness, meningeal signs and symptoms; commonly noted in all systemic infections, but may present without any other clinical symptoms of anthrax. **AND** has an epidemiological link to confirmed or suspected animal cases or contaminated animal products **Confirmed Cases** A confirmed case of anthrax in a human can be defined as a clinically compatible case of cutaneous, inhalational or gastrointestinal illness that is laboratory-confirmed by: 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.*

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Brucellosis	**Suspected case:** Acute or insidious onset of fever AND ONE OR MORE of the following: night sweats, arthralgia, headache, fatigue, anorexia, myalgia, weight loss, arthritis/spondylitis, meningitis, or focal organ involvement (endocarditis, orchitis/epididymitis, hepatomegaly, splenomegaly). **Confirmed case:** A suspected case with confirmatory laboratory diagnosis by way of: culture and identification of Brucella spp. or evidence of a fourfold or greater rise in Brucella antibody titer or molecular
Chikungunya	**Suspected case**: Any person with acute onset of fever >38.5°C and severe arthralgia/arthritis not explained by other medical conditions. **Confirmed case**: A suspected case with laboratory confirmation.
Cholera[19]	**Suspected cholera case**: In areas where a cholera outbreak has not been declared: Any patient aged two years and older presenting with acute watery diarrhea and severe dehydration or who have died from acute watery diarrhea. In areas where a cholera outbreak is declared: any person presenting with or dying from acute watery diarrhea. **Confirmed cholera case**: A suspected case with Vibrio cholerae O1 or O139 confirmed by culture or PCR polymerase chain reaction and, *in countries where cholera is not present or has been eliminated, the Vibrio cholerae O1 or O139 strain is demonstrated to be toxigenic.*

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
COVID-19	**Suspected case:** A person who meets the clinical criteria: Acute onset of fever AND cough; OR Acute onset of ANY THREE OR MORE of the following signs or symptoms: fever, cough, general weakness/fatigue, headache, myalgia, sore throat, coryza, dyspnea, anorexia/nausea/vomiting, diarrhea, altered mental status. **OR** A patient with severe acute respiratory illness (SARI: acute respiratory infection with history of fever or measured fever of ≥ 38 °C; and cough; with onset within the last 14 days; and who requires hospitalization **Probable Case:** A patient who meets clinical criteria above AND is a contact of a probable or confirmed case, or linked to a COVID-19 cluster **OR** A suspect case (described above) with chest imaging showing findings suggestive of COVID-19 disease **OR** A person with recent onset of loss of smell or loss of taste in the absence of any other identified cause **OR** Death, not otherwise explained, in a person with respiratory distress preceding death AND who was a contact of a probable or confirmed case or linked to a COVID-19 cluster **OR** E**. Confirmed Case:** A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Dengue Fever	**Dengue Fever Suspected case:** Any person with acute febrile illness of 2-7 days duration with 2 or more of the following: headache, retro- orbital pain, myalgia, arthralgia, rash, hemorrhagic manifestations, leukopenia. **Dengue fever probable case** **Dengue Fever 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 Hemorrhagic Fever**: A probable or confirmed case of dengue with bleeding tendencies as evidenced by one or more of the following: positive tourniquet test; petechiae, ecchymoses or purpura; bleeding: mucosa, gastrointestinal tract, injection sites or other; hematemesis 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 hematocrit for age and sex, 20% drop in hematocrit following volume replacement therapy compared to baseline, signs of plasma leakage (pleural effusion, ascites, hypo-proteinemia). **Dengue Shock Syndrome:** All the above criteria, plus evidence of circulatory failure manifested by rapid and weak pulse, and narrow pulse pressure (≤ 20 mm Hg) or hypotension for age, cold, clammy skin and altered mental status.
Diabetes	Suspected new case: Any person presenting with the following symptoms: Increased thirst Increased hunger Frequent urination **Confirmed new case**: Any person with a fasting 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

Priority Diseases and Conditions	
Disease/Condition	Standard case definition for suspected cases
Diarrhea with blood	Suspected case: A person with (abdominal pain) and diarrhea with visible blood in stool. Confirmed case: Suspected case with stool culture positive for Shigella dysenteriae type 1.
Diarrhea with Dehydration in children less than 5 years of age	Suspected case: Passage of 3 or more loose or watery stools in the past 24 hours with or without dehydration and: Some dehydration -- two or more of the following signs: restlessness, irritability; sunken eyes; thirsty; skin pinch goes back slowly, or Severe dehydration -- two or more of the following signs: lethargy or unconsciousness; sunken eyes; not able to drink or drinking poorly; skin pinch goes back very slowly. Confirmed case: Suspected case confirmed with stool culture for a known enteric pathogen. Note: Laboratory confirmation of specific agent causing outbreak is not routinely recommended for reporting purposes.

Dracunculiasis	***Rumor*** ***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 case of guinea-worm disease in 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 United States Centers for Disease Control and Prevention (CDC). 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.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Ebola or Marburg virus diseases	***Suspected case***: Illness with onset of fever and no response to usual causes of fever in an area, and at least one of the following signs: bloody diarrhea, bleeding from gums, bleeding into skin (purpura), bleeding into eyes and urine. ***Confirmed case***: A suspected case with laboratory confirmation (positive IgM antibody, positive PCR or viral isolation), or epidemiologic link to confirmed cases or outbreak **In Outbreak setting, the following standard case definitions may guide appropriate detection of cases:** ***Suspected case:*** Any person, alive or dead, suffering or having suffered from a sudden onset of high fever and having had contact with: - a suspected, probable or confirmed Ebola or Marburg case; - a dead or sick animal (for Ebola) - a mine (for Marburg) OR Any person with sudden onset of high fever and at least three of the following symptoms: - headaches - lethargy - anorexia / loss of appetite - aching muscles or joints - stomach pain - difficulty swallowing - vomiting - difficulty breathing - diarrhea - hiccups; OR Any person with inexplicable bleeding; OR Any sudden, inexplicable death; ***Probable case:*** Any suspected case evaluated by a clinician; OR Any deceased suspected case (where it has not been possible to collect specimens for laboratory confirmation) having an epidemiological link with a confirmed case Note: if laboratory specimens are collected in due time during the illness, the preceding categories are reclassified as "laboratory confirmed" cases and "non-case". ***Laboratory confirmed case***: Any suspected or probably cases with a positive laboratory result. Laboratory confirmed cases must test positive for the virus antigen, either by detection of virus RNA by reverse transcriptase-polymerase chain reaction (RT- PCR), or by detection of IgM antibodies directed against Marburg or Ebola.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Epilepsy	**Suspected case**: Any person with one epileptic seizure **Suspected new case:** Report only the first diagnostic of the case in the health center **Confirmed case**: Any person with recurrence of, at least, two epileptic seizures. A positive response to treatment with any AED strengthens the hypothesis of a confirmed case. Epileptic seizures can last for 30 seconds to 3 minutes. When they intricate without a pause, they can lead to *status epilepticus*.
Foodborne Illnesses	**A foodborne illness** is suspected when 2 or more people present with similar symptoms and who consumed common food or drink A foodborne illness is defined according to the specific agent causing the disease (for example, cholera, hepatitis A, salmonellosis, shigellosis). **A confirmed foodborne illness** is a laboratory confirmed case of a specific agent with a link to a common food or drink source.
Human influenza caused by a new subtype	**Suspected H5NX case**: Any person presenting with unexplained acute lower respiratory illness with fever (>38 ºC) and cough, shortness of breath or difficulty breathing **AND** one or more of the following exposures within the 7 days prior to symptom onset: Close contact (within 1 meter) with a person (e.g., caring for, speaking with, or touching) who is a suspected, probable, or confirmed H5NX case; Exposure (e.g., handling, slaughtering, de-feathering, butchering, preparation for consumption) to poultry or wild birds or their remains or to environments contaminated by their feces in an area where H5NX infections in animals or humans have been suspected or confirmed in the last month;

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
	Consumption of raw or undercooked poultry products in an area where H5NX infections in animals or humans have been suspected or confirmed in the last month; Close contact with a confirmed H5NX infected animal other than poultry or wild birds; Handling samples (animal or human) suspected of containing H5NX virus in a laboratory or other setting. **Confirmed H5NX case**: A person meeting the criteria for a suspected case **AND** positive laboratory results from a WHO accredited laboratory NB: ***Include IHR case definition for reporting of human infection with a novel influenza virus*** ***For some zoonotic influenza subtypes, specific cases definitions are existing such as for H5NX and H7N9***
Hypertension	**Suspected new case at first visit:** Any individual presenting with a resting blood pressure measurement (based on the average of 3 readings) at or above 140 mm Hg for systolic pressure, or greater than or equal to 90 mm Hg for diastolic pressure. **Confirmed case:** Any individual presenting on at least two occasions with a resting blood pressure measurement (based on the average of 3 readings) at or above 140 mm Hg for systolic pressure, or greater than or equal to 90 mm Hg for diastolic pressure
Influenza-like Illness (ILI)	An acute respiratory infection in a child or adult with: Sudden onset of fever > 38 ºC 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 center*** ***Report only the first diagnostic of the case in the health center***

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Road Traffic Injuries	**Road Traffic injuries s:** Any person who has sustained an injury as a result of a road traffic accident presenting for the first time **Road traffic fatality:** Any person killed immediately or dying within 30 days as a result of injury secondary to road accident.
Kala azar (Visceral Leishmaniasis)	**Suspected case of Visceral leishmaniasis:** Any person living or has traveled in an endemic area and complains of fever for more than two weeks, accompanied by abdominal swelling (splenomegally), general weight loss and in whom malaria has been ruled out or has not shown clinical response to effective anti-malarial drugs. **Suspected case of Cutaneous leishmaniasis:** Any person living in an endemic area who presents with skin nodules or lesions that have lasted for more than two weeks. **Confirmed** Case of Visceral leishmaniasis: A person who has fever of more than two weeks, splenomegaly and 'rK39' test is positive. **Confirmed Case of cutaneous leishmaniasis:** A person with skin nodules or lesion on the skin and amastigotes stage of the parasite has been confirmed in the tissue by microscopy.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Leprosy	**Suspected case**: A person showing one of three cardinal signs of leprosy: hypo-pigmented or reddish skin lesion, loss or decrease of sensations in skin patch, enlargement or peripheral nerve. **Confirmed case:** A person showing at least two cardinal signs of leprosy and who has not completed a full course of treatment with Multi Drug Therapy (MDT).
Lymphatic Filariasis	**Suspected case**: Resident of an endemic area with a clinical sign of hydrocoele or lymphoedema for which other causes of these findings have been excluded. **Confirmed case:** A person with positive laboratory diagnosis of microfilaremia in blood smear, filarial antigenemia or positive ultrasound test.
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 hospitalized with severe febrile disease with accompanying vital organ dysfunction diagnosed clinically ***Confirmed Severe malaria*** Any patient hospitalized with *P. falciparum* asexual parasitemia as confirmed by laboratory tests with accompanying symptoms and signs of severe disease (vital organ dysfunction) diagnosed through laboratory.

Malnutrition	**Malnutrition in children:** Children under five who are underweight (indicator: weight for age<-2Z Score) Children 6 to 59 months with MUAC<11.5 cm (high risk of mortality) Bilateral pitting oedema **Malnutrition in pregnant women:** Pregnant women giving 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).

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Maternal Deaths	The death of a woman while pregnant or within 42 days of the delivery or termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes.
Measles	**Suspected case**: Any person with fever and maculopapular (non-vesicular) generalized rash and cough, coryza or conjunctivitis (red eyes) or any person in whom a clinician suspects measles. **Confirmed case**: A suspected case with laboratory confirmation (positive IgM antibody) or epidemiological link to confirmed cases in an outbreak.
Middle East Respiratory Syndrome Coronavirus (MERS-CoV)	**NB Several case definitions exist, depending on whether a person resides in Middle East or not. Please refer Section 11 for details** **Suspected case:** A person with an acute respiratory infection, with history of fever and cough and indications of pulmonary parenchymal disease (e.g. pneumonia or ARDS), based on clinical or radiological evidence, and who has traveled within 14 days before onset of illness to the Middle East or countries where MERS-CoV is known to be circulating in dromedary camels or where human infections have recently occurred. Individuals with acute respiratory illness of any degree of severity who, within 14 days before onset of illness, had any of the following exposures (**Note:** see section on Recommendations for testing in clusters associated with health care settings): close physical contact with a confirmed or probable case of MERS-CoV infection, while that patient was ill; a healthcare facility in a country where hospital-associated MERS-CoV infections have been reported; direct contact with dromedary camels or consumption or exposure to dromedary camel products (raw meat, unpasteurized milk, urine) in countries where MERS-CoV is known to be circulating in dromedary camel populations or where human infections occurred as a result of presumed zoonotic transmission. **Confirmed case** A person with laboratory confirmation of MERS-CoV infection, irrespective of clinical signs and symptoms.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Bacterial Meningitis	***Suspected meningitis case:*** Any person with sudden onset of fever (>38.5 °C rectal or 38.0 °C axillary), and neck stiffness or other meningeal signs, including bulging fontanelle in infants. ***Probable meningitis case:*** Any suspected case with macroscopic aspect of cerebrospinal fluid (CSF) turbid, cloudy or purulent; or with a CSF leukocyte count >10 cells/mm^3 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 meningitis case*** Any suspected or probable case that is laboratory confirmed by culturing and or PCR (i.e., polymerase chain reaction) a bacterial pathogen (Neisseria spp, Streptococcus spp, etc.from CSF or blood. samples.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
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. **Confirmed case**: No laboratory confirmation recommended.
New HIV Case	WHO/AFRO recommends that countries use either Bangui or Abidjan HIV/AIDSR case definitions. A positive ELISA for confirming HIV and a rapid test for confirming the positive results are sufficient for an epidemiologic case definition for HIV Infection.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Onchocerciasis	**Suspected case**: In an endemic area, any person with fibrous nodules in subcutaneous tissues. **Confirmed case**: A suspected case that is laboratory confirmed by presence of one or more of the following: microfilariae in skin snips, adult worms in excised nodules, or typical ocular manifestations (such as slit-lamp observations of microfilariae in the cornea, the anterior chamber, or the vitreous body).
Neonatal deaths	**A Perinatal death** is defined as the death of a baby of at least 28 weeks of gestation and/or 1,000 g in weight and early neonatal death (the first seven days after birth) **Early neonatal** death is defined as any death of a live new born occurring before the first 7 complete days of life. Day 1 is clinically considered the first day of life.

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
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 area within the previous 10 days. ***Confirmed case***: Any person with Suspected case confirmed by identification of *Yersinia pestis by negative staining,or isolation* from aspiration of buboes, and or blood specific sero-conversion or rapid diagnostic test detecting the Ag F1 in endemic areas
Poliomyelitis (Acute flaccid paralysis)	**Suspected case:** Any child under 15 years of age with acute flaccid paralysis or any person with paralytic illness at any age in whom the clinician suspects poliomyelitis. **Confirmed case**: A suspected case with virus isolation in stool.
Human Rabies	**Suspected:** A person with one or more of the following: headache, neck pain, nausea, fever, fear of water, anxiety, agitation, abnormal tingling sensations or pain at the wound site, when contact with a rabid animal is suspected. **Confirmed:** A suspected case that is laboratory confirmed

Rift Valley Fever (RVF)	**Suspected Case** **Early Disease** Acute febrile illness (axillary temperature >37.5 ºC or oral temperature of >38.0ºC) of more than 48 hours duration that does not respond to antibiotic or antimalarial therapy, and is associated with: Direct contact with sick or dead animal or its products **AND / OR** Recent travel (during last week) to, or living in an area where, after heavy rains, livestock die or abort, and where RVF virus activity is suspected/confirmed **AND / OR** Abrupt onset of any 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, diarrhea OR abdominal pain with one or more of the following: - Severe pallor (or Hb < 8 gm/dL)

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Rift Valley Fever, continued	-Low platelets (thrombocytopenia) as evidence by presence of small skin and mucous membrane hemorrhages (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 hemorrhage, 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).

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

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Severe Acute Respiratory Syndrome (SARS)	**Suspected case of SARS** is an individual with: 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 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 of SARS***: An individual who tests positive for SARS-CoV infection by the WHO recommended testing procedures.
Severe Pneumonia in Children under 5	**Clinical case definition (IMCI) for pneumonia:** A child presenting with cough or difficult breathing and: 50 or more breaths per minute for infant age 2 months up to 1 year 40 or more breaths per minute for young child 1 year up to 5 years. ***Note:*** *A young infant age 0 up to 2 months with cough and fast breathing is classified in IMCI as "serious bacterial infection" and is referred for further evaluation.* **Clinical case definition (IMCI) for severe pneumonia:** A child presenting with cough or difficult breathing and any general danger sign, or chest 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 sub-counties.
Sexually transmitted infections	**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 (

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
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.
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 isolation of trypanosomes in blood lymph nodes or cerebrospinal fluid. or Card Agglutination Trypanosoma Test (CATT)

Tuberculosis	**Suspect case** Any person with cough of 2 or more weeks and/or fever of 2 or more weeks and/or noticeable weight loss and/or contact with TB patient or a child who is not growing well **<u>Probable case</u>** Any person who presents with unexplained weight loss (more than 3Kgs), OR excessive night sweats for ≥3 weeks, OR persistent fever for ≥2 weeks, **OR** poor weight gain in the last 1 month for children > 5 years. the above may be accompanied with respiratory symptoms of: coughing for longer than 2 weeks, and or coughing up blood or chest pain or shortness of breath or ±contact of bacteriologically confirmed TB patient **Confirmed TB** **confirmed TB:** Any person in whom mycobacteria TB is positive in a biological specimen by: smear microscopy or smear from any other biological specimen, **OR** culture, **OR** Nucleic Acid Amplification Tests e.g., Xpert MTB/RIF, TB LAMP, OR any other WHO recommended new diagnostics e.g., TB LAM for PLHIV with CD4<200 OR HIV positive who is critically ill1 **Clinically diagnosed TB:** Any person who meets the presumptive TB criteria but does not fulfil the criteria for bacteriological confirmation and has been diagnosed with active TB by a clinician or other medical practitioner who has decided to give the patient a full course of TB

[1] Respiratory rate > 30/minute, Temperature of > 39°C, heart rate > 120/minute and unable to walk unaided

[2] Clinically diagnosed cases subsequently found to be bacteriologically positive (before or after starting treatment) should be reclassified as bacteriologically confirmed

Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Tuberculosis	**Monoresistance: R**esistance to one first-line anti-TB drug only. **Polydrug resistance:** Resistance to more than one first-line anti-TB drug (other than both isoniazid and rifampicin). **Multidrug resistance TB (MDR-TB):** TB resistant to at least both isoniazid and rifampicin **Rifampicin Resistance:** resistance to rifampicin detected using phenotypic or genotypic methods, with or without resistance to other anti-TB drugs. It includes any resistance to rifampicin, whether monoresistance, multidrug resistance, polydrug resistance or extensive drug resistance **Pre-XDR-TB:** TB caused by Mycobacterium tuberculosis (M. tuberculosis) strains that fulfil the definition of MDR/RR-TB and that are also resistant to any fluoroquinolone (either levofloxacin or moxifloxacin or both) **XDR-TB:** TB caused by Mycobacterium tuberculosis (M. tuberculosis) strains that fulfil the definition of MDR/RR-TB and that are also resistant to any fluoroquinolone (either levofloxacin or moxifloxacin or both) and at least one additional Group A drug (either bedaquiline or linezolid or both)
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 diarrhea. **Confirmed case:** Suspected case confirmed by isolation of *Salmonella typhi* from blood, bone marrow, bowel fluid or stool.

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
Priority Diseases and Conditions	
Disease/Condition	**Standard case definition for suspected cases**
Yellow Fever continued	**Confirmed case:** **A suspected cases with Laboratory confirmation** with either of the following results; Detection of YF-**specific*** IgM Detection of four-fold increase in YF IgM and/or IgG antibody titres between acute and convalescent serum samples Detection of YFV-**specific*** neutralizing antibodies ***YF-specific means that antibody tests (such as IgM or neutralizing antibody) for other prevalent flavivirus are negative. This testing should include at least IgM for Dengue and West Nile and may include other flavivirus depending on local epidemiology.*** **OR** One of the following Detection of YF virus genome in blood or other organs by PCR Detection of yellow fever antigen in blood, liver or other organs by immunoassays Isolation of the yellow fever virus

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

Inform community leaders, community health workers, traditional healers, birth attendants, and health workers who conduct outreach activities in hard-to-reach areas about the priority diseases and conditions under surveillance in your area. Use key signs and symptoms of case definitions which have simple language and are easier to understand than the IDSR health facility case definitions. The following are examples of some of selected case definitions which can be used to help the community to recognize the diseases and refer a person with these signs for treatment and notify the health facility.

Priority Diseases and Conditions	
Disease/Condition	**Community case definition**
Acute Flaccid Paralysis (AFP)	Any child under 15 years old with a sudden onset of weakness and /or inability to use any part of the body but not due to trauma
Acute watery diarrhea	Any person with 3 or more loose stools within the last 24 hours
Acute Hemorrhagic Fever Syndrome	Any person who has an unexplained illness with fever and bleeding or who died after an unexplained severe illness with fever and bleeding.
Adverse event following immunization (AEFI)	Any unusual event that follows immunization
Cholera	Any person aged 2 or more years with lots of watery diarrhea
COVID-19	Any person with acute onset of fever and any one of the following, cough, runny nose, sore throat, general malaise, loss of taste, smell or body aches
Diarrhea in children less than 5 years of age	Any child who has three or more loose or watery stools in the past 24 hours with or without dehydration
Diarrhea with blood (Dysentery)	Any person with diarrhea, stomach pain and visible blood in the stool
Guinea Worm (Dracunculiasis)	Any person presenting with a wound on the skin living in an endemic area or risk areas of Guinea worm, with a worm coming out
Hepatitis	Any person with fever and yellowing in the white part of the eyes
Animal Bite (potential rabies)	Any person who is bitten by a dog or any other animal
Influenza-like Illness (ILI)	Any person with fever and cough or throat pain or runny nose

Priority Diseases and Conditions	
Disease/Condition	**Community case definition**
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
Measles	Any person with fever and rash
Meningitis	Any person with fever and neck stiffness
Maternal death	The death of a woman while pregnant or within 42 days after delivery
Neonatal death	Any death of a live new born occurring before the first 28 complete days of life
Neonatal tetanus	Any new born who is normal at birth, and then after 2 days, becomes stiff and unable to suck or feed or has convulsions/fits.
Riverblindness (Onchocerciasis)	Any person in an endemic area with fibrous nodules under the skin
Plague	Any person with painful swelling under the arms or in the groin area. In an area known to have plague, any person with cough, chest pain and fever.
Pneumonia	Any child less than 5 years of age with cough and fast breathing or difficulty in breathing.
Rabies (Human)	Any person with a sense of apprehension, headache, fever, malaise and changes in sense of touch on the site of an animal bite. Excitability and fear of water are frequent symptoms
Sexually transmitted infections (STIs)	Any person male or female who has a urethral/vaginal discharge or genital sores or pain
Tuberculosis	Any person with cough for 2 weeks or more
Typhoid fever	Any person with a prolonged fever during the previous 3 weeks or more

Priority Diseases and Conditions	
Disease/Condition	**Community case definition**
Viral hemorrhagic fevers	Any person who has fever and two or more other symptoms (headache, vomiting, runny stomach, weak in the body,) 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, weak in the body, yellow eyes) or who died after serious sickness with fever or bleeding
Public health events	Use the following community event-based surveillance signals: Two or more people presenting with similar signs and symptoms in a community within a week Any death in the community Any child under 15 years with sudden weakness of the legs or arms Increase in number of people older than 5 years with lots of watery diarrhea Increased sickness including abortions and/or deaths of animals (wild or domestic and poultry/ birds or fish) Any event that causes public health anxiety/concern

Annex 1C: Guide for establishing event-based Surveillance systems

Principles of establishing event-based surveillance

The EBS implementation model in Kenya allows establishing the system using either a multi-sectoral and whole country (national); or a sector-by-sector and region-by-region (county-by-county) approaches. The model also allows the options of either implementing all the types of EBS concurrently or through starting with one type then introducing others later. The EBS being an emerging field with limited information and resource intensive in rollout, a multisectoral, region-by-region, and type-by-type implementation strategy is recommended to the MOH, County Departments of Health, and other sectors and agencies involved in the implementation to provide an opportunity to learn and apply lessons as implementation is cascaded.

Based on the source of information, there are four forms of EBS, that is: community EBS (CEBS), health facility EBS (HEBS), hotlines and media scanning. The strengths of each of the four forms of EBS vary with the level of service delivery; that is, CEBS is suited for the community, the HEBS for health facility, and hotlines and media scanning for the National, County and Sub County levels. Irrespective of the level at which EBS is established, the other levels will play a critical role in supporting the success in the implementation and operation.

The MOH, County Departments of Health, and/or agencies responsible for public health surveillance will ensure the establishment of EBS system alongside the IBS. The establishment of EBS system should consider current and future workforce, resources, and infrastructure to ensure sustainability. One health approach should be embraced when establishing an EBS system. The different types of EBS should be established at levels where they are most impactful.

Steps in establishing an event-based surveillance system

Irrespective of the type, the establishment of an event-based surveillance (EBS) system involves the following steps:

a) Identify public health priorities
b) Define the EBS signals for events
c) Map and advocate for resources for EBS
d) Define the functions and processes of EBS
e) Develop a data capture and reporting system
f) Develop a monitoring plan
g) Set up a coordination mechanism
h) Build capacities of EBS focal persons
i) Support the development of action plans

Step 1. Identify public health priorities

While it is necessary to expand the scope of surveillance to all hazards, it is important to still develop a priority list of diseases and conditions of public health importance for surveillance. Prioritizing a disease and condition of public health importance doesn't necessarily mean that those that don't make to the list will not be considered but only identifies health problems/issues that need to be dealt with promptly and not later. Additionally, resources including human, time, and money are limited hence should be expended in a way that the results are most impactful. The prioritization considers the magnitude, seriousness, and availability of public health intervention of the health problem. It also considers the social/economic impact of the intervention, political

goodwill to implement the intervention, availability of resources, and the global/regional/national interests in the intervention. Once a priority public health list for surveillance is developed, the conditions to be dealt with are decided based on the resource availability. Identification of public health priorities will be done by the national level MOH, however, the county level CDPH may also identify additional local level public health priorities.

Step 2. Define the EBS signals for events

Literally, all diseases and conditions of public health importance are preceded by events. After defining a list of priority diseases and conditions of interest, their events and signals that detect them are defined. An event is an occurrence that present an acute risk to human health while signals are statements on observations that are used to detect the events. Signals should be broad, simple, and non-disease specific statements as users are both technical and non-technical; and needs to detect an array of both known and emerging diseases and conditions. Signals may also include a disease-specific statement where a certain public health priority are targeted for global or national emphasis. Currently, the MOH has pre-defined six (6) CEBS signals, three (3) HEBS signals, and two (2) VEBS signals for routine EBS (**Annex 1C).** All the three sets of signals are used for PEBS and MEBS. When there is a need to enhance EBS e.g., during an outbreak, a working signal can be defined and incorporated into the lists for use during the life of the outbreak.

Lists of pre-defined signals for routine community, health facility, and veterinary event-based surveillance in Kenya, 2022

Community EBS signals	Health facility EBS signals	Veterinary facility EBS
1. Two or more people presenting with similar signs and symptoms in a community within a week 2. Any death in the community 3. Any child under 15 years with sudden weakness of the legs or arms 4. Increase in number of people older than 5 years with lots of watery diarrhea 5. Increased sickness including abortions and/or deaths of animals (wild or domestic and poultry/ birds or fish) 6. Any event that causes public health anxiety/concern	1. Two or more cases with similar symptoms and signs from the same community, social grouping, or function that required hospitalization within a week 2. Any healthcare worker who develops signs and symptoms during/after caring for a patient with similar illness 3. An increase in the number of patients (outpatients and inpatients); laboratory requests; prescriptions; etc. at the health facility	1. A cluster of animals with similar clinical signs from the same herd (farm, ranch, watering/feeding area, market, village/estate, etc.) that require treatment within a week 2. Any animal health care worker/ handler who develops an illness suspected to have been contracted from a sick animal

Step 3. Map and advocate for resources for EBS

To ensure sustainability, the day-to-day operations of EBS rides on existing routine surveillance and other health structures including human and other resources, community health systems, animal health systems, health facility networks, PHEOC facilities, call centers, emergency notification systems, etc. It is therefore of paramount importance that these structures consider this aspect during appropriation of resources. This avoids duplication of structures that lead to resource wastage. It is also important to note that since EBS is a relatively concept, the initial rollout is

resource intensive as it requires training of the entire workforce; setting up event reporting systems; development and production of resource materials; etc. When intending to establish an EBS system, it is important to map the resources that will be needed and mobilize for adequate funding to support the initial rollout and support operations.

Step 4. Define the functions and processes of EBS

The process of EBS takes place in six steps irrespective of the type, that is: signal detection, signal reporting, signal triaging, signals verification, event risk assessment, and public health action. While these are standard steps, they are undertaken at different levels depending on the type of EBS which determines the flow of information as well. Further, the roles and responsibilities also vary for the same workforce depending on the type of EBS. It is therefore important to identify the levels of the process; map out the workforce; define their roles and responsibilities; and define the flow of information for each type of EBS intended for establishment.

Setting up a community event-based surveillance system

A community EBS (CEBS) is the detection and reporting of events that may present a risk to public health within a community by the community members. A community is a residential, social, religious, occupational, or other group of people sharing common characteristics or interests and perceiving itself as distinct in some respect from the larger society within which it exists. A member of the community is any person residing/belonging to the community under surveillance. It is represented by basic village level service providers such as community health volunteers (CHV), community animal disease reporters (CDRs), community health assistants (CHAs), and animal health assistants (AHAs). Most events that present acute risk to public health occur within a community, thus, undertaking CEBS greatly improves timeliness in detection and reporting. To be sustainable and function well, CEBS should be integrated into the routine surveillance and health service systems.

Process of community event-based surveillance system

The process of Community Event-Based Surveillance is undertaken in the six (6) EBS steps of signal detection, signal reporting, signal triage, signal verification, event risk assessment and public health action (response). It utilizes the predefined community signals **(Annex 1C**). The CEBS draws information primarily from the community level networks including community members, key informants, leaders, village elders, nyumba kumi leaders, CBOs, drug stores, agro-vets, learning institutions, FBOs, CHVs, CDRs, etc. These networks are sensitized on the pre-defined community signals whereupon observing, witnessing, or being informed, they report to their respective CHV/CDR in person or through any other available means. To enable the networks report, the contacts (physical/phone) of the CHV/CDR should be published among the community members and the networks.

The CEBS primarily takes place at the community and sub county levels of the health system. The county and national levels provide a supportive role as and when needed e.g., events with very severe consequences, events with very high risks, and in cases of inadequate technical capacity and resources. The community level also provides additional information needed e.g., in verification, risk assessment and response. The CHVs and CDRs are responsible for sensitizing the community networks on signals to facilitate detection. The CHVs/CDRs can utilize household visits, barazas, dialogue days etc. to sensitize the networks. Traditional communication channels

such as banners, fliers, posters, etc. can also be used for sensitization. Upon detecting a signal, the CHVs and CDRs should relay the information to their respective CHAs/AHAs immediately. The CHAs/AHAs should then immediately triage and verify the signals and those verified true (events) reported to the Sub County for risk assessment and public health action.

Setting up a health facility event-based surveillance system

A health facility EBS (HEBS) is an organized and rapid collection of information of events which could constitute potential risk to public health within the health facilities.

The health facilities have traditionally been implementing indicator-based surveillance (IBS) which tracks priority diseases and conditions. This not only puts the frontline healthcare workers at the highest risk of contracting these conditions but also puts them at an advantage to promptly detect events presenting acute public health risk to them and the population at large.

The HEBS can promptly detect emerging and re-emerging conditions and aids in protecting the healthcare workers. HEBS draws information primarily from the healthcare workers including clinicians, nurses, infection control officers, laboratory scientists, specialists, health information officers, in-patient in-charges, out-patient in-charges, etc. HEBS should be integrated into the routine IDSR structure

Process of health facility event-based surveillance system

The process of HEBS is undertaken following the six (6) EBS steps, that is: signal detection, signal reporting, signal triage, signal verification, event risk assessment and public health action (response). It utilizes the predefined health facility signals (**Annex 1C).** The HEBS is part and parcel of the health service delivery activities at the health facility and has been designed as such. As patients visit the health facilities for services, they are handled by different sections and specialties for different services. These include the support staff, registration team, triage team, clinical team, diagnostic team, nursing team, inpatient team, health records, information team and others who have a crucial HEBS role to play and must be brought on board. All these team members should be sensitized on the signals which they detect in the course of their normal duties and report to their EBS focal persons (HFSFPs).

To detect the HEBS signals, the health workers make contact with the patient, caretakers, or family members as applicable and gather clinical symptoms, person, place and time information of the presenting condition. They then conduct physical examination and request laboratory investigations if applicable. The information gathered from history, clinical examination, record summaries, tracking volumes of prescriptions, laboratory investigation requests etc. is then matched with the predefined list of signals. Where there is a positive match then a signal is considered detected. All health facilities engaged in HEBS should have a Health Facility Surveillance Focal Point (HFSFP) who receives all the signals reported by the HCWs, triages, verifies them, and submits the events to the Sub County for risk assessment and public health action.

Setting up a veterinary facility event-based surveillance system

A veterinary facility EBS (VEBS) is a variant of the HEBS that takes place at facilities providing

animal healthcare services. It is the detection and reporting of events that are likely to present threats to public health at the animal health facilities. Frontline animal health experts including veterinarians, animal health assistants, agro-vet outlet managers, etc., due to their close interactions with animals, are likely to detect zoonotic events in animals before spill over into human health. They can also detect zoonotic events amongst them and their contacts before widespread. The veterinary facilities routinely implemented indicator-based surveillance (IBS) through the Kenya Animal Bio-surveillance Systems (KABS) which is a syndromic surveillance system tracking priority animal diseases and conditions. The VEBS complements the KABS by expanding the scope of diseases and conditions under surveillance; improves promptness in notifications; and tracking possible zoonotic spillovers.

Process of veterinary facility event-based surveillance system

The process of VEBS is undertaken following the six (6) EBS steps, that is: signal detection, signal reporting, signal triage, signal verification, event risk assessment and public health action (response). It utilizes the predefined veterinary facility signals (**Annex 1C).** Animal healthcare workers including veterinarians, animal health assistants, veterinary laboratory scientists, animal handlers, agrovet outlet managers, etc. are responsible for detecting and immediately reporting the VEBS signals

To detect the signals, animal health workers make contact with the farmer or animal owner either at the farm or any animal health facility such as veterinary clinics, agrovets, and gather information on clinical symptoms, person, place and time information of the presenting condition, conduct physical examination, run laboratory investigations, etc. They also review the etiology of ailments for self and contacts. If the information from these processes matches a VEBS pre-defined signal is considered a detected signal. The animal health experts immediately report all the detected signals to the AHAs/CHAs who then triages and verifies them before reporting those verified true (events) to the Sub County for risk assessments and response.

Setting up a hotline/phone event-based surveillance system

A hotline, also referred to as an emergency line, is a dedicated telephone line/number that the public can use to contact an institution or a health facility about a public health concern. Hotlines should be short and simple and if possible customized coded digits (e.g., 719) or easily memorable regular digits (e.g., 0720000000). A hotline can be used for Short Messaging Service (SMS), Interactive Voice Response (IVR), Unstructured Supplementary Service Delivery (USSD), voice call and social media (WhatsApp, Facebook, Telegram, Snapchat, Twitter, etc.) communications. Hotlines can be set up with direct billing of the callers or centrally paid for to grant callers a toll-free access.

Setting up a hotline/phone event-based surveillance (PEBS) system require a call center manned by a dedicated staff or an auto-attendant software which then directs the enquiries to where they can be acted on. For smaller institutions or health facilities, a staff can be assigned the responsibilities of handling the hotline. A PEBS call center is a set up that handles inbound/outbound hotline communications between the public and health personnel on matters that represent a threat to public health. Whereas a call center primarily receives information through telephone communications, community members should be allowed to make reports in person if convenient and doesn’t burden the system.

A call center requires:

a) An office space that should be set up away from noise and disturbance.
b) Equipment including telephone/mobile phone handsets, computers, reporting tools, and furniture, Call center software, redundant power supply and Internet connectivity.
c) Human resource equipped with communication skills, customer care skills, teamwork, telephone etiquette, questioning skills, transcription skills, etc.
d) Contact directories with emergency telephone numbers, physical addresses, email addresses, social media handles, etc.

The hotline EBS can be set up at the National, County, Sub County, health facility and community levels. Important considerations should be made when setting up a hotline EBS such as resources, personnel, time to respond, etc. When set higher up, the information gets to the top fairly fast, however, this is associated with high volume of calls and many steps in the follow up communication which may cause delays in response. Conversely, setting the Hotline EBS at a lower level is characterized by the rapid response time due to low volume of calls and fewer follow up steps. The public health authorities responsible for setting up PEBS must consider a balance of the level guided by optimization of available resources. For sustainability, the PEBS system rides on existing structures and facilities such as the PHEOC infrastructures, office telephone lines, and health facility emergency lines where present.

Process of hotline/phone event-based surveillance system

The PEBS system utilizes all the predefined signals (**Annex 1C**). Once a call is received at the call center, the receiver compares the information with the predefined signals and if the information matches any of the signals, then it is considered detected. Once detected, the call center staff triages the signal then relays the information to the CHA or AHA or HFSFP in whose jurisdiction the signal has been detected through the respective county, sub county, and ward depending on the level of the call center to undertake verification. If the signal is verified as a true (event), the CHA/AHA/HFSFP submits the information to the Sub County for risk assessment and response if needed.

Setting up a media scanning event-based surveillance system

Media scanning is the process of searching for information that may represent a public health threat from both print and electronic mass media platforms. The sources are very diverse and include both official and unofficial ones such as radios, televisions, newspapers, journals, websites, bulletins, social media, etc. The MEBS is modelled around the concept of internet bio-surveillance which utilizes unstructured data from diverse web-based sources to provide early warning and situational awareness of human, animal, and plant infectious diseases, as well as chemical, radiological and nuclear threats. Internet bio-surveillance emerged in the mid-1990s, relying primarily on text media for its information, then included social media, and other non-text-based sources. The material collected usually consists of any media output that may represent a public health event of interest.

Information for media scanning can be obtained from official sources that are reliable and do not need further verification such as websites of governmental sectors, websites for official organizations such as universities and international recognized centers of research, WHO official websites, etc. Information can also be obtained from unofficial media sources that are not reliable and need to be verified such as newspapers and magazines; TV and radio channels; social media e.g., Twitter, Facebook, WhatsApp, Instagram, Telegram, etc.; and internet bio-surveillance systems include Program for Monitoring Emerging Diseases (ProMED), Health Map, Medical Information System (MedISys), and Global Public Health Intelligence Network (GPHIN).

Advancement of information technology has led to widespread ownership of smartphones, print media access, television viewership, radio listenership makes media scanning event-based surveillance (MEBS) possible at any level.

The MEBS can be done offline and online with the later utilizing both manual and automated systems. Offline MEBS involves watching and listening to television and radio channels; and reading print media products. Online MEBS involves searching online media platforms for information on public health threats. Online searches can be manual where key words are used on search engines (google, chrome, etc.) to look for information.

Online searches can use automated technological tools that scans and sends notifications when any information containing the key words or phrases is published online. Examples of automated tools include Rich Site Summary (RSS feeds); contributor-based sources e.g., ProMed; data aggregators; etc. The multiplicity of sources of MEBS information including several television stations, radio channels, journals and newspapers, websites, social media applications, multiple blog networks, etc. require heavy human resource investments. This makes offline and online manual searching methods very expensive. Where possible, MEBS system should utilize automated search methods and ride on existing PHEOC and call center structures and resources.

Process of media scanning event-based surveillance system

The MEBS system can be set up at all the levels of service delivery and uses all the predefined signals (**Annex 1C**). Where Media Scanning EBS is done manually, a team of dedicated staff will be tasked with the responsibility of reading, listening, and viewing the diverse sources. Where electronic sources are available, broad keywords and phrases are developed around the "*what*", "*where*" and "*when*" for use in detecting information on events. Once information is identified from the media the team will get the details and match them with the predefined signals. If the information matches any of the signals, then it is considered detected. Once detected, if from a formal source, the information is submitted to the Sub County for risk assessment and response. If from an informal source, the information is relayed to the CHA or AHA or HFSFP in whose jurisdiction the signal has been detected through the respective county, sub county, and ward depending on the level of MEBS to undertake triage and verification. If the signal is verified as a true (event), the CHA/AHA/HFSFP submits the information to the Sub County for risk assessment and response if needed.

Step 5. Develop a data recording and reporting system

Data generation and management is an essential component for functioning and monitoring of

implementation of EBS activities. This will include data capture using appropriate tools, analyzes, use for real time decision making, and timely dissemination to relevant stakeholders. Data recording is the entry of details of the EBS processes into the data bases using designated data tools. Data recording is important for reporting purposes and facilitates follow up during triage, verification, risk assessment, response, and analysis. Data capture is the responsibility of all actors all steps in the EBS process. The databases can be hard copy permanent registers and logbooks or electronic hosted in the data servers. The electronic databases can be merged automatically making use easier, while the hard copy databases are held at respective level and require updating manually. There are data capturing tools at all the steps of EBS which can either be used as hard copy tools or digitized into electronic formats).

Where data is captured using hard copy logbooks, the CHVs/CDRs/HCWs would populate their notebooks and then report to the CHAs/AHAs/HFSFPs through the signal reporting tool. The CHAs/AHAs/HFSFPs then undertake triage and risk assessments, populate their logbooks, and report to the Sub County using the event verification tool. The SCDSC/SCVO then undertake risk assessment, populate their logbooks, and report through the event risk assessment reporting tool. Upon receipt of the risk assessment recommendations, the SCMOH/SCVO would lead the public health actions, populate their logbooks, and report through the public health action reporting tool. In necessary, the SCMOH/SCVO will escalate public health response to the county and national levels using the public health response escalation tool. In digitized formats, the logbook is maintained in the servers and the tools are in electronic forms that auto-populates and updates the logbook every time a report is submitted. Currently, the EBS system uses an electronic data capture and reporting platform christened m-Dharura. The m-Dharura is an open source web-based system that supports EBS data management in the collection, collation, analyzes, visualization, and dissemination of EBS information. All users depending on level shall be assigned access rights to enable data entry, viewing and use of data in the monitoring of performance.

Step 6. Develop a monitoring plan

The implementation of EBS monitoring plan describes why and how changes towards a desired public health surveillance goal can be realized. Monitoring is the process of continuously tracking progress or delays in the implementation the EBS processes including the respective outputs and outcomes. Monitoring help keep a tab on the implementation, timeliness, improvements, quality, challenges, and accountability of EBS implementation and provides a basis for re-adjustments based on performances to achieve the set targets. The monitoring system will use indicators which are measurable variables that provide information on status of the EBS program to enable managers to track progress, demonstrate results, and take corrective actions where necessary to improve on the inputs, activities, outputs, outcomes, and impacts.

The indicators provide information on status of the EBS program to enable managers to track progress, demonstrate results, and take corrective actions where necessary to improve on the inputs, activities, outputs, outcomes, and impacts. There are therefore different types of indicators based on the steps of the EBS program, that is, process indicators - inputs and activities; performance indicators - outputs, outcomes, and impacts; and quality indicators – EBS attributes (timeliness, completeness, accuracy, usefulness, simplicity, acceptability, flexibility, sensitivity, specificity, positive predictive value, and representativeness). Setting up of the indicators also vary

depending on the level and step of the EBS program. The m-Dharura system has both in-app and web-based dashboards that automates analysis and visualizations based on these indicators.

The data capture is coupled with prompt transmission of from one level to another through the designated methods including personal communication, SMS, telephone calls, hard copy reports, emails, applications, etc. with the recommended timelines. Detected signals should be reported immediately (within 8 hours of detection); triage and verification reports should be reported immediately (within 8 hours of signal receipt); events should be reported immediately (within 8 hours of signal receipt); risk assessments should be initiated and reported within 48 hours of signal report. The response activities are undertaken and reported continuously based on the recommendations of the risk assessment reports. Every data flowing from the lower to upper levels must be accompanied by a downward feedback flow. Prompt and regular feedback on reports is imperative to sustain motivation to report among those generating the reports.

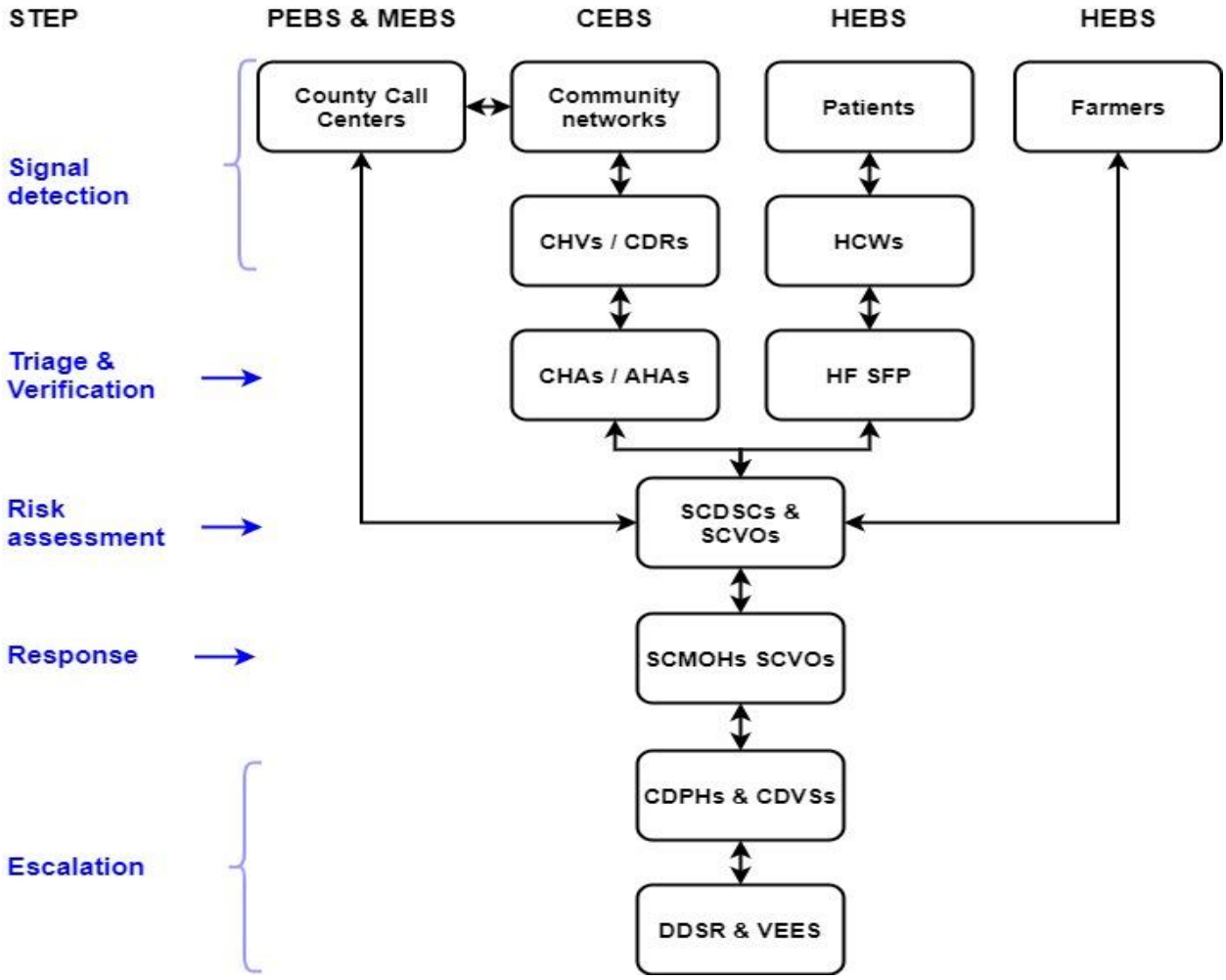


Figure 10: *Steps in Development of a monitoring plan*

Step 7. Set up an EBS coordination mechanism

The implementation of EBS utilizes a multisectoral approach (MSA). The MSA is a deliberate collaboration among various stakeholder groups (e.g., government, partners, civil society, community, private sector, etc.) and sectors (e.g., health, animal, and environmental health) to jointly achieve a policy outcome (in this case: to complete and improve EBS). The MSA is important in making EBS more efficient; synergizing efforts and maximizes outcomes; reducing challenges; aiding resource mobilization and pooling; helping complete the information with additional sources; and includes all involved sectors in EBS.

The public health authorities in all sectors at all levels responsible for setting up an EBS system must constitute an EBS MSA team. The constitution of a MSA team takes place in three main steps:

a) Identification of the team members – those that are affected by or may affect the CEBS system. They should be mapped and listed.
b) Prioritizing the stakeholders – Assess their level of interest, influence, and participation in CEBS. Can use the Interests-Power matrix
c) Understand the stakeholders – Build a profile for each stakeholder so as to strategically engage them. That is - identify their interests, align CEBS with their interests, and change negative views of the CEBS system

The MSA stakeholders should effectively be engaged in EBS implementation activities through joint planning, joint implementation, joint monitoring and evaluation, and effective communication and feedback.

Step 8. Build capacities of EBS implementers

The initial step in rolling out any EBS system is to build the capacities of those who will be playing primary roles in the implementation process. This step empowers the implementers with knowledge and skills concerning their roles in the processes of EBS. The training of the implementers of EBS is designed in a cascaded approach in line with the structure of the healthcare system. This process begins with the training of a national pool of trainers (TOTs) drawn from the public health, animal health, and environmental health sectors. The national TOTs then train the sub national (county and sub county) level TOTs who then train the community, health facility, veterinary facility, and call centers EBS focal persons. The focal persons are responsible for the continuous sensitization of those responsible for detection and reporting of the signals. The arrangements of these training materials are done in technical modules for various EBS types to facilitate type-by-type implementation at any level or region of interest. The EBS training methodologies include a mix of facilitations and mentorships.

Step 9. Support the development of action plans

Once the above steps have been accomplished, those responsible for the implementation must put in place a mechanism for supporting the implementation process. These include the development of action plans by the implementers; supportive supervision plans; and mobilization of resources required for implementation. The implementers must be made to clearly understand their roles and responsibilities and develop clear action plans to accomplish them. Plans for follow up supportive supervision of EBS implementation after the rollout should be drawn to provide guidance and mentorship to the implementers. To facilitate the implementation of EBS, the implementers must

be assisted to map and mobilize the necessary resources from the existing systems on to which EBS will ride; direct government appropriation; and partners.

Annex 1D: EBS reporting tools

Signal reporting tool

County_____ Sub County_____ CHU/HF_____ Reporter_____

1. Signal unique identifier
2. Date of signal detection
3. Signal details (Narrative/Code)
4. Date of signal report

Signal triage and verification tool

County_____ Sub County_____ CHU/HF_____ CHA/AHA/SFP/Vet_____

1. Signal unique identifier
2. Source of signal report
    a. Community
    b. Health facility
    c. Veterinary facility
    d. Hotlines
    e. Media scanning
3. Provide brief description of signal (What happened/Is happening?)
4. Does the information match one of the signals on the list?
    a. Yes (Continue to Qn. 5)
    b. No (STOP and submit)
5. If yes, what was the final classification of the public health signal? (pick from drop down)
6. Has this signal been reported before (Is it a duplicate report)?
    a. Yes (STOP and submit)
    b. No (continue to Qn. 7)
7. When did the signal start? (Date and time)
8. From whom was the information received? (Select one)

a. Self

b. Patient

c. Health care worker

d. Animal health care provider

e. Community health volunteer

f. Community animal disease reporter

g. Community member / leader

h. Community networks (religious organizations, learning institutions, markets, healers etc.)

i. Media (electronic, print, social)

j. Other (specify)

9. Does the reported signal still exist?

    a. Yes (verified True) (Continue to Qn. 10)

    b. No (verified False) (STOP and submit)

10. Please, provide any additional information about the event.

11. Does the event present a public health threat to? (Select one)

    a. Human only (Report to SCDSC)

    b. Animal only (Report to SCVO)

    c. Humans and animals (Report to SCDSC & SCVO)

12. Date when event was verified (Date and time)

13. Date when SCDSC/SCVO was informed about the event (Date and time)

Event initial risk assessment tool

County_____ Sub County_____ Reporter_____

1. Signal unique identifier _____

2. When was the SCDSC/SCVO informed? (Date and time)

3. When did the initial risk assessment begin/start? (Date and time)

4. When did the event start? (Date and time)

5. Provide a brief description of the event e.g., signs, symptoms, occurrences, etc.
6. Number of people presenting with signs and symptoms (Validation checks)
7. Number of human cases hospitalized (Validation checks)
8. Number of human deaths (Validation checks)
9. Number of animals with signs and symptoms
10. Number of animals dead (Validation checks)
11. Is the cause of the event known?
    a. Yes (Continue to Qn. 12)
    b. No (Continue to Qn. 13)
12. What is the cause? _____
13. Have the laboratory samples been taken?
    a. Yes (Continue to Qn. 14)
    b. No (Continue to Qn. 19)
    c. N/A (Continue to Qn. 19)
14. Date of sample collection (Date and time)
15. What are the laboratory results? _____
16. Date when the results were received (Date and time)
17. Are new cases still being reported from the initial area
    a. Yes
    b. No
18. Are new cases still being reported from new areas
    a. Yes
    b. No
19. Does the event setting promote transmission?
    a. Yes
    b. No

c. Don’t know

20. Please provide additional information _____

21. How do you classify the risk of the event?

    a. Low

    b. Moderate

    c. High

    d. Very high

22. What are the recommended response activities? (allow multiple responses)

    a. Further investigation

    b. Monitor event

    c. Strengthen surveillance

    d. Strengthen routine services

    e. Event specific prevention and control measures

23. Date report submitted to the SCMOH (date and time)

Public health response tool

1. Signal unique identifier
2. Type of the event (disease, condition, hazard)
3. Date when the SCMOH was informed (date and time)
4. Date when public health response started (date and time)
5. What public health responses were undertaken? (allow multiple selection)

    a. None

    b. Close monitoring

    c. Strengthened surveillance

    d. Further investigation

    e. Prevention and control measures

    f. Risk communication and community engagement

g. Case management

h. Others (specify)

6. What is the outcome of the public health response(s)?

    a. Event resolved (skip to Qn. 9)

    b. Response on going (continue to Qn. 7)

7. Recommendations for the public health response(s)

    a. Maintain response(s) (skip to Qn. 9)

    b. Escalated to higher level (continue to Qn. 8)

8. Date of escalation of public health response(s) (date and time)

9. Date of public health response(s) report (date and time)

10. Additional information on the response(s) activities _____

Escalation reporting tool

1. Signal unique identifier

2. Type of the event _____ (disease, condition, hazard)

3. Date of response (date and time)

4. Reason for escalation

    a. Information

    b. Technical support

    c. Resource support

    d. Other (specify)

5. Date of escalation (date and time)

Annex 1E: EBS logbook

Signal detection and reporting					Signal triage and verification							Risk assessment							Public health action					Remarks
S/No.	Date of detection	Signal code	Date reported	CHV/CDR/HCW initials	Date signal received	Date triaged	Final signal code	Date verified	Verification outcome	Date event reported	CHA/AHA/HFSFP initials	Date event received	Date risk assessment started	Date risk assessment closed	Risk status	Recommended public health action	Date risk assessment report [illegible]	SCDSC/SCVO initials	Date RA report received by the Sub County PRT	Date public health action initiated	Date public health action concluded	Event status	SCMOH/SCVO initials	
1																								
2																								
3																								
4																								
5																								

Annex 1F: EBS Monitoring Framework

Results area	Activity	Indicator	Baseline	Annual targets	Results				Indicator definition		Data source	Data collection frequency	Responsible person
					Q1	Q2	Q3	Q4	Numerator	Denominator			
Inputs	Adaptation or development of EBS guidelines	Availability of EBS technical guidelines									Preparedness checklist	Once	
	Adaptation or development of EBS reporting tools and systems	Availability of reporting tools									Preparedness checklist	Once	
	Adaptation / development of EBS training materials	Availability of EBS training materials									Preparedness checklist	Once	
	Budgetary allocations / resource mobilization for EBS implementation	Budgetary provisions for EBS activities									Preparedness checklist	Annually	
	Identification of staff to implement EBS	No. and profiles of staff for EBS implementation established									Preparedness checklist	Annually	
	Detailed mapping of community networks for EBS	No. of community networks mapped for EBS									Preparedness checklist	As needed	
	Listing of health facilities for EBS implementation	No. of health facilities listed for EBS implementation									Preparedness checklist	As needed	

Results area	Activity	Indicator	Baseline	Annual targets	Results				Indicator definition		Data source	Data collection frequency	Responsible person
					Q 1	Q 2	Q 3	Q 4	Numerator	Denominator			
	Setting up of an EBS implementation stakeholders / TWG	EBS stakeholder's forum / TWG formed									Preparedness checklist	Once	
	EBS implementation plan	Availability of EBS annual work plan (AWP)									Preparedness checklist	Annually	
Activities	Procure and distribute EBS equipment, commodities, and supplies	Proportion of required equipment and supplies available for implementation							Procurements made	Procurements scheduled (AWD)	Activity reports	Quarterly	
	Hold planning meetings at all levels of implementation	Proportion of scheduled planning meetings held							No. of planning meetings held	No. of scheduled planning meetings	Activity reports	Quarterly	
	Conduct trainings of all implementers including community networks	Proportions of staff including community networks trained on EBS							No. of trainings done	No. of trainings scheduled (AWP)	Activity reports	Quarterly	
	Disburse funds to support the recurrent operations of EBS	Proportion of allocated funds for EBS disbursed for implementation							Amount of funds disbursed	Amount of funds allocated	Activity reports	Quarterly	
Outputs	Detection of EBS signals	No. of signals detected									Signal reporting tool	Monthly	
	Reporting of EBS signals	Proportion of signals reported							No. of signals reported	No. of signals detected	Signal triaging tool	Monthly	

Results area	Activity	Indicator	Baseline	Annual targets	Results				Indicator definition		Data source	Data collection frequency	Responsible person
					Q1	Q2	Q3	Q4	Numerator	Denominator			
	Triaging of EBS signals	Proportion of reported signals triaged							No. of signals triaged	No. of signals reported	Signal triaging tool	Monthly	
	Verification of EBS signals	Proportion of triaged signals verified							No. of events verified	No. of signals triaged	Signal verification tool	Monthly	
	Risk assessments for the EBS events	Proportion of events assessed for risks							No. of RAs undertaken	No. of events reported	Risk assessment tool	Monthly	
	Public health actions on EBS events	Proportion of events responded to							No. of PHAs undertaken	No. of PHA recommended based on RA	Public health action tool	Monthly	
	Regular support supervision of the EBS implementation	Proportion of scheduled support supervision done							No. of support supervisions held	No. of scheduled support supervisions (AWP)	Support supervision reports	Monthly	
	Routine EBS review meetings	Proportion of routine review meetings held							No. of review meetings held	No. of scheduled review meetings (AWP)	Meeting reports	Monthly	
	Routine EBS coordination meetings	Proportion of routine coordination meetings held							No. of coordination meetings held	No. of scheduled coordination meetings (AWP)	Meeting reports	Monthly	
Outcomes	Improve the promptness in detection of acute public health threats	Proportion of signals and events detected within 24 hours of onset							Signals detected <24 hours from onset	All signals detected	Signal detection tool	Monthly	
	Reduce the time taken to report detected acute public	Proportion of signals and events reported within 24							No. of signals reported within <24 hours upon	All signals reported	Signal triaging tool	Monthly	

Results area	Activity	Indicator	Baseline	Annual targets	Results				Indicator definition		Data source	Data collection frequency	Responsible person
					Q1	Q2	Q3	Q4	Numerator	Denominator			
	health threats	hours of detection							detection				
	Strengthen the public health actions to detect acute public health threats	Proportion of events responded to within 48 hours of detection							No. of events responded to within <48 hours after detection	All events that require PHA	Public health action tool	Monthly	

Annex 1G: EBS sensitization slides

Slide 1

Introduction to Event-based Surveillance (EBS) System

Facilitator

Division of Disease Surveillance and Response, Ministry of Health, Kenya

Slide 2

Outline

- Public health surveillance
- Indicator-based and event-based surveillance systems
- Importance of event-based surveillance
- Types of event-based surveillance
- Process of event-based surveillance

Division of Disease Surveillance and Response, Ministry of Health, Kenya

Slide 3

Public Health Surveillance

- Ongoing, systematic collection, analysis, and interpretation of health-related data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those responsible for prevention and control
  - World Health Organization
- Information for action!

Division of Disease Surveillance and Response, Ministry of Health, Kenya

Slide 4

Public health surveillance in Kenya

- MOH conducts public health surveillance (PHS) using the Integrated Disease Surveillance and Response (IDSR) strategy
- MOALF conducts public health surveillance using the Kenya Animal Bio-surveillance System (KABS)
- Utilizes information from two complimentary sources:
  - Indicator-based surveillance (IBS)
  - Event-based surveillance (EBS)
- Takes into consideration a one health approach

Division of Disease Surveillance and Response, Ministry of Health, Kenya

Slide 5

Integrated Disease Surveillance and Response (IDSR) Strategy

- Indicator (disease/conditions) based surveillance (IBS) system
- Integrates surveillance activities under one focal point at all levels
- Tracks a list of priority diseases and conditions
- Uses standard/lay case definitions for detection
- Undertakes routine notifications – immediately, weekly, monthly
- Links surveillance to action/response

Division of Disease Surveillance and Response, Ministry of Health, Kenya

Slide 6

Kenya Animal Bio-surveillance System (KABS)

- Disease surveillance system in both domestic and wild animals capable of near real time data collection, transmission, analysis, and feedback
- Utilizes a mobile phone application that allows public and private animal health practitioners to capture data on animal health using a standardized surveillance tool and transmit to the server
- Has the capabilities of analyzing submitted data and provide immediate automated feedback to the field officers

Division of Disease Surveillance and Response, Ministry of Health, Kenya

Slide 7

Indicator based surveillance (IBS)

- Traditional method of tracking and reporting diseases and conditions of public health importance to public health officials
- Involves reports of specific (priority) diseases/conditions **mainly** from health care providers
- The information is structured, obtained using standard case definitions, and periodic
- **Main feature of IDSR and KABS strategies**

Division of Disease Surveillance and Response, Ministry of Health, Kenya

Slide 8

Event Based Surveillance (EBS)

- A surveillance method of tracking and reporting on occurrences/observations (events) that present threats (acute risks) to public health
- Involves medical, veterinary, environmental, and natural occurrences detected through multiple sources
- Information is unstructured and ad hoc
- **Compliments IBS (IDSR & KABS)**

Division of Disease Surveillance and Response, Ministry of Health, Kenya

Slide 9

IBS vs EBS

IBS	EBS
Tracks a list of **priority** diseases and conditions	Tracks **all events** that present risks to public health
Information obtained mainly from health service providers – often **official**	Information obtained from all sources – **official** and **unofficial**
Uses **disease specific** standard case definitions to detect priority diseases	Uses **non-disease specific** signals to detect public health threats
Undertakes **periodic** reporting – immediately, weekly, monthly	Reports sone in **real-time**

Division of Disease Surveillance and Response, Ministry of Health, Kenya

Slide 10

Why EBS is important?

- IBS and EBS are integral components of public health surveillance
- EBS compliments IBS by:
  - **Strengthening early warning and response (EWAR) mechanisms**: Since most disease outbreaks are preceded by events, EBS provides a lead time for putting measures in place to prevent or reduce adverse outcomes of the outbreak
  - **Improving reporting rates**: Due to multiplicity of sources, the proportion of diseases/conditions reported are much higher than utilizing health facility (IBS) reports only
  - **Expanding scope to all hazards**: Uses signals which are non disease specific hence can detect both endemic/emerging and known/unknown diseases and conditions

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Types (sources) of EBS

- **Community (CEBS)**
  - At the community (including LEBS)
- **Health facility (HEBS)**
  - At the health facilities (including VEBS)
- **Hotlines / Phone (PEBS)**
  - Dedicated lines for reporting
- **Media scanning (MEBS)**
  - Print and electronic including social media

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Community EBS (CEBS)

- CEBS is detection and reporting of events that are likely to present threats to public health within a community by community members and networks
- Public health threats are most likely to be detected by CHVs, CDRs, CHAs, AHAs, and community networks (leaders, community members, shop keepers, FBOs, NGOs, learning institutions, administrators, healers, drug stores, etc.)
- CHVs, CDRs, CHAs, and AHAs can improve detection from their communities by sensitizing the community networks

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Health facility EBS (HEBS)

- HEBS is detection and reporting of events that are likely to present threats to public health at health facilities by the healthcare workers
- Public health threats at the health facilities can be picked by frontline healthcare workers such as clinicians, nurses, laboratory scientists, pharmacists, health records and information officers, support staff, etc.

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Veterinary facility EBS (VEBS)

- VEBS is detection and reporting of events that are likely to present threats to public health at the animal health facilities
- Frontline animal health experts including veterinarians, animal health assistants, agro-vet outlet managers, etc., due to their close interactions with animals, are likely to detect zoonotic events in animals before spillover into human populations
- They can also detect zoonotic events amongst themselves and their contacts before widespread

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Phone/Hotlines EBS (PEBS)

- A hotline is a dedicated telephone line that the general public can use to contact an institution/organization about a particular concern
- Can be used for calls, texts/SMS, or social media messaging



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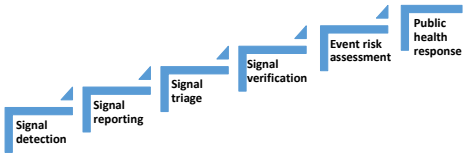
Media scanning EBS (MEBS)

- Searches for unstructured data from diverse media sources to provide early warning of threats to public health such as electronic, print, web, social media and other sources
- Searching can be manual e.g., listening to the radio, reading newspaper, looking through web-based platforms or social media
- Searching can also be automated e.g., by key words or phrase; search applications with alerts

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Process (steps) of EBS



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What is a signal?



SIGNAL = a report on SMOKE coming from a building

The smoke could be the building is on fire, somebody is cooking, somebody is heating the house, somebody is smoking shisha, etc.

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Signals in EBS

- A signal is a set of observations used in EBS as an indicator of a **possible** event (public health threat)
- Signals are pre-defined by a public health authority (MOH) based on the public health priorities
- A signal is the equivalent to a standard/lay case definitions used in indicator-based surveillance (IBS)
- However, signals are **broader, simpler** and **not disease specific**. Designed to detect known and unknown phenomena including emerging and re-emerging diseases

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Case definitions vs signals (measles example)

SCD	LCD	Signal
• ***Suspected case***: Any person with fever and maculopapular (non-vesicular) generalized rash and any one of the following: cough, coryza or conjunctivitis (red eyes) or any person in whom a clinician suspects measles • ***Confirmed case***: A suspected case with laboratory confirmation or with epidemiological linkage to confirmed cases in an outbreak	• Any person with hotness of the body and a rash	• Two or more people with similar symptoms

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Pre-defined CEBS signals

1. Two or more people presenting with similar symptoms in a community within a week
2. Any death in the community
3. Any child under 15 years with sudden weakness of the legs or arms
4. Increase in number of people older than 5 years with lots of watery diarrhea
5. Increased sickness including abortions and/or deaths of animals (wild or domestic and poultry/ birds or fish)
6. Any event that causes public health anxiety/concern

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Pre-defined HEBS signals

1. Two or more cases with similar symptoms and signs from the same community, social grouping, or function that required hospitalization within a week
2. Any healthcare worker who develops signs and symptoms during/after caring for a patient with similar illness
3. An increase in the number of patients (outpatients and inpatients); laboratory requests; prescriptions; etc. at the health facility

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Pre-defined VEBS signals

1. A cluster of animals with similar clinical signs from the same herd (farm, ranch, watering/feeding area, market, village/estate, etc.) that require treatment within a week
2. Any animal health care worker/ handler who develops an illness suspected to have been contracted from a sick animal

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Process of EBS – Signal detection

- Process of **recognizing** the presence of any of the pre-defined signals for public health events
- A signal is an observation that **MAY** represent a public health threat occurring in a population
- Current pre-defined signals
  - Community
  - Health facility
  - Veterinary facility

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Process of EBS – Signal reporting

- Process of communicating information on detected signals to public health officers at higher health service levels
- Reporting is a procedure at all the steps of EBS, however, emphasis is done in signal reporting being the initial step necessary for M&E. EBS does not have **zero** reporting
- Detected signals **MUST** be reported immediately (**real-time**)
- Reporting should be done through an agreed or any available means e.g., in-person, telephone call, SMS, email, social medial, digital applications, etc.

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Process of EBS – Signal triage

- Due to its high sensitivity, EBS is likely to generate signals for real and non-real events
- Signal triage is the process of sorting out (filtering) reported signals to identify which ones are mostly likely to be real events
- Guiding triage questions are:
  1. Does the reported information match any pre-defined EBS signal?
  2. Is the information relevant for EWAR? (Is it on-going?)
  3. Has the signal not been reported previously (Not a duplicate)?
- Any signal that gets a "YES" response to all the three questions is subjected to verification
- Triage information is obtained from the signal reporting entity

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Process of EBS – Signal verification

- Verification is confirming if a signal is authentic/valid (that is, true or false)
- Verification is done through:
  - Gathering additional information from where the reported signal is
  - Considering the credibility of the source of signal
- Any signal that is verified true becomes an **EVENT**
- All events should be notified to the next level

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What is an event?

- An event is an **occurrence** that presents a threat to public health
  - E.g. a confirmed cluster of health conditions with similar symptoms within a week
- A signal is verified true (confirmed) becomes an event
- **An event is a signal that is verified true**

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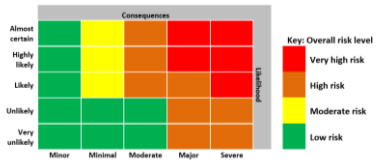
Process of EBS – Event risk assessment

- RA is the process of determining the level of risk of an event poses to public health and recommending the appropriate level response needed
- Involves gathering and evaluating available information to characterize the level of risk that the event poses to public health based on:
  - Likelihood of the exposure to the hazard
  - Consequence of exposure
- RA is subjective – based on personal perceptions
  - Tools such as risk characterization matrix can be used to guide decision making
- **RA links EBS to IBS**

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Risk characterization matrix



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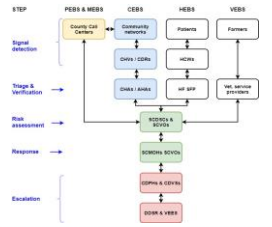
Process of EBS – Public health action

- Public health activities taken in response to an event based on the level of risk and RA recommendations e.g.:

Level of risk	Suggested response
Low risk	Managed according to standard/routine response protocols
Moderate risk	Specific monitoring or control measures are required: Enhanced surveillance, vaccination campaign, etc.
High risk	Attention of senior management needed; may need an incident management system; additional control measures to be put in place e.g., closure of livestock markets
Very high risk	Immediate action required at all times required; immediate senior management attention needed; additional control measures may include stringent actions e.g. lockdowns

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EBS of information flow



Reporting timelines

Report	Timelines	Responsible person
Signal information	Immediately	Networks / Farmers
Signal reporting	Immediately	CHV / CDR / CHA / AHA
Verification	8 hours	CHA / AHA
Risk assessment	24 hours	SCDSC / SCVO
Public health response	48 hours	SCMOH / SCVO
Event escalation	As needed	SCMOH / SCVO

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Summary

- Public health surveillance (PHS) is information for action
- IBS and EBS are sources of information for PHS
- EBS improves the sensitivity, timeliness and detection rate of PHS
- Types of EBS includes: community, health facilities, hotlines, and media scanning
- EBS involves signal detection, triage and verification; risk assessment and response/action
- Reporting and feedback must take place immediately at each step
- Kenya is implementing EBS as part of IDSR

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Annex 1H: List of Sub-County Reporting Sites

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

Below is an example of an inventory for reference

EXAMPLE: List of reporting sites in Loima Sub-County for the FY 2020/21

Name of health facility /reporting sites	**Location of facility/reporting sites**	**Designated focal person for surveillance and response**	**Telephone or email (or other contact information)**
Turkwel Health Center	*Village: Naipa Lorugum ward; Sub-County: Loima*	*Mr. Kugonza Fred.*	*Tel: 077-2 ****** or send email on xxxxx@gmail.com*

Annex 1I: Laboratory Functions by Health System Level

Laboratory functions by health system level			
Level	**Collect**	**Confirm**	**Report**
Health Facilities	Use standard case definitions to determine initiation of specimen collection process Assist Field Laboratory in specimen collection within approved guidelines Document specimens with clinical history Transport specimens to Field Laboratory and Referral Laboratory per approved guidelines including the laboratory reporting form	Use standard case definitions to initiate or request appropriate testing for disease confirmation Handle specimens using approved SOPs and guidelines	Record details of specimen collection and transport Receive test results and provide feedback
Sub-County	Communicate specimen collection policies and procedure to providers Request additional specimen collection materials as needed Store specimens per appropriate conditions pending transport or additional	Perform laboratory tests for presumptive diagnosis as appropriate and available Store representative samples for transportation in specified conditions as per guidelines 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 testing 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

	studies		

Laboratory functions by health system level			
Level	**Collect**	**Confirm**	**Report**
	Direct additional collection as needed based on outbreak investigation Arrange for specimen transport to Field Laboratory and Referral Laboratory per approved guidelines including the laboratory investigation and reporting form		Use summary information for outbreak investigation
National Referral Labs	Set specimen collection guidelines, policies and procedures with the national authorities Distribute appropriate specimen collection materials, triple packaging and transport media 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 testing Report results to Regional/Sub-county Health Teams and all relevant stakeholders at National and Regional/Sub-county 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 data and results so as to monitor changes in trends

Laboratory functions by health system level			
Level	**Collect**	**Confirm**	**Report**
Global / Collaborating 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 1J: Responsibilities of Laboratory Focal Persons at all Levels

National Level Laboratory Focal Person

(a) Coordinate all laboratory related activities in support of disease surveillance preparedness and response.
(b) Establish and support collaboration with epidemiologists/surveillance officers.
(c) Define laboratory testing capabilities in-country and those referred internationally and share this information with all stakeholders.
(d) Maintain an updated list of the laboratories performing required laboratory testing.
(e) Maintain an updated list of inventories of supplies, reagents and equipment from all the laboratories.
(f) Establish a memorandum of understanding (MOU) with international laboratories for provision of laboratory diagnosis or confirmation of priority diseases not yet available in the country and coordinate appropriately.
(g) Support the laboratory through advocacy with higher levels in accessing the necessary infrastructure, equipment and supplies to collect, handle, test, store, and ship specimens safely.
(h) Ensure that there is a sample transportation framework within the country and outside the country to facilitate sample transportation.
(i) Ensure that laboratory results are reported in a timely manner to all relevant stakeholders and used appropriately to inform public health action and patient clinical management.
(j) Ensure that there is a proper record for laboratory results.

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

Regional laboratory focal person

(a) Maintain an updated list of the laboratories that will perform required laboratory testing.
(b) Provide information to all health facilities for correct transport of specimens.
(c) Maintain an updated list of inventories of supplies, reagents and equipment from all the laboratories in the Region.
(d) Ensure that laboratory confirmation procedures established at the national level are known and followed in the county and sub counties.
(e) Ensure that specimen collection, transport materials and laboratory diagnostic tests are available to enable the timely detection of priority diseases.
(f) Coordinate with health facilities and laboratories in collecting, safely packaging and reliably transporting the appropriate specimen for confirming the suspected case.
(g) Receive results from the laboratory and promptly report them according to country procedures to all that require them for public health action and patient clinical care.
(h) Ensure that there is a proper record for laboratory results.
(i) Communicate with reference laboratory and National Laboratory Coordinators as necessary.
(j) Ensure that the laboratories have a quality assurance program to improve the reliability and reproducibility of laboratory results.

Sub-County Laboratory Focal Person

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

Facility Laboratory Focal Person

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

Annex 1K: List of National Laboratories for Confirming Priority Diseases and Conditions

Periodically update the list of laboratories in your sub county and those specified by the national level for confirming priority diseases and conditions. Include in the list whom to contact for assistance. Sub counties are expected to establish capacity for initial laboratory testing within their level 4 and 5 hospitals and other partner laboratories.

The following is a list of national referral laboratories for selected priority diseases:

Priority diseases, conditions and events	**Focal Person, Name of Lab, address, and phone number**
Anthrax	**For human samples** All county and Sub County laboratories Kenya Medical Research Institute Centre for Microbiology Research Microbiology laboratory Mbagathi road - Kenyatta National hospital ground Phone No.+254 (0) 02 2722541 National Public Health Labotatory ILRI **Animal samples** Department of Veterinary Services Veterinary laboratories – Kabete Phone 020 2608354
Chemical attacks/events	Government chemist Department National Government chemist Department Kenyatta Hospital Grounds P.O Box 20753-00200 Tel +254-020-2725806/7 Fax +254-020-2717567 Email gchemist@wnananchi.com
Cholera	All county and Sub County laboratories Level 4 and 5 Private laboratory National Public Health Laboratory Centre for Microbiology Microbiology laboratory Kenyatta national hospital-grounds Phone: Phone No.+254 (0) 022722541

Priority diseases, conditions and events	Focal Person, Name of Lab, address, and phone number
Dengue fever	National Public Health Laboratory Kenya Medical Research Institute Centre for viral research Arborviruses laboratory Mbagathi road - Near Kenyatta Market Phone No.+254 (0) 022722541
HIV	All County, sub county al hospital laboratories Kenya Medical Research Institute Centre for viral research HIV laboratory Mbagathi road - Near Kenyatta Market Phone No. Phone No.+254 (0) 022722541 National Public Health Laboratory HIV reference laboratory Kenyatta national hospital-grounds Phone : +254 (0) 02729549
Influenza	Kenya Medical Research Institute National Influenza research laboratory Kenyatta national Hospital grounds National public health laboratories Phone No.+254 (0) 022722541
Leishmaniasis	All sub county and provincial hospital laboratories. National Public Health Laboratories Division of Vector Borne and Neglected Diseases Leishmaniasis laboratory Kenyatta National hospital grounds Phone: +254202710518
Measles	KEMRI - Kenya Medical Research Institute Centre for viral research Measles laboratory Mbagathi road - Near Kenyatta Market Phone No.+254 (0) 02 2722541

Priority diseases, conditions and events	Focal Person, Name of Lab, address, and phone number
Plague	All sub county and provincial hospital laboratories. National Public Health Laboratories Regional Plague center Kenyatta National hospital grounds Phone:
Polio/AFP	Kenya Medical Research Institute Centre for viral research Polio laboratory Mbagathi road - Near Kenyatta Market Phone No.+254 (0) 022722541
Public health events of national or international concern	The Head, Division of Disease Surveillance and Response Ministry of Public Health and Sanitation Kenyatta National Hospital Grounds Phone No: Department of Environmental Health Ministry of Public Health and Sanitation Afya House Phone No: 0202717077 Kenya medical Research Institute Mbagathi road- Kenyatta Market Phone No.+254 (0) 022722541 Government Chemist Kenyatta National hospital –grounds Adjacent to National Public Health Laboratories
Radiological events	Radiation Protection Board Kenyatta National Hospital Grounds P.O. Box 19841-0202 Nairobi Tel: +254-020-2714558/4397 Fax: +254-020-2714383 Email: rpbkenya@nbnet.go.ke
Rift Valley Fever	Kenya Medical Research Institute Centre for viral research Arborviruses laboratory Mbagathi road - Near Kenyatta Market Phone No.+254 (0) 022722541

Priority diseases, conditions and events	Focal Person, Name of Lab, address, and phone number
Schistosomiasis	All sub county and provincial hospital laboratories. National Public Health Laboratories Division of vector Borne and Neglected Diseases Schistosomiasis laboratory Kenyatta National hospital grounds Phone: +254202710518
Tuberculosis	All sub county and provincial hospital laboratories National Public Health Laboratories Tuberculosis laboratory Kenyatta National hospital ground Phone: .+254 (0) 022722541
Typhoid fever	All sub county and provincial hospital laboratories National Public Health Laboratories Centre for microbiology Microbiology laboratory Kenyatta National hospital grounds Phone: +254202710518

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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES FOR KENYA

THIRD EDITION

SECTION 2: REPORT PRIORITY DISEASES, CONDITIONS AND EVENTS

May 2022

SECTION 2: REPORT PRIORITY DISEASES, CONDITIONS, AND EVENTS

2.1 Report priority diseases, conditions, and events

Integrated Disease Surveillance and Response (IDSR) is a system that ensures a continuous reporting of epidemiologic information to the national level in order to fulfill IHR (2005) requirements. Reliable reporting provides information for surveillance officers, Sub-County or County health authorities, epidemiologists, and competent authority at Point of Entry (PoE), program managers, the national IHR focal point, the WHO contact point and other health staff. This information helps to:

- Identify emerging problems or conditions
- Plan appropriate responses, including informing relevant staff or levels
- Take action in a timely way
- Monitor disease trends in the area
- 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 reporting follow different timelines for the following different purposes:

Immediate reporting of case-based information allows for 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 (MOH 505) Weekly aggregated reporting provides data for monitoring trends of diseases, conditions or events for early detect outbreaks.
Monthly/quarterly aggregated reporting provides data for monitoring the health status of the population and impact of disease specific programs, and for planning allocation of resources.

Note: National policy will determine reporting requirements and the public health events to be reported and whether data from the Sub-County and health facilities are to be reported immediately, weekly, monthly, or quarterly

Paper based tools and mobile phones are the most commonly used tools for reporting these diseases, events and conditions, which are then filled into the Kenya Health Information System (KHIS). While paper-based tools can provide timely information, we should aim to have electronic tools to facilitate rapid transmission of data to enable timely response to public health threats (eIDSR). However, Kenya is transitioning to using electronic tools to facilitate rapid transmission of data to enable timely response to public health threats. The potential benefits of using electronic reporting tools for eIDSR include: more timely reporting, investigation, and response to outbreaks. Electronic reporting may also improve data quality; enhance virtual, near real-time disease and events monitoring capability, leading to reduced system costs and easily generate automated alerts. In addition, information can be more easily stored and accessed (See Section 9 for electronic IDSR (eIDSR) System Guide for countries).

The targeted public health workforce for IDSR are primarily staff at all levels of the health system (both

human and animal), Information Technologists (IT) personnel, who will oversee the Information Communication Technology (ICT) aspect of the system at all levels, supervisory and disease specific program personnel at all levels i.e., Community, Sub-County, County and decision makers at national levels. Kenya aims to create systematic (make systems interoperable) linkages and information sharing platforms to strengthen eIDSR. This can be done by strengthening collaboration between Ministries of Health Units i.e., HMIS, IDSR, Maternal and Newborn (PDSR), National and County public health reference laboratories and laboratory networks, and relevant units in the Ministries responsible for Agriculture, Livestock, Wildlife and the Environment.

2.2 Immediate reportable diseases, conditions and events

Immediate reporting is indicated when an epidemic-prone disease or other potential Public Health Emergency of International Concern (PHEIC) is suspected or is otherwise required under the International Health Regulations (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 5 below. 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 (Sub-County where the PoE is situated) as well as simultaneously to the National IHR Focal Point (NFP). Reporting units with no diagnostic capacity, will use the suspected case definition to identify and report diseases, conditions and events. Additionally, information of contacts will be collected. Section 4 describes how to conduct contact tracing and also how to report contacts.

For conditions like maternal deaths, the circumstances leading to the death need to be gathered and analyzed and health providers should use the national Maternal Death Surveillance and Response (MDSR) in consultation with the Sub-County Disease Surveillance Co-coordinators.

Table 5:*Disease, conditions or events requiring immediate reporting*

Acute hemorrhagic fever syndrome (Ebola Virus Disease, Marburg, Lassa Fever, RVF, Crimean-Congo)	Middle East Respiratory Syndrome Coronavirus (MERS-CoV)
Acute jaundice	Neonatal tetanus
Adverse Events Following Immunization (AEFI)	Plague
Anthrax	Poliomyelitis (Acute Flaccid Paralysis) (AFP)
Bacterial meningitis	Rabies (Human)
Chikungunya	SARIs
Cholera	SARS e.g., COVID-19
Dengue fever	Smallpox
Diarrhea with blood (*Shigellosis*)	Typhoid fever
Dracunculiasis (Guinea Worm disease)	Yellow fever
Influenza due to new subtype	Zika virus disease
Maternal death	Any public health event of international concern (infectious, zoonotic, food borne, chemical, radio nuclear or due to an unknown condition)
Measles	

In IDSR, there are two types of thresholds used to initiate response:

a) an alert threshold and
b) an action 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 action thresholds. Thresholds for alerts and epidemic for epidemic prone diseases, conditions or events are shown in **Section 11**.
Please refer to **Section 11** for disease-specific information including surveillance case definitions, alert and action thresholds for reporting.

2.3 Reporting case-based information to the next level

If an immediately reportable disease, condition or other public health event is suspected, the health facility must report case-based information to the next level within 24 hours. Information obtained through

preliminary investigation of suspected case includes:

- Patient's geographical location
- Health facility or facilities that managed or handled the patient 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
- Sample and laboratory results (if available)
- History of travel
- History of contacts (Human or Animal)
- Any maternal death, once occurred, should also be reported immediately within 48 hours of occurrence.

Make the initial report by the fastest means possible (telephone, e-mail, text message, social media). The health facility should contact the Sub-County Health Management Team immediately and provide information about the patient or event.

Follow up the initial verbal report with a written report using a standardized case-based report form. 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 you protect the patient's privacy by encrypting patient ID data so only few health staff can access the detailed information, or you can also set up appropriate user rights such as creating a password for your use 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 investigation form, and the case-based reporting form all match, with proper packaging to ensure reliable results. Ensure also that a copy of the case-based form accompanies the laboratory request form and the specimen. A sample laboratory request form is included in **Annex 2G page 194**

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

Note: Some epidemic-prone diseases, conditions or events (maternal deaths) have specific reporting requirements depending on national or regional policies. Please refer to disease and conditions-specific requirements in Section 11 of this guide.

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

For all events, establish a line list of suspected cases or 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 a particular disease or event. The line list should be kept where there is a suspected outbreak and where an isolation unit has been opened, but if several isolation units have been opened, the Sub-County should maintain a combined line list. Refer to **Annex 4E** for a sample line list

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

If a potential Public Health Emergency of International Concern (PHEIC) is suspected (as defined in Annex 2 of the IHR 2005), the Sub-County Disease Surveillance Coordinator should report to the DDSR immediately using the fastest means of communication and at same time notify the County Surveillance Coordinator. If a potential Public Health Emergency of International Concern (PHEIC) is detected at Point of Entry, immediate reporting should also be made to the DDSR, while at the same time notifying the Sub-County and County surveillance coordinators (**See Annex 2B** for a framework of reporting).

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.

2.3.2 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 Health Assistant (CHA), if already identified, or to a nearby health facility or Sub-County Medical Officer of Health (SCMOH). Minimum information collected should include:

a) Date of event
b) Date reported
c) Suspected disease, condition, or event
d) What happened?
e) Where did this happen? (Village, Ward, Sub-County, County)
f) Who is affected? (Age, Gender, Occupation etc.)
g) How many have been affected?
h) Has anyone died? If yes, how many?
i) Is the event ongoing?
j) Are there any animal deaths/exposures?
k) Recent history of travel to an affected area
l) Other information you have.
m) Name and contact number of the person reporting
n) Any action taken

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

2.3.3 Summarize immediate and weekly reportable diseases

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

At the Sub-County 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, the designated sub county surveillance officer will analyze immediate case-based forms and weekly aggregated data received. 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 sub-counties. Sub-counties shall store information electronically and forward the surveillance data sets to the next higher level.

2.3.4 Weekly reporting of immediate notifiable diseases

Weekly reporting provides data for monitoring trends of diseases or conditions for early detection of outbreaks. It is important to ensure that the IDSR weekly reporting format is adhered to across all health facilities and Sub-Counties to facilitate comparison within and between
After immediate reporting to the next level, summarize the data into the weekly reporting tool as listed in **Table 6.** See **Annex 2H** for format for developing a weekly summary form which is an aggregate of case-based forms.

With eIDSR (**See Section 9**), this will be updated automatically in the database, while in entities reporting using paper this will be done manually and entered into a computer. This aggregation is important to understand the trend of the immediate reportable diseases and plan for effective intervention. For early detection of outbreaks via weekly aggregated reporting, it is recommended to keep the number of variables at a minimum, ideally reporting only the number of cases and deaths, to avoid unnecessary burden on the healthcare facilities and maximize reporting efficiency.

Based on epidemiological evidence, additional diseases, conditions and events for weekly reporting may be included. Only diseases, conditions or events which could result in public health action should be considered to enter the list of aggregated weekly reporting. Some rare but high-risk public health events should be reported on an immediate basis (e.g., chemical, radiological etc.). The list of priority public health events to be reported by healthcare facilities will be established by a group of relevant stakeholders from and related to the National Public Health Surveillance System.

2.3.5 Zero reporting

If no cases of an immediately reportable 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 submit the required information to the next level. Submitting a zero report for each reportable disease when no cases were detected during the week, makes the report complete, and tells the staff at the next level that investigation was undertaken and no condition was found.

2.3.6 Report monthly 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 county referral or teaching hospitals should report summary totals to the sub-county under their catchment area. Sub-counties/reporting sites should upload reports into the Kenya Health Information System (KHIS) reporting platform, from where, the county, national and other stakeholders can access the data. Each level should observe any unusual increases or events seen during analysis of monthly summary reports. The summary results should be analyzed and the results used to monitor progress toward disease control targets, measure achievements of disease prevention activities in the Sub-County, County or at National level, and identify hidden outbreaks or problems so that a response can be initiated.

Table 6: *Diseases and conditions requiring Monthly reporting*

Acute and chronic viral hepatitis Diabetes mellitus (New cases) Diarrhea with severe dehydration in children under 5 years of age Cancer (Breast, Prostate, Cervical, Esophageal) HIV/AIDS (New Cases) Hypertension (New cases) Injuries (Road Traffic Accidents) Leishmaniasis Leprosy (quarterly) Lymphatic Filariasis Malaria	Malnutrition in children under 5 years Epilepsy Onchocerciasis Severe pneumonia in children under 5 years of age Sexually transmitted infections (STIs) Schistosomiasis Trachoma Trypanosomiasis Tuberculosis (quarterly)

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 and inpatient cases. The summary totals are recorded on a form (see Annex

2H page 195) and sent to the Sub-County level. Sub-counties/reporting sites should upload reports into the Kenya Health Information System (KHIS) reporting platform, from where, the County, National and other stakeholders can access the data.

Surveillance focal persons at all levels shall maintain updated monitoring graphs for key surveillance indicators including: IDSR priority diseases, OPD and IPD trends and unusual public health events. On a regular basis (weekly or monthly), review the KHIS reports to ensure data has been well captured. Data validation shall be conducted weekly for weekly reporting tool (MOH 505) and compared with the monthly reports as entered on the KDHIS by all facilities.

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

Laboratory data should be organized in a register so that it can generate, daily, weekly and monthly summaries. During outbreaks, daily/weekly summaries of the specimens processed, the types of specimens and the results should be submitted to assist in completion of the variables on the line list. Laboratory results should be shared to the requesting clinician as soon as the results are available in support of surveillance and response activities. Monthly summaries will include the tests done for all priority diseases and identified pathogens on the basis of major PHEIC and for AMR surveillance. The analysis can produce important trends which can necessitate further investigations.

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 inpatient nurse tallies the number of admitted cases and deaths.

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

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 by the supervision teams at all levels, ensure that:

a) All reporting sites including secondary and tertiary hospitals in the catchment area of your sub-county are visited.
b) Clinicians record information in a legible manner in the patient registers using the recommended case definitions, so that health workers who tally the cases at the end of the day can reliably record the required diagnoses on the tally sheet.
c) Clinicians, ward nurses or other responsible staff should complete the case-based reporting form preferably while the patient is still present.
d) Clinicians record laboratory results in the patient registers
e) In cases of health facilities with laboratories, the laboratory staff should record results of IDSR priority diseases in the laboratory registers (MOH 240) with linkage to epidemiologic data (relevant IDSR reporting tools)
f) Integration of laboratory results into the IDSR reporting forms should be conducted at the health facility level
g) Records clerks or health record officers have summary forms for recording cases and deaths due to the priority diseases or conditions according to the standard case definitions.
h) Health management teams at all levels should review the weekly and monthly IDSR data summary and take appropriate action based on the results of preliminary data analysis.
i) The surveillance focal persons record the summary totals on a recommended weekly, monthly and quarterly IDSR summary reporting forms **(See Annex 2G page 194).**

2.4.2 Keeping records and procedures for managing reporting forms

Data Clerks / Health Information Assistants / Medical records assistants or Biostatisticians should ensure the following;

a) Keep a record of IDSR forms, notifications and reports received at your level. The record you keep is an essential data source for calculating indicators for the country's IHR report and for monitoring performance of the IDSR indicators.
b) Periodically the supervision team should check with reporting sites they supervise (community, health facility, ward and sub-county) 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.

Specifically, the supervision team should:

a) Take steps to ensure that all health workers know or have access to the standard case definitions recommended by these guidelines. Case definition posters should be strategically placed in all facilities. Make sure the staff has access to a standardized form for reporting case-based information.
b) Ensure adherence to the existing procedures so that all health workers are able to apply the standard case definitions in detecting and reporting priority diseases, conditions, outbreaks or events.
c) 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 the health staff should be aware of epidemic-prone diseases for which a single suspected or probable case is a suspected outbreak requiring immediate action, and of any unusual or unexplained

event with a potential of affecting human health.

d) Review with health staff the role that case-based data plays in determining risk factors and the means of disease transmission or exposure to health risks in a public health event.

e) Ensure that the surveillance unit has access to fast communication means (internet connection, telephone, text message, electronic mail, social media, satellite phones or other rapid communication means). Specify how the sub county should notify the county or national levels and who should be contacted at these levels.

2.4.3 Perform periodic checks on data quality

While each provider may have some preferred methods for filling in forms, describing diseases, or abbreviating terms, it is important for every level of reporting (Facility, sub-county, County or National) to use a standard approach to recording and reporting, as data that are not comparable, will lead to inappropriate decisions.
Some of the examples of factors which may affect data quality that needs to be periodically checked include:

- 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 late reporting,
- Inconsistent reporting periods,
- Calculation errors on aggregate reports,
- Lack of documentation, source Data or files are lost.

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

2.4.4 Enhance linkages to strengthen community-based surveillance

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

directly to the sub-county authorities.

2.4.5 Community representatives that can be members of CBS team

Representation could be from basic village-level services such as skilled birth attendants, community health volunteers, village leaders (religious, traditional or political), school teachers, community disease reporters (CDR), community health assistants, local pharmacists/agrovets, and traditional healers. Once selected, the CBS informant should sensitize on how to recognize certain diseases or health conditions for the purpose of reporting suspect cases.

Example: CBS informants hear of several cases of acute watery diarrhea with vomiting in the community. The informant suspects cholera and reports the signal to the community health volunteer, who then reports to the link health facility by the fastest means of communication e.g., text messaging. Members of the rapid response team (RRT) travel to the community to verify and investigate the possible outbreak, and, based on the investigation results, implement control and prevention measures. The outbreak is quickly contained. Thanks to the early warning from the community-based surveillance liaison.

Sub-county health management team (SCHMT) may identify sources in the community with opportunity to know about the community's health status. Examples of community sources include:

- Local pharmacists and agrovets
- Staff at private clinics
- Village elders
- Religious leaders
- Traditional healers
- Skilled Birth attendants.
- Community health volunteers
- Community Based Organizations (CBOs)
- Other societal leaders
- Community Disease Reporters (CDR)
- Any individual involved in neighborhood watch or other active surveillance approaches

Other community resource persons
Depending on the event, resource availability and the context, the community can identify the source of information. The sub-county can organize community-based surveillance focal points by:

a) Working with community leaders e.g., community health committees, to identify members of the community to receive relevant sensitization.
b) Sensitize and provide job aids (e.g., leaflets of cases definitions, posters etc.) on priority diseases and public health events or hazards to community health informants. Give enough information about the disease so that the community source can refer cases to the health facility, or notify the health facility when unusual or unexplained health events occur in the community

c) Involve CBS informants in risk mapping, emergency simulation exercises and risk communication during outbreaks
d) Ensure that there is regular and timely feedback of diseases/events reported to the community level.
e) Sub-county needs to ensure that there is sustained commitment by CBS informants, and hence to continuously engage them.
f) Disseminate alert and action thresholds

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

2.4.6 Strengthen linkages between Laboratory and Surveillance information

Public health laboratory system complements the 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 sub county and county.

To strengthen the linkages between epidemiological and laboratory data, the case reported and the lab samples should have the same unique ID.

Submission of the weekly summaries of the samples processed, and the types of samples as well as the results, should be done whenever there is an outbreak, to assist in completion of the variables in the line list register.
During supervision at reporting sites, liaise with the laboratory in charges to ensure that the laboratorians, record correctly data for diseases under surveillance and also that there is an established register.

Make sure that the test results are linked with IDSR data at national, county and sub-county levels.
The laboratory component of the IDSR Weekly or Monthly Summary Reporting Forms should be regularly updated, immediately the respective disease lab results are ready.

Liaise with the animal sector, so as to have a comprehensive report also from Veterinary laboratory especially if they have recorded any animal information which might have risks to public health.

2.4.7 Promote a multi-sectoral, One Health approach with effective involvement from human, animal, and environmental health sectors as wells as other relevant sectors to strengthen reporting

Ensure implementation of the One Health approach to improve reporting and mitigating public health risks across all levels, with emphasis at the community level. Emphasize on strengthening the technical and community capacities of staff for all relevant sectors {including human physicians, nurses, veterinarians (livestock and wildlife) and environmental inspectors}.

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 to formalize the system of sharing information with other sectors i.e., human health, animal health, environmental health etc.

The other multi-sectoral key actors to foster collaboration in reporting and assessment of public health risks include: private sector, civil society, faith-based organizations, UN agencies, defense and security forces, prisons, Internally Displaced Persons (IDP) and refugees' camps, technical and financial partners, academic and research institutions. Ensure that they are also included to strengthen routine reporting and analysis of public health risks and events.

2.5 Data protection and security to protect patients' confidentiality

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

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

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

Annexes to Section 2

Annex 2A: IHR 2005 Decision Instrument

Annex 2B: Algorithm of reporting immediate notifiable events/diseases

Annex 2C: Community Alert Form for reporting of event from community sources

Annex 2D: Community-Based Surveillance Suspected Diseases and Public Health Events Monthly Log Sheet

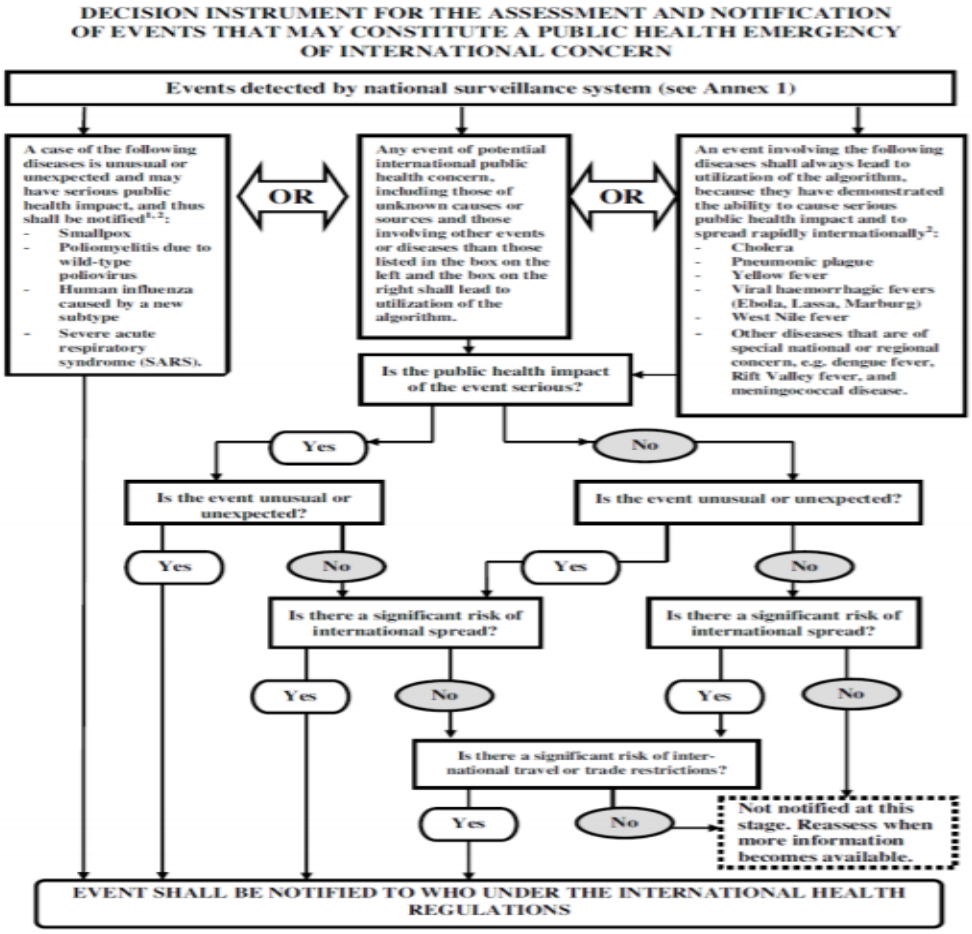
Annex 2E: Reporting Structure for community alert and verification

Annex 2F: IDSR immediate case-based reporting form

Annex 2G: IDSR: IDSR Line Listing Form

Annex 2H: IDSR weekly/monthly summary reporting form

Annex 2A: IHR 2005 Decision Making Instrument



[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

Figure 11: *IHR 2005 Decision Making Instrument*

Annex 2B: Community signal reporting form

[Send this form immediately to your supervisor or nearby health facility]
Instructions: This form is completed by the CEBS focal person and submitted immediately to nearest health facility/sub-county surveillance focal person when he or she identifies disease (s) or public health event as per the community case definition. It is also completed for unusual health events/alerts that are not captured by the given case definition.

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

Annex 2C: Community-Based Surveillance (CBS) Suspected Diseases and Public Health Events Monthly Log Sheet

Instructions: This form is for listing of all the diseases/events/alerts identified during the month. It should be completed by the CBS focal person (CHA) and submitted monthly to nearest health facility/sub county disease surveillance coordinator every month.

Community-Based Surveillance Suspected Diseases and Public Health Events Monthly Log Sheet						
County_____ Sub County/ Ward_____ Community: _____Month_____ Year_____						
Serial Number	Type of illness/ Condition/Event/Alert	When did this happen? (DD/MM/YYY)	Where did this happen (Community, Ward)	How many have been affected	How many died	what action was taken

Annex 2D: Reporting Structure for community signal and verification

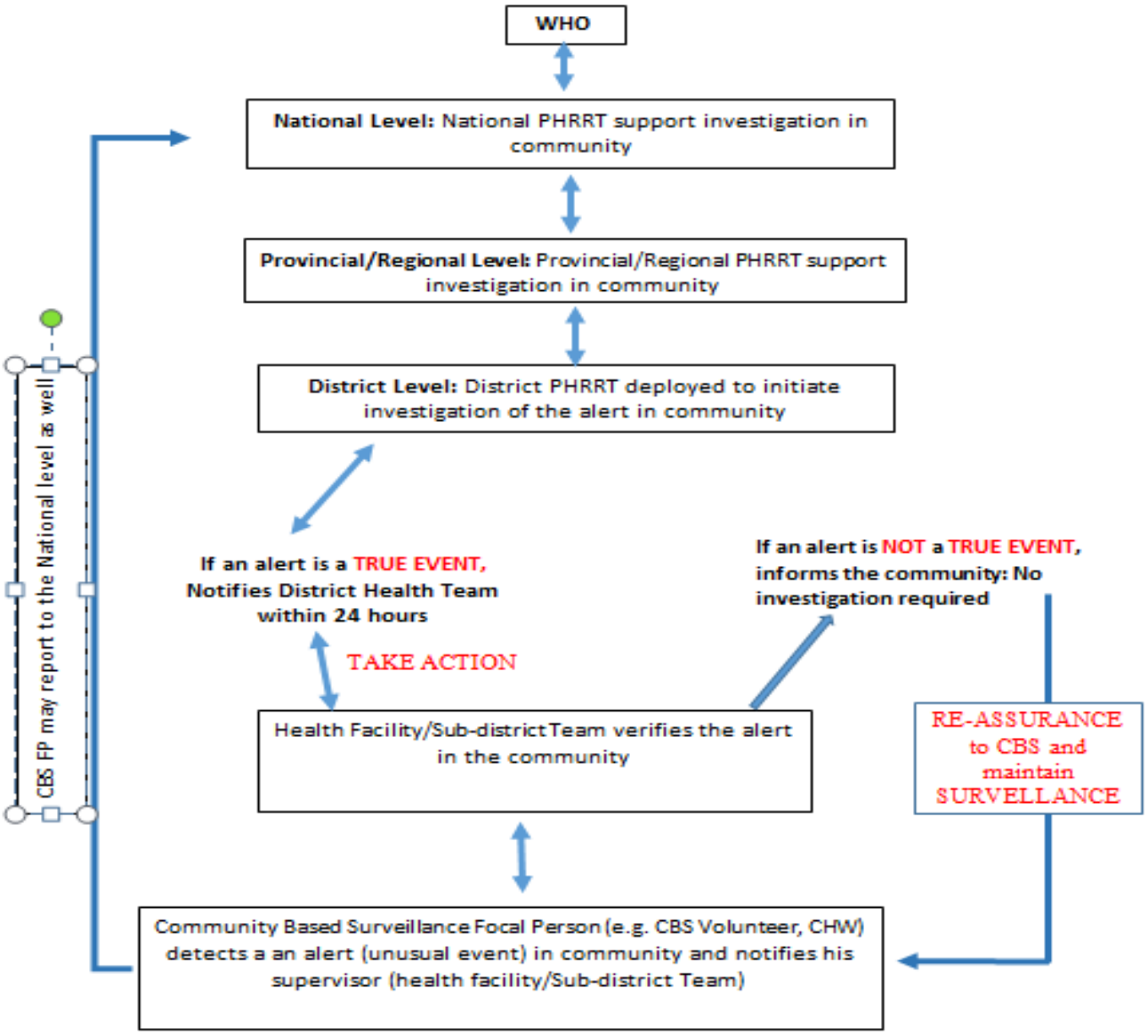


Figure 12:*Reporting Structure for community signal and verification*

Annex 2E: Reporting Structure for community alert and verification

CEBS information flow

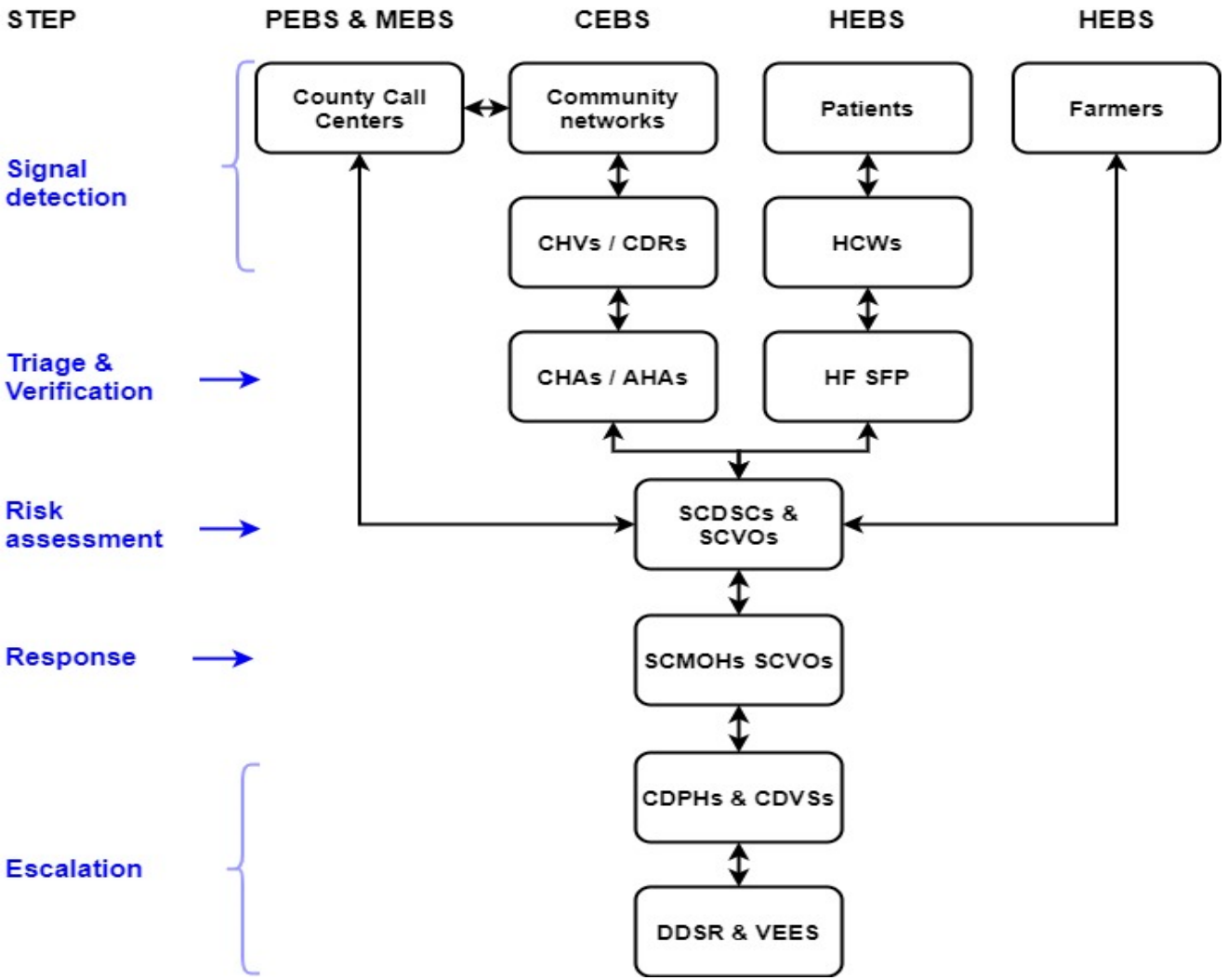


Figure 13: *CEBS information Flow*

Annex 2F: IDSR immediate case-based reporting form

MOH502 MINISTRY OF HEALTH KENYA ED2020

Integrated Case Based Surveillance Form

Use this form for a single case only
Duly complete the form before submission

(To be completed at the National level)
EPID No: ……. …… ……. …….
Country County Sub County Year
Date form received at national level / /

A. Name of Site Reporting & Disease being reported

A1. Health Facility …… **A2**. Type ……
A3. Sub County …… **A4**. County ……
A5. Disease reported (Tick One)
□ □ □ □ □ □ □ □ □
AFP NNT Measles Meningitis Plague VHFs Yellow Fever S. AI Other …… (Specify)
NB: If you suspect AI, Please fill the Avian Influenza Case Investigation form

B. Identification

B1. Name of patient ……..
B2. Sex: 1 = Male 2 = Female **B3**. Age in
B4. D.O.B._____/_/_____ Years Months Days

B5. Residence: Urban Rural **B6**.Tracer information:
a. Parent/Guardian: ……
Residence (Village/Hse No): ……..……
Neighborhood major landmark: ……..……..……
Street/Plot/Estate/S. location: ……..…
e. Town/City/Location: ……
f. Sub County: …… County: ……..……
g. Telephone No of parent/guardian: ……

C. Clinical Information

C1. Date of onset of illness____/_____/_____ **C2**. Date first seen at health facility: / /
C3. Date Health facility notified sub County level:____/_____/_____ **C4**. Hospitalized: 1= Yes 2=No Date of Admission_____/_/_____ **C5**. IP/OP No. ……
C6. Diagnosis: ……
C7. Means of diagnosis: Clinical Lab Epi linkage

D. For Acute Flaccid Paralysis (AFP) Case Only

(To be filled by a clinician only)

D1. Date of onset of paralysis: / /

D2. Signs and symptoms: 1 = Yes 2 = No
Fever at onset of paralysis Sudden onset of paralysis Paralysis progressed < 3 days Flaccid (floppy)
D3. Site(s) of paralysis: Left leg Right leg Left arm Right arm

Name ……..**Tel. No**……

D4. **Follow-up Examination** to be done after 60 days from onset of paralysis using the 60 days follow up form

E. For Neonatal Tetanus Case Only

E1. Delivery practices
Where was the baby delivered?
Health facility (Name): ……..
Home by trained attendant Home by untrained attendant Unknown
Was the cord cut with sterile/clean blade? 1=Yes 2=No 9=Unknown
How was the cord stump treated or dressed? ……..

E2. Baby's symptoms
How old (in days) was the baby when the symptoms began?
Days Unknown
At birth, did the baby suck normally? 1=Yes 2=No 9=Unknown
Was the case confirmed as neonatal tetanus (if yes to the last 3 questions)? 1=Yes 2=No 9=Unknown

E3. Treatment
Was the baby treated at a health facility? 1=Yes 2=No 9=Unknown
Is the mother alive? 1=Yes 2=No 9=Unknown
(If no, complete case investigation form for maternal deaths)

F. For Measles Case Only

F1. Presence of fever: 1=Yes 2=No
F2. Date of onset of rash:___/ /
F3. Type of rash: Maculopapular Other _____
F4. Was home of patient visited for contact investigation?
Yes (Date):_____/_____/_____ No
F5. Is the case epidemiologically linked to a lab-confirmed case?
Yes No Unknown

G. laboratory Information

G1. Specimen collection *(To be completed by the health facility)*
If lab specimen was collected, complete the following information and send a copy of this form to the lab with the specimen
For AFP don't collect specimen if onset of paralysis is more than 60 days old

Was specimen collected? 1=Yes 2= No
If no, why? ……..
……..…….
Date(s) of specimen collection: / / and / /
Specimen type: Stool Blood CSF OPS NS Animal tissue
other (specify ……
Date specimen send to the lab: / /
e. Name of the lab:……..
G2. Lab results
Received (provide)……
Not yet received

H. Sub County Contact Person

H1. Form completed by: ……
Designation: ……..... Sign: ……
H2. Sub County contact person details: Name: ……..
Designation: …… Phone No: ……..
Email: ……

Other (specify): ……

C8. Vaccination History for disease under investigation [Measles, AFP (exclude birth dose of OPV), NNT (TT in mother), Yellow fever, Meningitis and suspected Avian Influenza]

a. Was the patient vaccinated against illness (including campaign)?
1 = Yes 2=No 9= unknown. If yes, no of doses: ……

b. Any vaccination given in the last two months? 1= Yes 2= No 9= unknown. Date of vaccination/ _/_____

C9. Status of the patient:
Still hospitalized Discharged Dead

E4. Case Response: [Sensitize TBAs and community leaders on safe delivery practices and cord care. Provide booster TT doses to mother of NNT case and women of child-bearing age in community.]

Did case response for the mother take place? 1=Yes 2=No 9=Unknown

Did a case response take place in her community? 1=Yes 2=No 9=Unknown

Final Laboratory Results

(Please indicate the final laboratory results in detail)

NS: Nasal Swab
OPS: Oropharyngeal Swab
S. AI: Suspected Avian Influenza

Comments: _____

Figure 14: *MOH 502*

Annex 2G: IDSR Line Listing Form

Line Listing Form (MOH 505)

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IDSR Health Facility Line-listing Form

Health Facility:_____Sub-county:_____ County: __

Disease/Condition/Event:_____ Date received at Sub-county: __

A	**B**	**C**		**D**		**E**	**F**	**G**	**H**	**I**	**J**			**K**		**L**
No	Names	Patient Status (tick as appropriate)		Village or Town and Neighborhood ***(Indicate major landmarks)***	Contact Tel. Number	Sex	Age[1]	Date seen at health facility	Date of onset of illness	No. of doses of vaccine (Exclude doses given within 14 days of onset)[2]	Lab Tests			Outcome		Comments
		Out patient	In patient								Specimen taken (Yes/No) If yes, date collected		Lab results	A-Alive	D-Dead	
											Date	Type				
(1)																
(2)																
(3)																
(4)																
(5)																
(6)																
(7)																
(8)																
(9)																

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

[2] Include campaign (NIDs, SIDs) doses

Figure 15: *Line Listing Form (MOH 503)*

Annex 2H: IDSR weekly/monthly summary reporting form

Edition 2020 MINISTRY OF HEALTH MoH 505
IDSR Weekly Epidemic Monitoring Form
County___Sub County_____Health Facility_____Epi Week_Week ending_____Month___Year_____
No. of Health Facilities/Sites that reported No. of Health Facilities/Sites expected to report ____

Diseases, Conditions or Events	< 5 years		≥ 5 years		**Diseases, Conditions or Events**	< 5 years		≥ 5 years	
	Cases	Deaths	Cases	Deaths		Cases	Deaths	Cases	Deaths
AEFI*					Meningococcal Meningitis				
Acute Jaundice					Neonatal deaths				
Acute Malnutrition					Neonatal Tetanus				
AFP (Poliomyelitis)**					Plague				
Anthrax					Rabies				
Cholera					Rift Valley Fever				
Dengue					SARI (Cluster ≥3 cases) *****				
Dysentery (Bacillary)					Suspected MDR/XDR TB				
Guinea Worm Disease					Typhoid				
Measles					VHF******				
Suspected Malaria***									
Deaths due to Malaria****					Yellow Fever				
Maternal deaths					Others (Specify)*******				

Laboratory Surveillance										
Disease	**Microscopy**			**mRDT**				**Disease**	**Laboratory diagnosis**	
Malaria	< 5 years	≥ 5 years	Total	< 5 years		>5 years		**Dysentery**	< 5 years	≥ 5 years
Tested								Tested		
Positive								Positive (S. **dysenteriae)**		
Bacterial Meningitis	No CSF	No contamin ated	No Tested	+ve Nm	+ve S.Pneum	+ve Hib	Other pathogens	**Tuberculosis (MDR/XDR)**	< 5 years	≥ 5 years
								Tested		
								Positive		
No of CSF Sub-Typed	+ve Nm A	+ve Nm B	+ve Nm C	+ve Nm W	+ve Nm X	+ve Nm Y	Other Nm Ind.	**Typhoid**	< 5 years	≥ 5 years
								Tested		
								Positive		

Reported by:_____Designation_____Sign_____Date ____

Figure 16: *IDSR Weekly Epidemic Monitoring Form (MOH 505)*

Reporting Instructions

The weekly epidemic monitoring tool will be used to summarize data for the previous epidemiological week An Epidemiological week starts from Monday to Sunday

The facility Disease surveillance focal person will submit the form by Monday of every week to the SCDSC and retain the duplicate The source of the data will be outpatient registers MoH 204 A&B, Inpatient registers, Lab registers

The SCDSC will review the facility report for correctness, then inputs into KHIS

*Adverse Events Following Immunization

**Suspected malaria = all tallied as code 1,2,3,4, & 5 in the outpatient register column 'T' in MOH 204A and column 'R' in MOH 204B Malaria microscopy tested = all tallied as code 3&5 in the outpatient register column 'T' in MOH 204A and column 'R' in MOH 204B Malaria microscopy positive = all tallied code 5 in the outpatient register column 'T' in MOH 204A and column 'R' in MOH 204B Malaria RDT tested = all tallied as code 2&4 in the outpatient register column 'T' in MOH 204A and column 'R' in MOH 204B Malaria RDT positive = all tallied code 4 in the outpatient register column 'T' in MOH 204A and column 'R' in MOH 204B

****Deaths due to malaria

*****Acute Flaccid Paralysis

******Viral Hemorrhagic Fever: May be due to Ebola, Marburg, Rift Valley Fever, Crimean Congo Hemorrhagic Fever

*******Any public health disease, condition or event of National or International concern (infectious, zoonotic, foodborne, chemical, radio nuclear or due to unknown condition)

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE GUIDELINE FOR KENYA

THIRD EDITION



SECTION 3: ANALYZE AND INTERPRET DATA

May 2022

SECTION 3: ANALYZE AND INTERPRET DATA

3.0 Analyze Data

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

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 analyzed at each level where it is collected. Organizing and analyzing data is an important function of surveillance. Data analysis provides the information that is used to make relevant, timely, and appropriate public health action. Analysis of surveillance data allows:

- Observing trends over time and alerting health staff and relevant stakeholders about emergent events or unusual patterns
- Identifying geographic areas affected and risks profiling
- Characterizing person variables such as age, gender, or occupation among others.
- Monitoring and evaluation of Public Health interventions

In general, analysis of 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 (this week, for example)? 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 periods this year or the previous year? For example, is the problem increasing when compared to the same period in the previous years? Does it portray seasonality?
- Are the disease trends stable, improving, or worsening?
- Is the reported surveillance information representative enough for the reporting sites in the catchment area? Out of all the sites that should report, what proportion has been reported?
- How timely were the data received from the reporting sites?
- Who is affected? Which occupational group are most at-risk?

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

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 up to the National level. A reporting site is a site that reports about surveillance and outbreak data to the next level. This includes all health facilities (public, private, and faith-based), standalone laboratories, and POE. The reporting site is also responsible for event reports from community surveillance and response.

A health facility is a surveillance site. The data collected from the site is compiled in standard forms (Immediate, Weekly and Monthly IDSR Summary Reporting Forms, (Case-based Investigation forms, Line listing forms, etc.), analyzed, and then forwarded to the sub-county health management team. In facilities with access to KHIS, data is uploaded into the system, while the facilities without access to KHIS, send their reports to Sub County Health Management Team for uploading into the KHIS and the sub-county health management team can access compiled information from a computer (**Refer to Section 9** *on eIDSR)*. The Community Health Assistant (CHA) collates data from community health units then submits it to the link health facility. The health facility submits the summary community and facility surveillance data to the sub-county to upload their data to KHIS.

Data protection and security must be ensured. Care must be taken not to leave documents containing personal health information related to notifiable conditions on work desks or anywhere they may be visible to unauthorized people. Hard copies of identified notifiable conditions should be filed and stored in locked cabinets in a secure location. Data that is electronically saved should be password protected with appropriately restricted access. Network hardware and any backup or copies of notifiable conditions data must be password protected and stored in a secure location.

3.1.1 Data received

The surveillance team at each level or reporting site where data is received should:

- Acknowledge receipt of the data/report.
- Log into an appropriate logbook any data set or surveillance report received from any reporting site **(Refer to annex 2G in Section 2).**
- Verify whether the data set arrived timely or 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) is filled out accurately
- Ensure that the form is filled (e.g., no blanks)
- Check to be sure there are no discrepancies on the form. Verify from the reporting site (by phone, e-mail, or text message) and correct any discrepancies
- Data entry is done and stored in a database

3.1.2 Enter and clean the data

At each level where data is received (health facility, sub-county, county, national), the surveillance team should always liaise with the designated officer to extract the priority IDSR diseases from

the register and enter correctly into aggregated IDSR reporting forms while listing data from all the reporting sites. Troubleshooting and cleaning data before analysis is an important data management practice. Disease trends and maps will not be accurate if information about the 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 patient log-books/registers or reporting forms. Emphasize that patient logs 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 facility personnel know the algorithm for reporting including reporting levels. Also, ensure information (rumors) is also recorded in the Rumor log book. The registers, which are used are the OPD and IPD registers and the surveillance focal person should always liaise with the HRIO, to extract the priority disease of IDSR from the registers.

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

- Update aggregate totals for each week or month that data was received.
- Record a zero when no cases were reported. If a space that should have been filled in is left blank or has a dash or not applicable, the next level may have an incorrect picture of the situation. They will not know if data are missing or if no cases were reported. Zero reporting allows the next level to know that surveillance did not detect a case of a particular disease or condition.
- Ensure that weekly totals include only those cases or deaths reported for that 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 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 are done by linking to the respective case record unique identifier

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

During an outbreak, ensure data is collected using the designated MoH 503-line list as updated from time to time.

3.2 Analyze Data by time, place and person

The definition of data analysis is the process of systematically applying statistical and/or logical techniques to describe, illustrate, condense, recap, and evaluate the data. Findings from data analysis may trigger subsequent responses to an outbreak, condition, or public health event. Data analysis should be done by time, place, and person **(refer to Table 7**).

Table 7: *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 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), describe the number of cases by day/week/month	Record summary totals in a **table** or on a **line graph** or **histogram or sequential maps**
Place	Identify where cases are occurring (for example, to identify high risk area or locations of populations at-risk for the disease)	Plot cases on a map and look for clusters or relationships between the location of the cases and the health event being investigated. (e.g., cases near a river, cases near a market)	Plot cases on a spot map of the sub-county 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 in a map will assist in the quick assessment and allow prompt intervention

Person	Describe reasons for changes in disease occurrence, how it occurred, who is at greatest risk for the disease, and potential risk factors	Depending on the disease, characterize cases according to the data reported for case-based surveillance such as age, sex, occupation, place of work, travel history, immunization status, level of education, and other known risk factors for the diseases	Extract specific data about the population at-risk and summarize in a **table or a bar chart or a pie chart**

3.2.1 Data analysis by time

Data analysis by time is to capture change, seasonality, periodicity of the occurrence of public health events of medical importance. Data can be analyzed manually or by using software and presented by words, tables, graphs, etc.

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 some time.

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

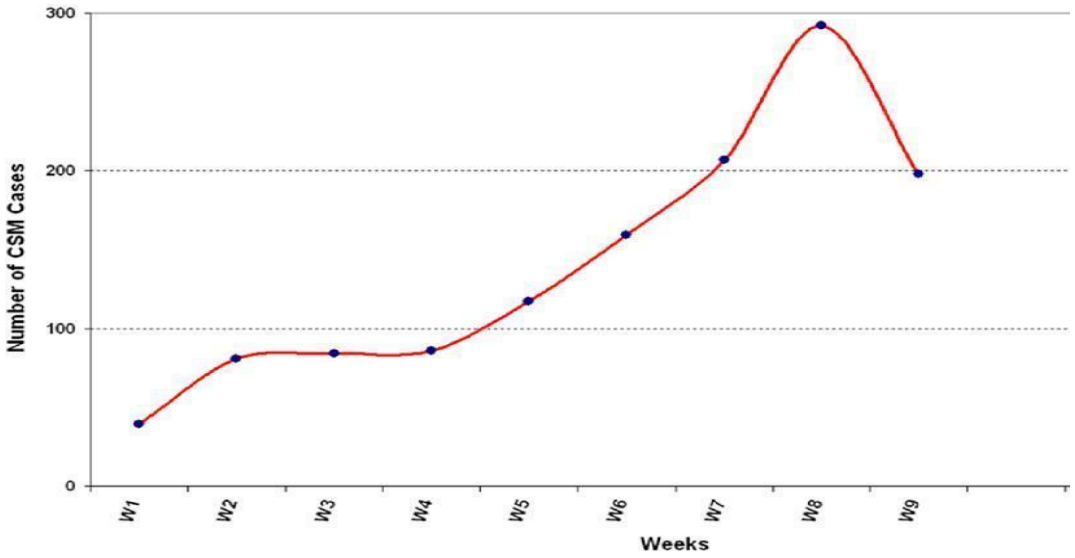


Figure 17: *Weekly trend of reported Cerebrospinal Meningitis cases, West Pokot County, Epidemiological weeks 1-9, 2019*

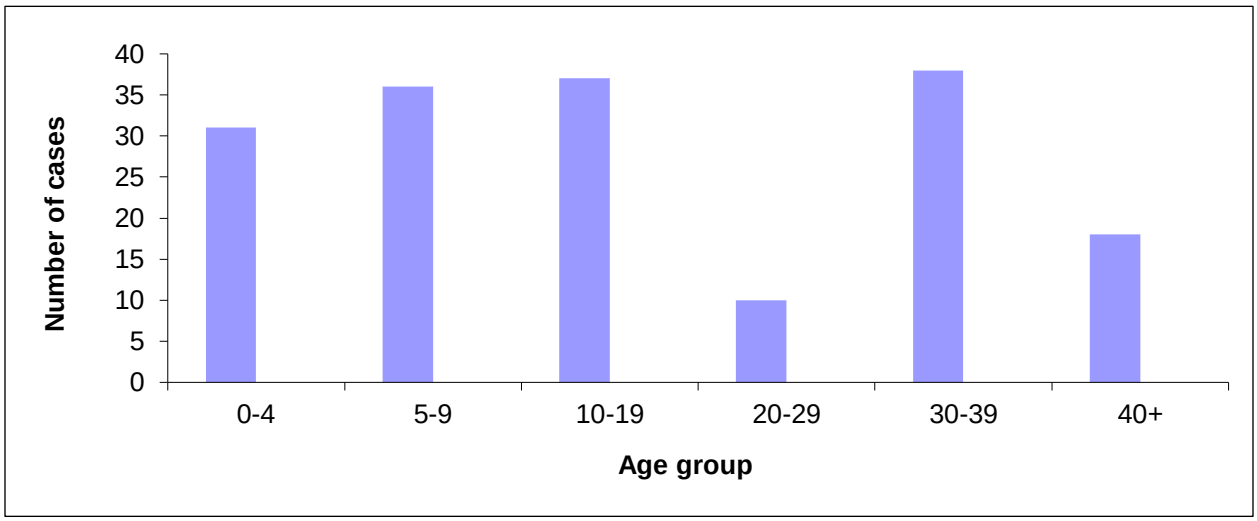


Figure 18: *Example of a bar graph: Age distribution of diarrheal cases during an outbreak in Hola town, 2021*

Using a histogram

Prepare a histogram using data from the case report forms and line lists. Plot the 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.

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

- Onset of the first (or index) case
- The health facility notified the sub-county
- The first case was seen at the health facility
- The sub-county began the case investigation
- Lab confirmation of the outbreak
- A response initiated
- The sub-county notified the higher level

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

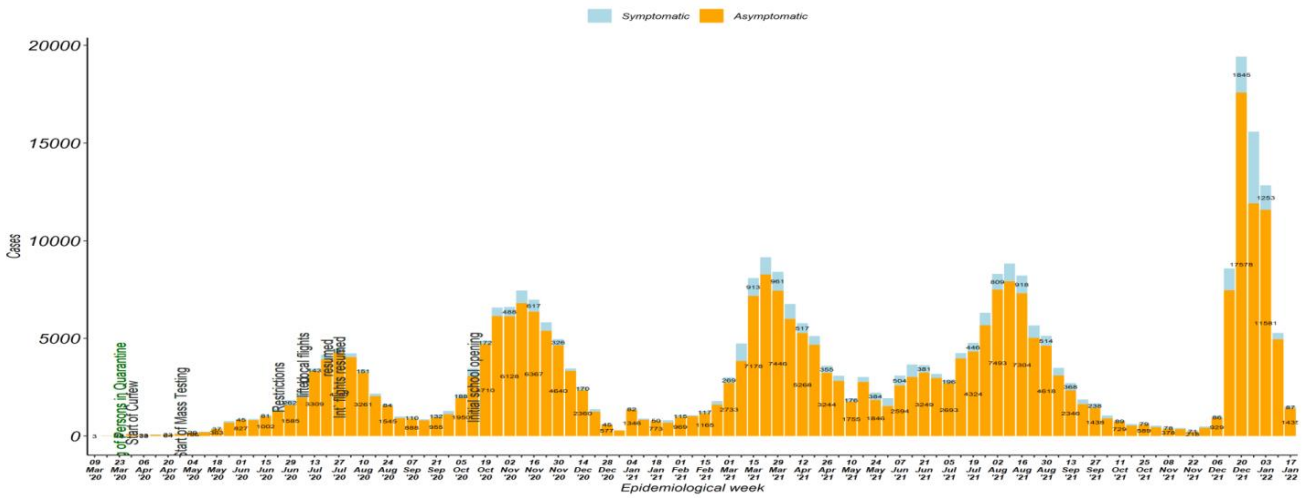


Figure 19: *Example of a histogram (epidemic curve): Trends of COVID-19 pandemic in Kenya, March 2020-January 2022*

3.2.2 Data analysis by place

Data analysis 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 particular areas
- Travel patterns that relate to the method of transmission for this disease
- Common sources of infection for these cases.

Use manual methods or Geographic Information System (GIS) software, such as ArcGIS, QGIS, or any other Geographic Information Software to create maps to use as part of routine analysis of disease surveillance 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. For example, a map for neonatal tetanus includes locations of traditional birth attendants and health facilities where mothers deliver infants. Location of the patients' residences or most relevant geographical characteristic for this disease or condition (for example, by village, neighborhood, work camp, or refugee settlement). Another example is when mapping young patients during a meningitis outbreak; remember to locate the school that the patients attend or other locations as appropriate to the disease or condition being investigated. Please see **Section 11**, for disease-specific guidelines for specific recommendations for analyzing data by place.

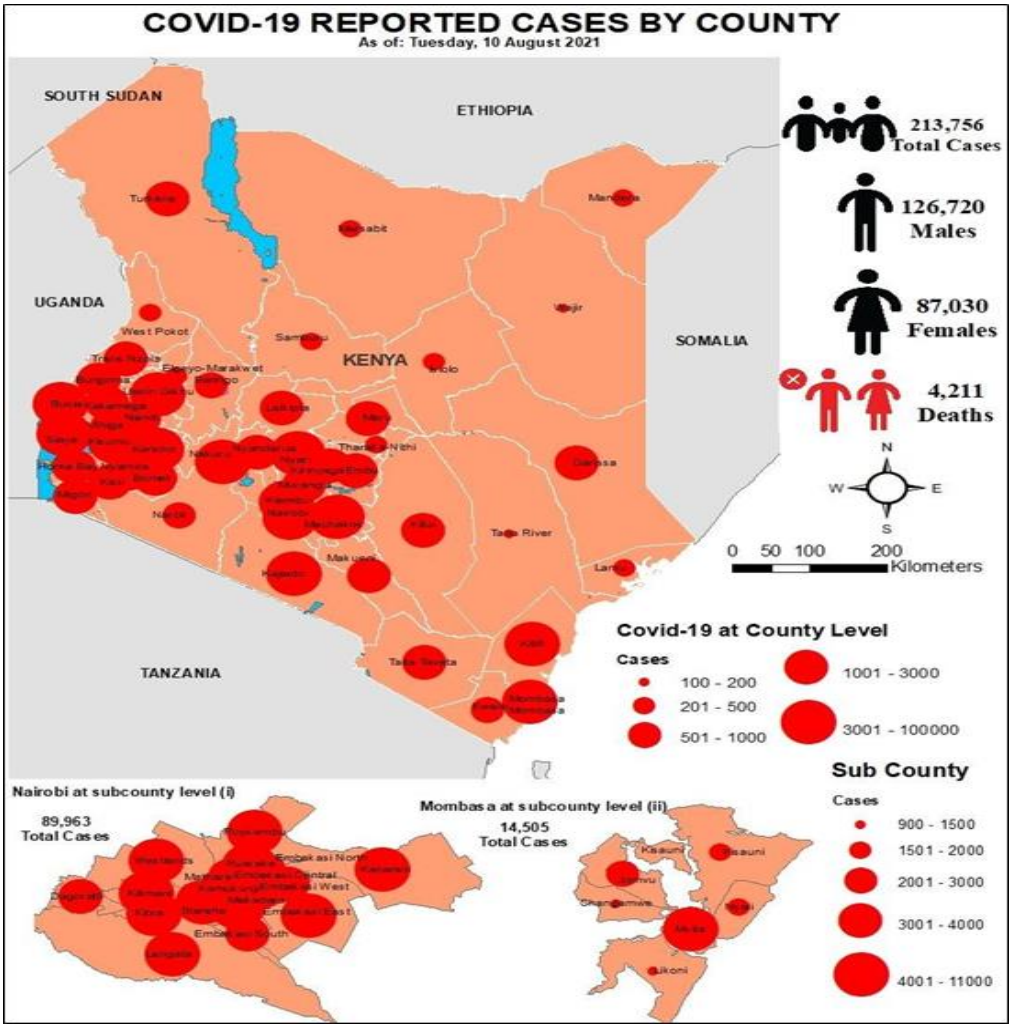


Figure 20:*Example of a spot map using GIS software showing the concentration of COVID-19 cases in Kenya, 10th August 2021.*

3.2.3 Data analysis 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

- History of travel to disease-infected areas
- Risk factors
- Outcomes
- Final classification

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

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

Identifying numerators and denominator

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 sub-county. Simple percentages and rates are useful for comparing information reported to the sub-county. The first step in analyzing person data is to identify the numerator and denominator for calculating percentages and rates.

The ***numerator*** is the number of specific events being measured (such as the actual number of cases or deaths of a given disease, for example, the number of cases of 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

Percentages can be calculated to compare information from populations of different sizes. For example

Table 8: *Number of measles cases this year in school age children seen at Health Facility A & B*

Health facility	**Number of measles cases this year in school-age children**
A	48
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.

***Table 9**: Number of school-aged children living in the catchment area of Health Facility A & B*

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 SCDSC can compare the impact of the illness on each facility. The numerator is the number of new cases that occurred over one year. The denominator is the number of school-aged children at-risk in each catchment area. The measure obtained is called incidence rate or attack rate. In this example, the incidence rate is higher in health facility B than in health facility A.

***Table 10:** Incidence of measles per 100 school-aged children during last 12 months*

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

3.2.4 Tables for person analysis

For each priority disease or condition under surveillance, use a table to analyze the 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 simply. 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:

- Decide what information you want to show on the table. For example, consider the analysis of measles cases and deaths by age group
- Decide how many columns and rows you will need. Add an extra row at the bottom and an extra column at the right to show totals as needed. In the example, you will need a row for each age group, and a column for each variable such as age group or cases and deaths.
- Label all the rows and columns, including measurements of time. In the example below, the analysis is done yearly. Analysis by person is also recommended for the analysis of outbreak data.
- Record the total number of cases and deaths as indicated in each row. Check to be sure the correct numbers are in the correct row or column.

Table 11: *Frequency distribution of measles cases by age group in the catchment of health Facility A & B*

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

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

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

To calculate this percentage:

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

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

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

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

Table 12: *The proportion of cases by age groups in the catchment area for Health Facility A & B*

Age group	Number of reported cases	Proportion of reported cases in each age group (Percentage)
0-4 years	40	51%
5-14 years	9	12%
15 years and older	1	1%
Age unknown	28	36%

Total	78	100%

3.2.6 Calculate the attack rates

The attack rate is a measure of the 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. The 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. Attack rate =16/800 =0.02

0.02 x 100 = 2.0, i.e., 2 cases per 100 population = 2.0%

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

3.2.7 Calculate a case fatality rate (CFR)

Case Fatality Rate (CFR) is the proportion of persons with a particular condition who die from that condition.

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 the poor quality of care or no medical care.
- Compare the quality of case management between different catchment areas, towns, and sub-counties.
- Assess health-seeking behaviors
- 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. E.g., Cholera CFR should be below 1%.

To calculate a case fatality rate:

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

- Divide the total number of deaths by the total number of reported cases. (For example, the total number of reported cases is 78. The number of deaths is 5. So, divide 5 by 78. 5 ÷ 78 is 0.06.)
- Multiply the answer times 100 (0.06 X 100 equals 6%).

Table 13: *Case Fatality Rates for the various age groups for the cases recorded at Health Facility A & B*

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

Compare analysis results with thresholds for public health action

Thresholds are markers that indicate unusual situations 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?" Information on establishing thresholds is in **Section 4.1** of this guide.

Thresholds are based on information from two different sources:

- In some instances, there might be already 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 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 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.

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

In other situations, some cases will trigger a response. For example, the action threshold for bacterial meningitis in countries of the meningitis belt is 10 suspected cases per 30,000 - 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 three weeks (minimum of 2 cases in one week), and the alert threshold is 3 suspected cases per 30,000 - 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

The epidemic threshold for malaria is 3rd quartile of confirmed malaria cases for the past 5 years; the alert threshold is 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 the use of surveillance information for action at the level where it is collected. Periodically, surveillance thresholds are assessed and reset at national or international levels according to the observed trends of the diseases, events or conditions under surveillance.

Suggested thresholds for taking action in specific diseases or conditions are discussed in **Section 11.0.**

3.3 Draw conclusions from the findings to generate information

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

(ii) Systematically review the findings following the sub-county analysis plan (see Annex 3A) if one has been prepared

(iii) Make sure you also correlate the analysis you have done with other data sources, like from animals (domestic or wildlife), or the environment to assist in the correct interpretation of your findings. For example, if you have seen several 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.

(iv) Consider the 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)

obvious fluctuations (sharp increase or decrease per month, per event)

Ensure the KHIS has the following features to improve data quality:

- Data input validation
- Maximum and Minimum values
- Validation rules
- At a minimum, review the findings to assess whether the situation is improving or not, and compare the observed data to the expected data

Consider possible explanations for an apparent increase in cases

a) Has there been a change in the number of health facilities reporting information?
b) Has there been a change in reporting procedures or surveillance systems?
c) Has there been any change in the case definition that is being used to report the disease or condition?
d) Is the increase or decrease a seasonal variation?
e) 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?
a) Has there been recent immigration or emigration to the area or an increase in refugee populations?
b) Has there been any change in the quality of services being offered at the facility (for example, lines are shorter, health staffs are more helpful, drugs are available, and clinic fees are charged)?
c) Is there an increase or improvement in laboratory testing / diagnostic procedures?
d) Is there an increased awareness of the disease in the public? E.g., a mass vaccination campaign and awareness of a particular disease will lead to an increase of cases presented to the facility
e) Is there a backlog of cases being reported that were supposed to be reported earlier?

3.4 Summarize and use the analysis to improve public health action

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

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 staffs who send reports and builds partnership through the transparency that information sharing displays. Thus, it is important to share analysis results and provide feedback on time. Please refer to **Sections 7 and 8** of these guidelines for information and examples about communication and sharing feedback

Annexes for Section 3

Annex 3A: Make a plan for routine analysis of surveillance information and an example of analysis plan for cholera in Country A, 2017

Annex 3B: How to manually make a line graph

Annex 3A: Make a plan for routine analysis of surveillance information

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

- Completeness and timeliness of reporting
- Monitoring whether surveillance reports are received on time and if all reporting sites have reported is an essential first step in the routine analysis of the surveillance system. This assists the sub-county (or another 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 depicts how representative the data is for the specific level.
- Sub-county (or another 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.
- Cumulative totals of cases, deaths, and case fatality rates since the beginning of the reporting period.
- Use of geographic variables (such as hospitals, residence, reporting site, neighborhoods, village, and so on) to analyze the distribution of cases by place. This is information that will help to identify high-risk areas.
- Analysis of disease trends for at least the diseases of highest priority in your sub-county. Monitor the trends for cases, deaths, and case fatality rates to identify any unusual increases or disease patterns.
- Data validation and quality analysis. Establish a data validation team at all levels. Meetings should be held periodically to review reports. All reports submitted must be checked for consistency with various sources.

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

Example of data analyzed for cholera in County X, 2019				
	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				
sub-county	**Total**	**Outcome**		**Case fatality rate (%)**
		Alive	**Deaths**	
Sub-county 1	**1**	1	0	0
Sub-county 2	**92**	86	6	7
Sub-county 3	**158**	147	11	7
Total	**251**	234	17	7
sub-county		**Population**	**Cases**	**Attack rate per 100,000**
Sub-county 1		179888	92	**51**
Sub-county 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	
	Decide what information you want to show on the graph.
	Write a title that describes what the graph will contain what, where, when e.g., top ten diseases in Kisumu County, January to December 2019).
	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.
	Label the vertical axis, explaining what the numbers represent.
	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.
	Make each bar on the graph the same width.

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES FOR THE REPUBLIC OF KENYA

THIRD EDITION



SECTION 4: INVESTIGATE AND CONFIRM SUSPECTED OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

May 2022

SECTION 4: INVESTIGATE AND CONFIRM SUSPECTED OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

4.1 Investigate and confirm suspected outbreaks and other public health events

Aim: This section describes the steps to follow when conducting outbreak investigations.

Definition: An outbreak is defined as an increase in the number of cases of a disease or an event above what is normally expected in a population in a given geographical 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 **(see Figure 20).** These steps are usually listed in order, but their order of implementation is often non-sequential. Knowing these steps prepares one to conduct an investigation properly, using logic to determine when, how often and to what extent the different steps should be implemented in a real investigation. These steps can also be used to investigate other public health events in an area such as when an increase in chronic or non-communicable disease is detected.

The outcome of an outbreak investigation or other public health event leads to identification and assessment of people who have been exposed to an infectious disease or affected by an unusual health event. The investigation provides relevant information to use for taking immediate action and improving long-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 time, place and person
- 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 recurrence of the outbreak.

4.1.1 Steps of outbreak investigation

a) Verify the diagnosis and confirm the outbreak

The first step in an investigation is to determine whether the reported number of cases is unusual. Baseline surveillance data is a useful resource for making this decision. Verifying the diagnosis through laboratory testing is also important, especially for new or uncommon pathogens.

b) Define a case and conduct active case search

Investigators should establish a case definition by characterizing cases by clinical signs, symptoms and epidemiological information related to time, place and person. Using the case definition, investigators can search for additional cases conducting active case search at health facilities and community level.

Information about possible cases should be organized in a line list and summarized according to time, place and person.

c) Take immediate control measures

If the source of the outbreak is apparent and still a potential threat to public health, appropriate control measures should be taken as quickly as possible. Examples of control measures are; enacting quarantine and isolation.

d) Formulate and test hypothesis

At this point, investigators develop a hypothesis about the cause of the outbreak. Understanding the possible disease pathogen and mode of transmission is useful when creating hypotheses.

e) Plan and execute additional studies

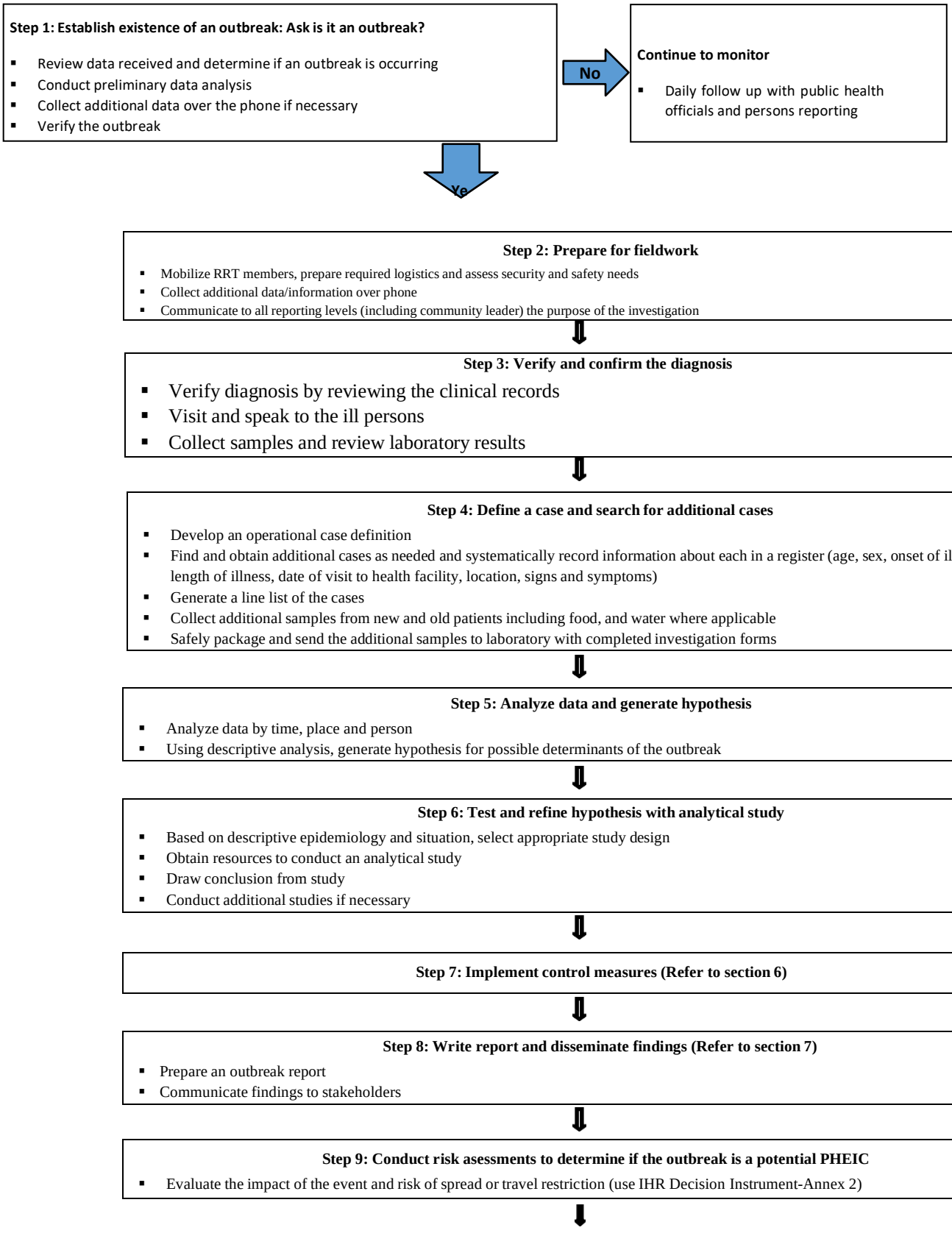
Depending on available resources, investigators may test hypotheses using analytical studies such case-control studies or retrospective cohort studies.

f) Implement and evaluate control measures

Once the cause of the outbreak has been identified investigators should work to implement long-term control measures to end the current outbreak and prevent future outbreaks. These control measures are more extensive than earlier control measures and should be evaluated to determine if they are effective. Examples of such measures are; recommending different food safety procedures in a restaurant, implementing better disinfection protocols at a local swimming pool, and establishing screening programs in local emergency rooms

g) Communicate findings

Throughout the investigations, investigators should communicate findings within their agency, to other stakeholders and to the general public through press briefs, SITREPs and policy briefs. Outbreaks provide a unique opportunity to educate the general public about health promotion and disease prevention.


Step 1: Establish existence of an outbreak: Ask is it an outbreak?
Review data received and determine if an outbreak is occurring
Conduct preliminary data analysis
Collect additional data over the phone if necessary
Verify the outbreak
No
Continue to monitor
Daily follow up with public health officials and persons reporting
Ye
Step 2: Prepare for fieldwork
Mobilize RRT members, prepare required logistics and assess security and safety needs
Collect additional data/information over phone
Communicate to all reporting levels (including community leader) the purpose of the investigation
Step 3: Verify and confirm the diagnosis
Verify diagnosis by reviewing the clinical records
Visit and speak to the ill persons
Collect samples and review laboratory results
Step 4: Define a case and search for additional cases
Develop an operational case definition
Find and obtain additional cases as needed and systematically record information about each in a register (age, sex, onset of illness, length of illness, date of visit to health facility, location, signs and symptoms)
Generate a line list of the cases
Collect additional samples from new and old patients including food, and water where applicable
Safely package and send the additional samples to laboratory with completed investigation forms
Step 5: Analyze data and generate hypothesis
Analyze data by time, place and person
Using descriptive analysis, generate hypothesis for possible determinants of the outbreak
Step 6: Test and refine hypothesis with analytical study
Based on descriptive epidemiology and situation, select appropriate study design
Obtain resources to conduct an analytical study
Draw conclusion from study
Conduct additional studies if necessary
Step 7: Implement control measures (Refer to section 6)
Step 8: Write report and disseminate findings (Refer to section 7)
Prepare an outbreak report
Communicate findings to stakeholders
Step 9: Conduct risk asessments to determine if the outbreak is a potential PHEIC
Evaluate the impact of the event and risk of spread or travel restriction (use IHR Decision Instrument-Annex 2)

Step 10: Maintain and intensify surveillance
▪ National level should maintain contact with the sub-county for daily updates (cases, deaths, No. admitted, No. discharged, areas affected, etc.) until end of epidemic ▪ Sub-counties should intensify surveillance during and after outbreak ▪ Conduct After Action Review and amend tools, strategies, etc based on lessons learnt

Figure 21: *Steps of an outbreak investigation*

Note:

- The responsibility for investigating an outbreak is vested in the Division of Disease Surveillance and Response (DDSR) of the Ministry of Health at national level in conjunction with the county. The county level is the first line of outbreak investigation and response.
- For prioritized diseases, the trigger is when cases reach a defined threshold
- Health staff should promptly investigate the problem and respond to the immediate cases. Preparations for taking a wider public health response should also be made. Alert and action thresholds are also described in **Section 11.0** in detail.
- because the thresholds trigger immediate notification, and are set by national policy
- Still, some urgent health events require investigations to be started immediately. Regardless, sub-counties should aim to investigate suspected outbreaks and events within 48 hours of notification from lower level.

Investigation is commenced when:

- The sub-county 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 confirmation of a case
- Communities or social media reports rumors of deaths or a large number of cases that are not being seen in the health facility.
- A cluster of illnesses or deaths occurs for which the cause is not explained or is unusual (for example, an adult death due to bloody diarrhea, cluster of illness among health care workers, cluster of animals (domestic and/or wildlife) deaths e.g., birds die offs due to avian influenza, livestock deaths due to anthrax, unusual abortion events in livestock).

Verify the reported information

Investigating outbreaks requires human, financial and other logistical 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, the following factors should be considered:

Source of information (for example, is the source of the rumor reliable? Is the report from a health facility or a community or social media?)

- Severity of the reported illness and use of standard case definition for reporting
- Number of reported cases and deaths
- The age and gender of reported cases or deaths
- Mode of transmission of suspected pathogen and 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 have ordinarily been anticipated. For example, reports of a suspected viral hemorrhagic fever cases are treated with more urgency than reports of a less virulent disease because of the potential for high rates of death and rapid transmission.

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

Record reported outbreaks, public health events and alerts

Prepare a tracking matrix for the reported suspected outbreaks, events and rumors to the sub-county. The purpose for tracking reported outbreaks is to ensure that the report of each suspected outbreak or alert is followed by action(s) and resolution(s). Keeping this record will help to gather information for evaluating response processes and attributes like timeliness and completeness of the outbreak investigation.

A sample form for tracking reports of outbreaks and rumors is in **Annex 4A** of this section. If the sub-county is using a sub-county analysis workbook for recording and analyzing long-term trends, the sub-county should include the tracking form in the sub-county rumor log (Log book of alerts).

Where feasible, rumor log (outbreak alerts) should be recorded and managed using electronic event management systems **(refer to Section 9).**

4.2 Prepare to conduct an investigation

4.2.1 Mobilize National and County Rapid Response Team (RRT)

Before embarking on an outbreak investigation, consider necessary preparations. These include preparing 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 needs to pay particular attention to signs and symptoms, case definitions, modes of transmission, diagnostic tests, control measures, etc. Mobilize the sub-county rapid response team (RRT) and make arrangements for investigating the report.

The RRT 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 sub-county coordinator for the disease or event being investigated and 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 advisable to have a database of designated trained public health workers who can rapidly be mobilized to fulfil the following functions;

a) Coordination
b) Surveillance
c) Laboratory confirmation
d) Case management (Clinician)
e) Infection Prevention Control (IPC)
f) Environmental health and sanitation
g) Risk communication and Community Engagement
h) Animal health (as applicable)
i) Logistics

In resource constrained settings, experts that can fulfil more than one of the stated functions may be co-opted into the RRT.

The composition of the RRT should have at least the following:

- A clinician
- Public health nurse
- Laboratory scientists/technologists/technicians
- Surveillance officer
- Epidemiologist
- Entomologist/ parasitologists
- Data manager
- Environmental Health Officer/Public health officer
- Veterinarians/Livestock Officers/Wildlife Officers
- risk communication and community engagement
- Psychosocial Support (PSS) officer
- Logistics officer

Others based on specific characteristics of the outbreak (e.g., expert in water sector–if cholera outbreak or if suspected poisoning from mines- expert on chemicals or radio- nuclear, or experts from foods and drugs authorities if foods and drugs are involved).

Others based on specific characteristics of the outbreak.

Note: Section 5 will describe in detail the composition of other teams in responding to an outbreak and other public health events.

The RRT should develop terms of reference 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. The team should identify the stakeholders or other parties involved. The national and county levels may deploy technical teams to support the sub-counties to investigate and respond to the outbreak/public health emergency as per the national policy.

Standard guidelines and Standard Operating Procedures/methods that are relevant to the disease or condition being investigated (for example, SOP for collecting the correct laboratory specimen, case management guidelines, case investigation forms, line-listing forms) should be included.

4.2.2 Specify tasks of the RRT team members

Health staff should be informed 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 motivate the team members (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 required Personal Protective Equipment (PPE) and universal precautions relevant for the possible cause(s) of the suspected outbreak or event.

4.2.3 Define supervision and communication lines

Make a plan for how the teams will communicate during an investigation. Prepare a diagram showing who will report to whom and how information will move both within the investigation team and between the sub-county and other levels, including the most local level. For example, define who will be responsible for communicating to the Ministry of Health and the Ministry responsible for Livestock, the media and the community. State the methods for communicating and how often it should be done during an outbreak to keep officials informed. Methods may include daily updates by radiophone, mobile phone, electronic mail or conference calls. Show on the diagram the lines of authority and the roles of each staff in the team. Define the role(s) of participating non-health workers and how they should be supervised.

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

4.2.4 Identify 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 case definition. 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.

4.2.5 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 (gate keepers) in the community.

4.2.6 Finalize forms and methods for collecting information and specimens

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

- Record case information on a line list for later use in summarizing variables for use in descriptive analysis of time, place and person
- Fill appropriate request form, label laboratory samples properly and use a unique ID 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
- Develop analysis plan to include risk factors, demographic factors (age group, sex), immunization status and so on.

4.2.7 Arrange transportation and other logistics

Make travel arrangements for getting to and from the site of the investigation and for travelling during the investigation. Make sure transportation for moving specimens to the appropriate laboratories has been arranged in advance of the team's departure. Arrange logistics for essential supplies such as medical supplies, vaccines and PPEs.

4.2.8 Gather supplies for collecting laboratory specimens

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

If a kit is not available in the sub-county, look at the disease specific program guidelines and talk to laboratory specialists to find out the requirements for laboratory supplies for proper collection, storage, and transport of relevant specimens **(refer to Annex 4B).**

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

Note: Refer to the disease specific guidelines in **Section 11.0** for laboratory requirements.

4.3 Verify and confirm the outbreak or event

4.3.1 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). Determine whether the patient can speak for themselves during interviews. If the patient is unable to take interviews personally, determine who can ethically do this on their behalf, including a preferred family member. Ask the patient or a family member who can speak for the patient the following questions:

- Where do you live?
- When did the symptoms begin?
- Who else is sick in your home, school, workplace, village, and neighborhood?
- To where have you travelled recently?
- Where have you been living recently prior to the onset of symptoms (residence at timeof 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 (both domestic and wildlife) recently (for zoonotic infections)?
- Have you been in contact with any sick or dead person?
- Has anybody died in the community you lived in recently?
- Did you participate in any burial ceremony (What role did you play?)
- For suspected Adverse Events Following Immunization (AEFI), what vaccines have youreceived recently?

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

If the disease can be confirmed by laboratory testing, refer to the laboratory requirements in **Section 11.0** to determine the diagnostic test and the specimen that is required. The disease specific laboratory requirements also describe how to collect, store and transport the relevant specimen, and how many specimens to collect to confirm an outbreak for that particular disease. **See Annex 4H** for how to pack samples using a triple package technique.

Note: Some diseases may require additional environmental samples including food stuff for analysis to aid in diagnosis. These samples need to be collected and sent to the relevant laboratories (prior communication and transport arrangement needed) for analysis e.g., suspected water samples for cholera outbreaks; suspected food samples for food borne outbreaks, etc.

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

4.4 Define and search for additional cases

4.4.1 Define a Case

After establishing that an outbreak is occurring, and verifying the correct diagnosis, a crucial step is to define what constitutes a case in this investigation. In **Section 1.0**, a list of Standard Case Definitions for most IDSR priority diseases is already available. Even in situations where a case definition might be available, in specific outbreaks, other details are necessary to be included in the case definitions and these include geographical location, attendance of an event or travel to a certain location. In some circumstances, you might encounter a new disease not listed in **Section 11.0** and you will need to develop an operational case definition. The common elements of a case definition include information on symptoms, date of onset of symptoms, laboratory results, and the essential elements of person, place, and time.

4.4.2 Isolate and treat cases as necessary

Use the case definition to isolate cases. Isolation is a critical step in limiting spread of disease and keeping healthcare facilities open and healthcare workers available. Depending on the suspected disease immediate isolation may be required to protect staff, patients, and community members. Ensure the cases in isolation units have access to facilities like water and toilets. As indicated by the case management guidelines, strengthen infection prevention and control (including isolation of patients if indicated) and case management where the patients are being treated. Provide the health facility with advice, support, and supplies.

Use standard 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.

4.4.3 Search for additional cases

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

Search for suspected cases and deaths in the health facility records

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

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

(ii) Search for contact persons and suspected deaths in the community

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

The areas for the search may be influenced by the disease, its mode of transmission, and factors of risk related to time, place and person. Visit those places and talk to people who had, or were likely to have had, contact with the patient. Ask if they or anyone they know has had an illness or condition like the one being investigated. Find out if anyone else in the area around the case has been ill with signs or symptoms that meet the case definition. Find out if there were any recent deaths. If they say yes find out what were the signs and symptoms 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** of this section for examples of forms for recording and following-up on contacts for additional cases.

4.5 Develop a line list and record information about the additional cases

For each new case, either in the health facility register or in searches from the community that fits the surveillance case definition, record the collected information on a line list register, as well as in the case-based reporting form or other recommended forms. 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 for a sample line list register**). List any contacts on the contact listing form and ensure they are monitored daily for the expected time for signs and symptoms of the disease to develop **(See Annex 4F and 4G**)

Record information of all cases on a "integrated case-based investigation form **(MOH 502)" (See sample Annex 2A**). At least record the following:

a) The patient's name, address, and village or neighborhood and locating information. If a specific address is not available, record information that can be used to contact patients if additional information is needed or to notify the patient about laboratory and investigation results
b) The patient's age and sex. This information is used to describe the characteristics of the population affected by the disease
c) The date of onset of symptoms and date the patient was first seen at the health facility
d) The status of the patient whether dead or alive. If dead, record date of death.
e) Relevant risk factor information such as immunization status if the disease being investigated is a vaccine-preventable disease; occupation if you suspect occupation is related to that particular outbreak.
f) The name and designation of the person reporting the information.

Some diseases have their own more detailed case investigation forms. Detailed forms outlining particular information for investigating specific diseases are in the Annexes at the end of **Section 11.0**.

Complete the integrated case-based investigation form for any new cases **(see Annex 2A**) and record the details on the line list **(Annex 4E**)

4.6 Analyze data about the outbreak

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

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 to, the source of the outbreak (from a single source, for example a well or a funeral), and the persons at-risk of becoming ill (for example, young children, refugees, person living in rural areas, and so on).

Present the data, taking into account time, place and person analysis **(refer to section 3)** in the following way:

- Make tables of the most relevant characteristics for cases (for example, comparing age group with vaccination status, sex ratio, comparing type of occupation in relation to cases etc.).
- Draw a histogram representing the course of the disease (an "Epi" curve).
- Plot the cases on a spot map.
- Calculate case fatality rates **(refer to the steps in Section 3)**

In outbreak situations, apart from Case Fatality rates, you may also wish to calculate Attack rates. **See section 3**, on how to calculate the Attack rate.

4.6.1 Interpret analysis results

Review the analysis results 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 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 point 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 of the examples of the shapes of epidemic curves and possible interpretation

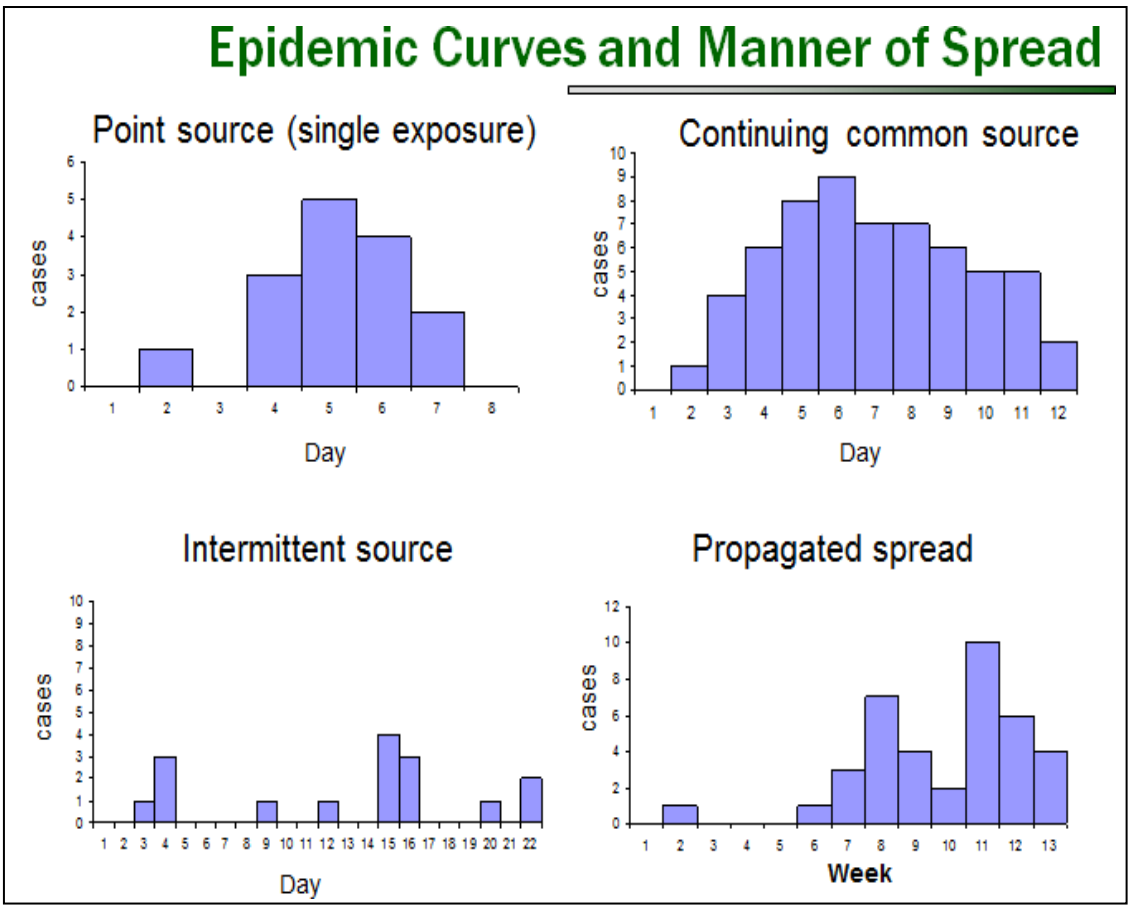


Figure 22: *Types of Epidemic Curves and Manner of Spread*

(ii) Interpret the place analysis results

Use the map to:

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

(iii) Interpret the person analysis results

Information developed from the person's 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.

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

Table 14: *Cholera attack rate by age group, Mukuru Kwa Njenga, Nairobi, March-May 2019*

Age group (years)	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%

4.7 Generate hypothesis

From the observations gathered during the descriptive process, a hypothesis can be generated about the causes of observed patterns and the factors that increase risk for a given outbreak. For example, in Table 4.1 above, one might hypothesize that the older you are, the more likely you fall ill and one might want to determine if age is associated with illness.

4.8 Test and refine hypothesis using an analytical study

Based on descriptive epidemiology, select an appropriate study design. Obtain resources to conduct the study and analyze data. Draw conclusion from the study and as needed refine the hypothesis.

When conducting analytical studies, there are various study designs which can be used. These include, case-control studies, cohort studies or experimental studies. An example of an analytical study (case-control) to test hypotheses can be found in **Annex 4I**. Refer to the references for further guidance on how to conduct analytical studies.

4.9 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 situational reports (SitReps) of the given outbreak and share with relevant stakeholders. **Section 7**, describes various channels of communication during an outbreak

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

- Situation is confirmed as an outbreak or public health event.
- Population affected and at-risk
- Possible causes of the outbreak/ public health event, 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 sub-county rapid investigation team should then immediately prepare an outbreak investigation report. This detailed report of the outbreak investigation should be disseminated immediately to the health facility where the outbreak occurred, sub-county, county and national authorities and also WHO.

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

To understand the spread of the disease one should draw a transmission tree starting with the index case.

Moreover, 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 influences the infection transmission and control measures. Reconstruction of a transmission chain or tree can be done, provided the information is obtained from line list, and also a review of the timeline of dates of onset of illness or contact with other cases, field investigations, and rapid risk assessment. The transmission tree is important as it assists in documenting the routes of transmission in a given geographical area and hence informs planned interventions.

The tree needs to be updated frequently and if a new cluster of cases starts in any part of the sub-county try to ask questions to know if there is any linkage. **See Annex 4J** for an example of how to draw a transmission tree.

4.10 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 sources of the outbreak is identified, control measures should target specific agents, sources, or reservoirs of infection. **Section 11.0** gives 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 at source
- Control of secondary transmission
- 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 response i.e., from community level to other non-health stakeholders who might be key for the particular outbreaks. Examples if you want to enforce by law, you might need assistance from Ministry of Interior and Coordination of National Government
- At some point, during the outbreak setting, public health response might include also testing new potential countermeasures including vaccines and therapeutics. Thus, the conduct of biomedical research can be an important and discrete component of the response. Public health efforts must always remain at the forefront of the overall outbreak response. The research must be conducted in a scientifically sound and ethically acceptable manner to reach definitive conclusions about efficacy and safety as expeditiously as possible. It is the role of the National Level to liaise with relevant Ethical Committees within the country to provide a useful guide for analogous principles in outbreak situations in such settings.

4.11 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 Task Force may be called upon to participate in the risk assessment at the end of which the decision will be made on whether the event is potential PHEIC hence warranting its notification (IHR decision instrument, http://www.who.int/ihr/revised_annex2_guidance.pdf)

4.12 Maintain and intensify surveillance

The national and county levels should maintain contact with the sub-county level for daily updates (cases, deaths, number admitted, number discharged, areas affected, etc.) until 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 variables to be collected using the existing system. This will avoid parallel reporting which can lead to confusion on the progress of the outbreak.

Periodically, report on progress of response, and prepare daily situational reports which can be used to evaluate the response

Update the line list, conduct data analysis by time, person and place.

Continue contact tracing, listing and quarantine where applicable.

Monitor effectiveness of the outbreak response activity.

During investigation, it is also important to intensify surveillance with neighboring sub-counties to ensure the outbreak does not spill to another sub-counties. It is important to share information and also plan for joint surveillance and response activities. Neighboring sub-counties 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.

Conducting regular risk assessment after the outbreak has been confirmed

As soon as the outbreak is confirmed, it is important to conduct regular assessment at each stage of the outbreak. The assessment is needed so as to aid in focusing interventions. The risk assessment should include:

- Evaluating the susceptibility of the population and potential for spread of the event both in the affected as well as neighboring areas
- Evaluating the risk of further transmission, morbidity and mortality. For this, 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; access to health services etc.

A risk assessment should be repeated as new information becomes available. It may also be repeated on a regular timetable. For some events, different risk assessment teams may be required to work collaboratively to assemble the information for a composite picture of the risk (e.g., clinical severity, transmission dynamics, and control measures). At the conclusion of the event, all the risk assessments should be formally reviewed. The systematic analysis of well-documented risk assessments identifies where improvements can be made in the management of acute public health events in future.

Annexes to Section 4

Annex 4A: Log of suspected outbreaks and rumors

Annex 4B: Checklist of laboratory supplies for use in an outbreak investigation

Annex 4C: Recommended list of personal protective equipment

Annex 4D: How to conduct a register review

Annex 4E: Sample line list (MOH 503)

Annex 4F: Contact recording Form

Annex 4G: Contact tracing form (follow-up)

Annex 4H: Triple Packaging of samples

Annex 4I: An example on how to create a transmission tree

Annex 4A: Log of suspected outbreaks (Rumor Log) and alerts

Record verbal or written information from health facilities or 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 (A)	Source of suspected outbreak or rumor (newspaper, telephone etc.) (B)	Number of cases initially reported (C)	Number of deaths initially reported (4)	Location (Health Centre) (5)	Date sub-county was notified (D)	Date suspected outbreak was investigated by the sub-county (E)	Result of Sub-County investigation (Confirmed, Ruled Out, or Unknown) (F)	Date Outbreak Began (G)	Date onset index case (10)	Date crossed threshold or first cluster (1H)	Date a case was first seen at a health facility (1I)	Date specific intervention began (13)	Type of Concrete Intervention that was begun (J)	Date Sub-county Notified National Level of the Outbreak (K)	Date Sub-County received national response (L	Comment (include if sample taken and results) M)	Name and signature

Annex 4B: Checklist of laboratory supplies for use in an outbreak investigation

<table>
<tr><td colspan="2">For using standard safety precautions when collecting and handling all specimens and samples:
_____Pieces of bar soap for hand-washing
_____Disinfectant for decontamination surfaces
_____Supply of PPEs (gloves, mask, gowns, etc.)
_____Triple package
____sample carrier for sample transportation,
_____Safety boxes for collecting and disposing of contaminated supplies
_____Equipment (Biosafety cabinet)</td></tr>
<tr><td colspan="2">For collecting laboratory specimens:</td></tr>
<tr><td>Blood
_____ Sterile needles, different sizes
_____Vacutainer needles and cups
_____ Sterile syringes
_____Vacutainers tubes
_____Screw caped test tube/cryovials for serum
_____ Antiseptic skin disinfectant
_____ Tourniquets
_____ Triple packaging materials
_____ Transport media (Cary-Blair, Trans-Isolate, VTM, etc.)
Blood films (malaria)
_____ Sterile or disposable lancet
_____ Glass slides and coverslips
_____ Slide box
_____Alcohol swabs
syringes</td><td>Cerebrospinal fluid (CSF)
_____ Local anesthetic
_____ Needle and syringe for anesthetic
_____ Antiseptic skin disinfectant
_____ Sterile screw-cupped tubes,
Cryovial, clean tube, sterile gloves, surgical mask, Heparin test tube, sterile gauze, adhesive bandage, lumbar puncture needle,
_____ Microscope slides
_____ Trans-Isolate transport medium
_____ Gram stain
_____ May Grunewald Giemsa Kit
Stool
_____ Polypots
_____ Rectal swabs.
_____ Clean test tubes
_____ Cary-Blair transport medium
Plague</td></tr>
</table>

_____ Blood sample collection tubes _____ Clean cotton gauze _____ Giemsa stain Respiratory specimens _____ Nasal/Oral pharyngeal Swabs. _____ Viral transport medium (tubes)	_____ Negative stain e.g., Methylene blue _____Glass slides _____ Cary-Blair transport
If health facility has a centrifuge: _____ Sterile pipette (disable) _____ Screw-cupped, Sterile glass or plastic test tube, _____Cryovials	
For packaging and transporting samples: _____ Cold (Sample carrier) box. _____ Frozen ice or gel packs _____Dry shipper _____Liquid nitrogen _____ Triple packaging materials _____ Labels	

_____ Case investigation forms _____ Marking pen
Supplies for testing samples. Rapid test kits are suitable in the under-field conditions. Mobile laboratories can be set where need arise All samples are transported to the nearest laboratory with capacity for confirming the suspected outbreak or event.
Protective gear. Appropriate personal protection (PPE), specifically suitable for the suspected outbreak/event

Annex 4C: Recommended list of Personal Protective Equipment (PPE)

The following equipment should be available for the personal protection of all staff investigating a case suspected of highly infectious and/or contagious disease e.g., viral hemorrhagic fever, Covid-19, Ebola, Avian influenza etc. **(See Annex 5A),** a list of PPEs, where required a full PPE is used.

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

Annex 4D: How to conduct a register review

1. Background

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

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

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

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

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

Procedure for conducting records review

a) Explain to the health facility's senior staff the purpose of the review. The information will assist the sub-county and health facility in determining the most appropriate action for limiting the outbreak and preventing future cases from occurring. Emphasize that the activity is an information-gathering exercise and is not a review of health worker performance.
b) Arrange to conduct the review.
c) Arrange a time to conduct the review when staff who will assist with the review are present and available to help or to answer questions.
d) Identify sources of information.
e) During the visit, depending on the priority disease or condition or events being investigated, check inpatient registers for the pediatric and infectious disease wards. The inpatient register for the pediatric ward is a good source because it lists all children admitted to the ward. Annual summary reports are not always accurate, and outpatient registers often include only a provisional diagnosis.
f) Review the system and procedures health workers use to record information in the registers about diagnoses. Make sure that the information needed for investigating any suspected case is available. At a minimum, the register should include:
g) the patient's name and location
h) the signs and symptoms
i) date of onset of symptoms and outcome (for example, date of death, if relevant)
j) immunization status, if appropriate to this disease.
k) If the health facility does not keep at least the minimum information, talk with senior staff about how to strengthen the record keeping so that the minimum information is collected.

l) Conduct the record review at the scheduled date and time.
m) Go to the selected wards as scheduled. During the visit, look in the health facility registers for cases and deaths that may be suspected cases of a priority disease. These should be cases or deaths that meet the standard case definition for suspected cases. Find out whether the suspected case was investigated and reported according to the national guidelines.
n) Line-list the suspected cases that are found.
o) Record information about the suspected cases. This information will be used during case investigation activities.
p) Provide feedback to the health facility staff.
q) Meet with the health facility supervisor and discuss the findings of the activity. Use the opportunity to review any features of case management for the illness that may help health workers in the facility. Reinforce the importance of immediate reporting and case investigation as tools for prevention of priority diseases and conditions. Use opportunity to emphasize on the need for IPC and minimum PPE
r) Report any suspected cases to the next level.
s) 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: Line List MOH 503 (Expanded)

No	Name of Patient	Sub-county or County	Ward	Locality	Age	Sex M/F	Occupation	Date of Onset	Date seen at HF	Diarrhea 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																				

Figure 23: *Line List MOH 503 (Expanded)*

Annex 4F: Contacts Listing Form

Contact's1 Recording Sheet filled in by……

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

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

Sub-county/Town…… County…….

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

Surname	Other Name	Relationship with the case	Health worker (Y/N), if yes which facility ?	Age (yrs)	Sex (M/F)	Phone number	Head of Household	Village/ neighborhood	Chief or Community leader	Sub-county/Town	Type of Contact (1, 2 or 3, list all)	Date of last contact	Last date for follow-up	1st	Outcome

Figure 24: *Contacts Listing Form*

Contacts are defined as:

1 - sleeping in the same household with a suspected case

- direct physical contacts with the case (dead or alive)

- has touched his / her linens or body fluids

– has eaten or touched a sick or dead animal

Annex 4G: Contact follow up form.

Contact Tracing Form – by Village Team Volunteer's name

Village Chief or Community leader

Sub-county/Town Province/Region .....

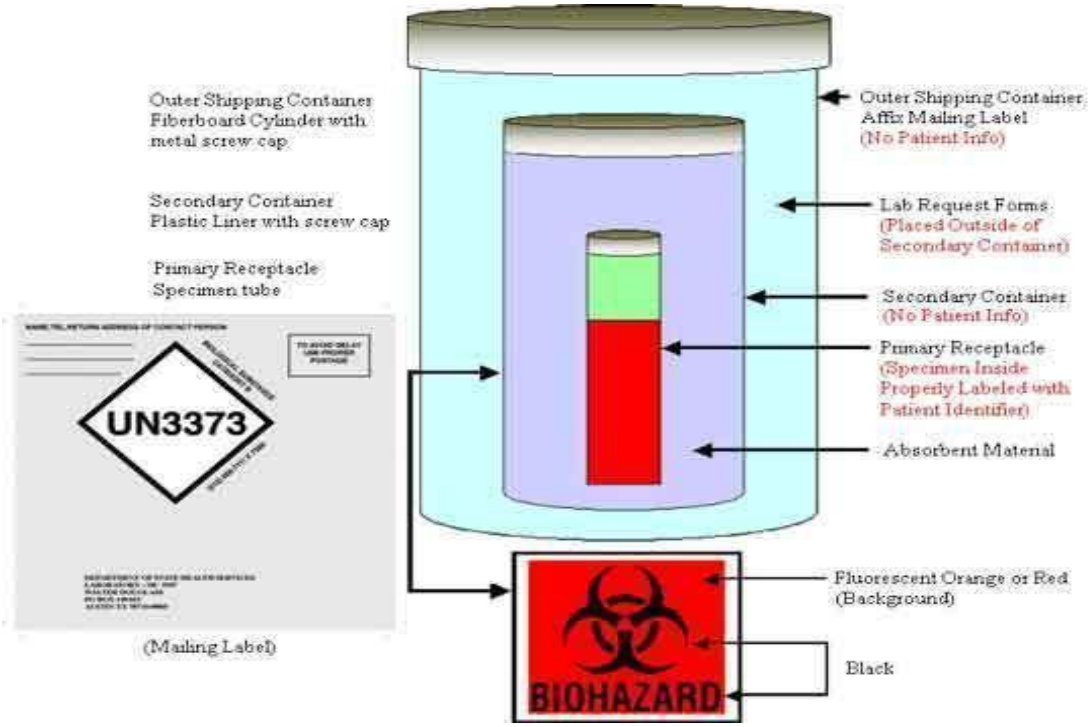
CN	Family Name	First Name	Age	Sex	Date of last Contact	**Day of Follow-up**																				
						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Record “O” if the contact has not developed fever or bleeding

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

Figure 25*:Contact follow up form.*

Annex 4H: Types of Triple Packaging of samples during an Outbreak



Source: https://medicine-science-and-more.com

Figure 26: *Types of Triple Packaging of samples during an Outbreak*

Annex 4I: An example on how to create a transmission tree

Consider the following scenario which describes an outbreak of a respiratory illness, where the investigation team had information on 13 cases.

The first case was a 25-year-old university student with onset of symptoms on 21 March 2012. He was admitted to Mbagathi 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 Kenyatta National Hospital (KNH) 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 (SARS).

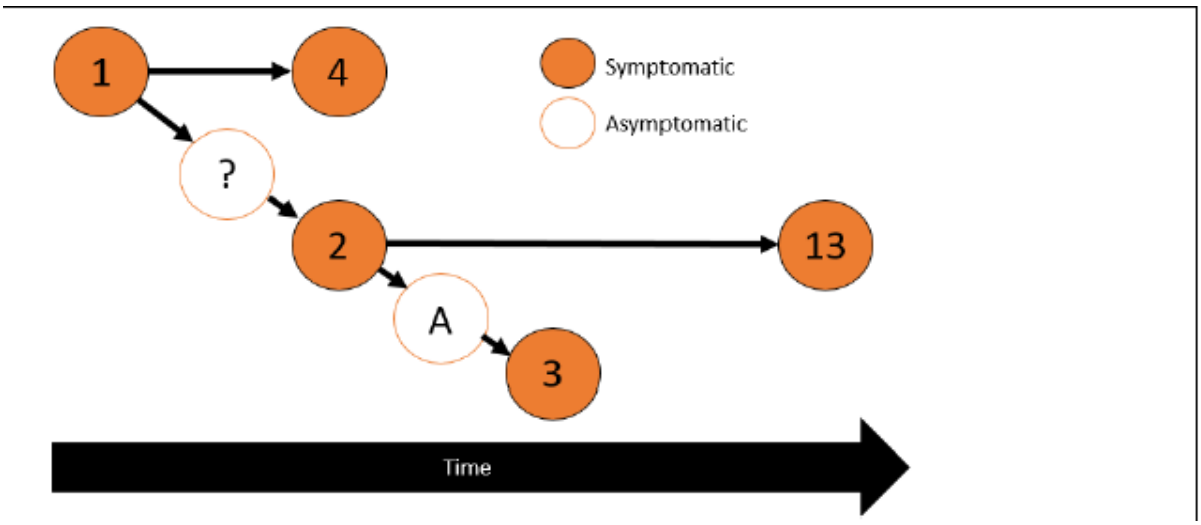
The second case was a 30-year-old male nurse in the CCU at Mbagathi hospital. His symptoms started about 29 March 2012. He did not travel or have contact with animals in the 10 days prior to his illness, though he was in close proximity to the first case in the CCU. On 8 April, case 2 was admitted to the CCU at Mbagathi with shortness of breath and pneumonia and was later discharged with no sequelae from Mama Lucy Kibaki 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).

Case 3 was a 40-year-old female nurse in the ICU at Mbagathi hospital whose illness was laboratory-confirmed after her death. Her symptoms began on 2 April 2012, and she was admitted to Mbagathi hospital ICU after developing pneumonia 7 days later. She was later transferred to ICU at Mama Lucy Kibaki 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.

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.

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.

Basing on this information, and a line list, one can sketch a transmission tree as follows:



Footnote: Extract from "Applied Public Health Case Study Scenarios for Training Public Health Professionals. Case studies developed under CDC/AFENET agreement". Transforming Public Health Surveillance. Location: Elsevier

(Note: The scenario has been localized)

Figure 27: *An example on how to create a transmission tree*

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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES FOR KENYA

THIRD EDITION



SECTION 5: PREPARE TO RESPOND TO OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

May 2022

SECTION 5: PREPARE TO RESPOND TO OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

5.0 Prepare to respond to outbreaks and other public health events

Rapid and effective response to a public health emergency such as a suspected outbreak or other public health event not only calls for an immediate response but is also one of the core capacities required by the Public Health Emergency Management Committee (PHEMC) in support of the Universal Health Coverage, Vision 2030 and International Health Regulations (IHR 2005). Being prepared to detect and respond to such an event is an essential role of the Community, health facility, Sub-County, County and National levels.

Preparations for public health events include:

Establishment of a National Task Force at the National, PHEMC at County and sub-county levels and functional Public Health Emergency Operation Centers (PHEOC), that will coordinate response to public health emergencies or events/incidents at these levels.

- Development of policies that would ensure planning, procedures for operation, mapping available resources, estimating required supplies and procuring them and conduct simulation exercises to test systems.
- Identifying and training key members of the NTF, PHEMC Subcommittees and the Rapid Response Teams (RRT)
- In addition, having an Emergency Response Plan (ERP) is crucial. The ERP 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 ERP 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 center, outlining standard operating procedures of how each functional area operates and works together; and the ISP is a plan developed to address high priority emergency/ event based on risk analysis and is always annexed to the ERP plan.

5.1 Public Health Emergency Operations Center

Establish a permanent Public Health Emergency Operations Center (command and control center) for overseeing public health emergency preparedness and response activities

The International Health Regulations (IHR 2005) require that State Parties develop, strengthen and maintain their capacity to respond promptly and effectively to public health risks and public health emergencies. Response to Public Health events is successful if there is more coherent, effective and efficient coordination of various actors representing a multi-sectoral team in the context of

one health approach. This will also ultimately result in minimizing the impact of the event in the community.

Kenya has one functional national PHEOC and other PHEOCs in the counties at different levels of functionality. These centers act as command-and-control centers to enhance coordination of public health emergency preparedness and response activities.

The national PHEOC is currently anchored at the Division of Disease Surveillance and Response (DDSR). The PHEOC strengthens the response function of IDSR. These PHEOCs link with EOCs in other sectors including; National Disaster Operation Center (NDOC), Kenya Red Cross Society (KRCS) among others

For the National PHEOC to function effectively the MOH should develop legislation to mandate and support PHEOC operationalization. This mandate will then outline the ministry roles and responsibilities, lay out the coordination mechanisms with overall national disaster management resources, and a funding mechanism to enable the operations of the PHEOC.

The PHEOCs at all levels will need to develop and operationalize the following essential elements so as to be fully functional to support the preparation and response to emergencies:

a) Plans and procedures for operations telecommunication technology and infrastructure to enable timely communication information system to support informed decision-making and deployment of trained human resource.
b) The PHEOC will monitor events using various sources of data; facilitate and improve communication between public health and emergency management personnel, and facilitate coordination with multiple response partners. The PHEOC should feed into the National Disaster Operations Center (NDOC) to manage disasters, as outlined in the National Emergency Response Framework
c) During public health emergencies, the PHEOC, which is the command control center guided by the NTF. The NTF is technical advisory team appointed by the DG. The PHEOC uses the Incident Management System (IMS), which is a standardized approach used to manage and coordinate the response by providing a common hierarchy for response by staff.
d) 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 can also be scaled up, which is essential for maintaining the effectiveness of a PHEOC and it can be partially or fully activated according to situational needs. (Please refer to Kenyan Framework for a Public Health Emergency Operations Center)

e) IMS should be functional at all levels of the health system coordination. (National, County and Sub- County). It is important that once the IMS is activated during public health emergencies, the NTF meet at least once a week to facilitate coordination, communication and information sharing. In addition, the IMS should put in place containment measures and at the same time facilitate the deployment of the Rapid Response Team (RRT). During activation, the PHEOC will also help in the flow of information horizontally and vertically to the respective departments, relevant sectors and partners for seamless operations.

f) Having a center for command and control is essential for preparedness and response to public health events. Counties and sub-counties will need to have PHEOCs, with basic facilities that support direct coordination of preparedness and response to public health emergencies and facilitate real-time communication and information sharing between various stakeholders at their levels, but also ensuring there is a mechanism of sharing information with the national level PHEOC. Similar structures for PHEOC and NDOC shall be established at the county and sub county level.

g) When inactive, the PHEOC, usually reduces in size and the respective members under the various NTF sub-committees return to respective working stations. The strategic staff at the center will liaise with respective sections or departments to continue with maintaining plans and procedures. Other priority activities will include, conducting training and simulation exercises, routine and event-based surveillance activities, maintaining systematic databases of the resources available, important phone numbers, names and addresses of important government and non-government officials, international bodies and NGOs.

5.2 Establish the National Task Force (NTF) and the County, Sub-County Public Health Emergency Management Committee (PHEMC)

Public health emergency management committee (PHEMC) should be established at all county and sub county levels; and the NTF at the National level. The PHEMC and NTF across all levels should work closely with their counterparts to plan and monitor the implementation of public health emergency plans. These are the coordinating committees in their respective levels and are composed of technical and non-technical members from health and other sectors. The role of the PHEMC and NTF is to develop and oversee the implementation of emergency preparedness strategies, action plans, and procedures. The NTF will be chaired by the Director-General for Health or Director of Veterinary Services depending on the nature of emergency or level of cross-species involvement.

5.2.1 Identify functions of the National Task Force/PHEMC

- To update the Director General for Health on the response to a public health emergency
- To advise on involvement of multi-sectoral approach
- To guide the incident management team on response strategies
- To review the national emergency preparedness and response plans

5.2.2 Functions of the incident management team at the National, county and sub-county levels

- Ensure coordination and integration of surveillance and response activities across all levels
- Develop a national emergency preparedness plan for all potential emergencies including disease outbreaks and other public health events at sub-county, County and/or national level
- Develop a comprehensive response plan to manage all emergencies and clearly define surge capacity response at sub-county, County and/or national level
- Map available human and material resources, logistics, finances etc.
- Coordinate training of personnel at the national level in emergency preparedness and response.
- Periodically review and update the plan based on epidemiological, technological or managerial changes or any other risk identified.
- Liaise with other sector incident management teams, the National Disaster Management Unit (NDMU) to ensure a multi-agency approach.
- Establish a community communications plan for sharing information with communities before, during, and after any public health emergency. The plan should include mapping of all communication channels: community radio, data on cellular and internet penetration, NGO/FBO/CBO networks, prearranged agreements with cellular companies, other platforms (schools, women groups, religious gatherings, 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 sub-county 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 use of the resources before, during and after the emergency.
- Ensure emergency stockpiles within the sub-county, county, national and strategic sites are, procured, monitored and updated regularly.
- Enhance linkages with Community Based and primary health facility focal persons to ensure flow of data for early detection of public health events.
- Coordinate training of personnel at the community, health facility, sub-county and county levels in emergency preparedness and response.
- Ensure that there are periodic emergency response simulation exercises at the County, sub-county, health facility and community levels.
- Coordinate the post-emergency evaluation and plan to disseminate findings to the affected communities.
- Ensure provision of efficient administrative and financial management support including
- human resource;

- cash flow by estimating, tracking and approving response-related expenditure; monitors and coordinates funding from all sources
- Ensure the facility information and communication technology has capacity to support any emergency
- During public health emergencies, the PHEMC at county level and the NTF at National level, will oversee the activation of the IMS. including activation of the IMS structure and formation sub-committees and the deployment of the Rapid Response teams.
- During non-public health emergency periods, regular meetings should be held to strengthen preparedness capacity (e.g., training health care workers (HCWs)

5.2.3 Identify members of the Public Health Emergency Management Committees (PHEMC)/NTF

Organize the NTF and PHEMC to include representatives from the public, non-governmental organizations (NGO) and private sectors to match the functions listed above. At the sub-county level PHEMC, participants from the public sector may include:

- Sub-county administrator
- Deputy county commissioner
- National Police Service/Military Representative
- Sub-county medical officer of Health
- Medical superintendents/ Chief Executive Officer (CEO)-in charge of hospitals
- Sub-county director of Veterinary/Agricultural services
- Sub-county public health nurse
- Sub-county disease surveillance coordinator (SCDSC)
- Sub-county pharmacist
- Sub-county public health officer
- Sub-county director of education
- Sub-county water officer
- Sub-county public works officer
- Kenya Wildlife service officer
- National Environment Management Authority representatives
- Natural resources experts
- Laboratory technologist from the sub-county laboratory, both human and animal
- Sub-county community development officer
- Immigration officer where applicable
- Health promotion Officer
- Researcher in biomedical and analytical chemistry
- M&E officer
- Sub County Health records and Information Officer
- Legal officer
- Social development officer

- Influential leaders/Gate keepers e.g., Member of Parliaments, Members of county assembly, religious leader, Clan leaders, etc.

Note: At County level and National levels, an equivalent of the above should be used in order to ensure a more comprehensive multi-sectoral structure. Consider at National level, to include directors from other key relevant ministries, heads of agencies, National Health Research Institutions (Human and Animal). The members from the IHR National Focal Point should always be part of the National Team Composition.

From civil society organizations with health care activities in the area, include representatives from:

- Community health programs and faith-based health facilities
- Red Cross, Red Crescent or similar agencies working in the area
- Local NGOs
- Civil society organizations
- UN organizations
- From the private sector, involve participation from:
- A representative from private health facilities
- A representative from private laboratories
- Pharmacists or chemists
- Representatives of business community
- Research and training institutions
- Professional associations

Note: The PHEMC at the county level will be co-chaired by the county secretary or the county commissioner. County Director Health or County Director of Veterinary Services will form the secretariat. At the sub-county level, the PHEMC should be co-chaired by the Deputy County Commissioner or the Sub-County Administrator. The Sub-County MOH/equivalent or the sub county Director of Veterinary Services will form the secretariat. The Secretariat should convene the meetings in consultation with the chairs

5..2.4 National Task Force/Public Health Emergency Management Committee (PHEMC) meetings

When there is no outbreak or any other public health event, the NTF/PHEMC should meet on a quarterly basis, in order to:

- Regularly review the Emergency Preparedness Plan
- Exchange information on risk monitoring. It should be emphasized that other relevant health sectors can equally benefit from information provided by the human health sector and vice versa. In some events, human cases can be the first indication of a threat to other sectors. For example, animal health services will be impacted by cases of Crimean- Congo hemorrhagic fever, as cases in humans constitute the primary indicator for viral circulation

in animals as infection is asymptomatic in livestock, as such intervention must be done in this sector. For instance, vaccination among livestock might be crucial if detection of human cases of anthrax or rift valley fever have initially occurred 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 Emergency Response Plans

Note: It should be noted that the PHEOC (Command and Control center) will serve as a hub for coordinating these activities.

During an emergency or outbreak response, the NTF/PHEMC should:

- Meet as soon as the outbreak or event is established by the Director General for Health.
- Conduct situational analysis and grade the level of the event

At National Level, activate the PHEOC (Command and Control center) and EOCs at subnational levels

- Activate the NTF/Public Health Emergency Management Subcommittees **(See 5.3)**
- Deploy RRT to the field to investigate and respond to the event.
- Regularly communicate to the public on the outbreak as guided by Director General Health
- Assess the need for, and request support from higher levels when needed.
- Meet at least daily at the beginning of the outbreak or event and thereafter determine the frequency based on the need and during
- Maintain regular monitoring of outbreak response and take action as necessary.
- Document and communicate outbreak response actions to next higher level to ensure effective control management; e.g., maintaining logistics
- Conduct an after-action review

5.3 Establish NTF and Public Health Emergency Management Subcommittees at all levels

The Sub-committees are formed by the NTF/PHEMC to undertake the management of public health emergencies.

They consist of technical and non-technical teams depending on their functions. See table 15 below:

Table 15: *Functions of NTF/Public Health Emergency Management Subcommittee*

The Principal Secretary is the chair of the National Task Force (NTF) that consist of the following sub committees;

Sub committee	**Members (Experts, Organizations)**	**tasks**
Coordination/Management sub- committee .	Overall Chair EPR (Incident Manager):	Coordinate all aspects of the operations response, planning and management including: Selecting participating organizations and assigning responsibilities Designing, implementing and evaluating control interventions Co-ordination of technical EPR subcommittees and overall liaison with partners Daily communication through situation reports about the evolution of the outbreak Managing information for public and news media Operational support including mobilization of resources Responsible for staff wellbeing, security
Finance and Administration	Chair: Chief Finance Officer (CFO) National level, Chief officer of Health (COH) at County level, **Members:**	Tracks expenditure, makes payments, and provides administrative services Ensures appropriate cash flow management,

	The composition may include experienced Health Administrators, Finance/Accounts Officers, Budget Officers and Logisticians. Technical Staff, Sub-County Medical Officer of Health or Medical Officer in Charge, Laboratorians	tracking material and human resources, looking at cost, budget preparation, monitoring, and maintenance of administrative records.
Logistics	Chair: Pharmacist/ Logistics Officer Members: Supplies/ Stores assistants Laboratory Technologist Clinician Public health Nurse Pharmacists or dispensers Health Administrative officers Technical assistance from the Ministry of Health or Ministry of Agriculture and Livestock Partners supporting logistics management	Provide budgetary support/funding for epidemic preparedness & response Procurement of equipment and supplies Maintain adequate stocks of supplies and equipment Arrange for transport and communication systems Liaison with other agencies for logistic support Provide accountability for all the resources used during epidemic preparedness & response
Planning	Chair: An appointed Government official in the rank of Planning Officer or similar posts) Members: Chairs of all the subcommittee Appointed members from EPR committee	Evaluate the situation (information gathering and analysis), assessment of the options for dealing with it, and keeping track of resources.

Table 16: *Technical Operations Subcommittees: Chaired by Operations Lead (Coordinates all the activities of the emergency response team*

Sub-committee	**Members (Experts, Organizations)**	**tasks**
Case management and infection prevention & control	Chair: A clinician from Ministry of Health, or the sub-county, County or referral hospital Example of members at the sub-county level: Sub-county security team Sub-county MOH Medical superintendents-in charge of hospitals Sub-county director of Veterinary/Agricultural services or equivalent Sub-county public health nurse Sub-county disease surveillance coordinator Sub-county public health officer or equivalent Sub-county director education officer Sub-county water officer Sub-county public works officer Kenya Wildlife Service representative Research Institute Human/animal Representative from environmental sector Laboratory technologist from the sub-county laboratory, both human and animal	Ensure or make available guidelines and SOPs for case management and infection prevention and control in all health facilities Strengthen isolation facilities and reinforce infection prevention and control measures Conduct risk assessment for health care workers Ensure appropriate medical care is being provided to patients Ensure laboratory monitoring of cases Provide ambulance services – collection of suspected cases from the community using the defined referral system Collect data from all treatment facilities (if available) and submit to the surveillance sub-committee Ensure appropriate disinfection of homes and environments with suspected/ probable/ confirmed cases/ deaths of an infectious disease Conduct safe burial of dead bodies from isolation facilities and community deaths Training and refreshers training of health workers in the isolation facility and other health facilities in the affected sub-county

	Sub-county community development officer Customs Immigration officer From non-governmental organizations with health care activities in the area, include representatives from: Community health programs and faith-based health facilities Red Cross, Red Crescent or similar agencies working in the area Local NGOs Civil society organizations From the private sector, involve participation from: A representative from private health facilities A representative from private laboratories Pharmacists or chemists Representatives of business community Research and training institutions Professional associations	
Surveillance and Laboratory	Chair: Surveillance Coordinator or Epidemiologist (National/County/Sub-County levels) Example of members at the sub-county level:	Ensure or make available all surveillance guidelines and tools in the health facilities Ensure the use of the outbreak case definition

	Sub-county security team Sub-county medical officer of health/equivalent Medical superintendents-in charge of hospitals Sub-county director of Veterinary/Agricultural services or equivalent Sub-county public health nurse Sub-county disease control officer or equivalent Sub-county environmental health officer or equivalent Sub-county director of education officer Sub-county water officer Sub-county engineer Kenya Wildlife Service representative Representative from environmental services and veterinary experts Laboratory technologist from the sub-county laboratory, both human and animal Sub-county community development officer Sub county Health Records and information officer Immigration officer Counsellors Administrative/county assembly Port Health officer	Conduct active case finding, case investigation, contact tracing and follow-up Verification of suspected cases/ alerts/ rumors in the community Ensure proper filling of case investigation, contact tracing and follow-up forms Ensure proper collection, packaging, transport, and testing of specimens from suspect/ probable cases/ deaths Communicate test results to clinical services Conduct data management and provide regular epidemiological analysis and reports Training of health personnel in disease surveillance Close linkage with burial, infection control and social mobilization groups.

	From non-governmental organizations with health care activities in the area, include representatives from: Community health programs and faith-based health facilities Red Cross, Red Crescent or similar agencies working in the area Local NGOs Civil society organizations From the private sector, involve participation from: A representative from private health facilities A representative from private laboratories Pharmacists or chemists Representatives of business community Research and training institutions Professional associations	
Risk Communication and Social Mobilization	Chair: Health promotion officer Example of members at the sub-county level: Sub-county security team Sub-county medical officer of Health/alternative Medical superintendents-in charge of hospitals Sub-county director of Veterinary/Agricultural services or equivalent	Ensure or make available risk communications materials and plans Conduct rapid assessment to establish community knowledge, attitudes, practices and behavior on prevailing public health risks/events Organize sensitization and mobilization of the communities Serve as focal point for information to be released to the press and public Liaise with the different subcommittees, local leadership and NGOs involved in activities on mobilizing communities

	Sub-county public health nurse Sub-county disease control officer or equivalent Sub-county environmental health officer or equivalent Sub-county education officer Sub-county water officer Sub-county engineer Wildlife officer Natural resources and veterinary experts Laboratory technician or laboratory technologist from the sub-county laboratory, both human and animal Sub-county community development officer Immigration officer From non-governmental organizations with health care activities in the area, include representatives from: Community health programs and faith-based health facilities Red Cross, Red Crescent or similar agencies working in the area Local NGOs Civil society organizations From the private sector, involve participation from: A representative from private health facilities A representative from private laboratories	

	Pharmacists or chemists Representatives of business community Research and training institutions Professional associations	
Psychosocial support	Chair: Psychosocial Coordinator Members (National/County/ Sub-County 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 wellness care and psychological support to the response team Prepare bereaved families/ communities for burials Prepare communities for reintegration of convalescent cases/ patients who have recovered
Water, Sanitation and Hygiene (WASH)	Chair: Public Health Officer or Ministry of water (National/County/Sub-County levels): Members: Public Health Officer Ministry of Public Work Partners supporting WASH e.g., UNICEF	Conduct environmental health risk assessment for the outbreak Ensure provision of clean water 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.
Vaccination campaign	Chair: Head National Vaccines and Immunization Program/ EPI logisticians/SCPHN, (National/County /Sub-County levels):	Identify high risk groups during the outbreak that should be targeted for vaccination Compute the targeted population for the vaccination campaign

	EPI nurse Health Records and Information Officer Public Health Officer Clinician in charge Nurse in charge at county/sub county Health Promotion officer Partners supporting vaccination e.g., WHO, UNICEF Community leaders Technical assistance from the Ministry of Health (National Logistician)	Conduct micro-planning for all vaccination logistics including cold chain facilities, vaccine delivery and distribution, human resource needs, waste handling, social mob. Conduct the vaccination campaign and post vaccination campaign validation exercise

5.4 Establish Rapid Response Teams at all levels

A Rapid Response Team (RRT) is a technical, multi-disciplinary team that is readily available for quick mobilization and deployment in case of emergencies to effectively investigate and respond to emergencies and public health events that present significant harm to humans, animals and the environment irrespective of origin or source. RRT should be established at the sub-county, County, and national levels.

Refer to **Section 4.2** on the composition of the RRT.

Roles and responsibilities of the national, County and sub-county RRT

The RRT is expected to:

a) Investigate rumors and reported outbreaks, verify diagnosis and other public health emergencies including laboratory testing
b) Collect samples from new patients and old ones if necessary (human, animals, food, and water)
c) Make a follow up by visiting and interviewing exposed individuals, establish a case definition and work with community to find additional cases
d) Assist in laying out mechanisms for implementation of Infection Preventive Control Measures
e) Assist in generating a line list of the cases, and perform descriptive analysis of data (Person, Place and Time) to generate hypothesis including planning for a further analytical study
f) Propose appropriate strategies and control measures including risk communications activities
g) Establish appropriate and coordinated risk communication system
h) Coordinate rapid response actions with national and local authorities, partners and other agencies.
i) Initiate the implementation of the proposed control measures including capacity building
j) Conduct ongoing monitoring and evaluation of effectiveness of control measures through continuous epidemiological analysis of the event
k) Conduct Risk Assessments to determine if the outbreak is a potential PHEIC
l) Prepare daily updates and detailed investigation reports to share with NTF and PHEMC
m) Contribute to ongoing preparedness assessments and the final evaluation of any outbreak response.
n) Meet daily during outbreaks, and quarterly when there is no outbreak
o) Participate in simulation exercises

5.5 Risk mapping for outbreaks and other public health events

Vulnerability, risk assessment and mapping are 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 (in the catchment area) with the potential to affect community health. This mapping must address all acute health risks, and not be restricted to communicable diseases. The exercise should consider the identification and mapping across all levels from county to sub-county. For example, include evaluation of drinking water sources or food storage methods, animal breeding areas and movements.

This process should be ongoing and updated periodically. For example, once a year, assess those risks and record the information on a map. This is useful information when considering supplies, transport and other resource issues necessary for the response.

Kenya will assess and prioritize risks using WHO Tool and this includes including the health consequences of natural or human-induced emergencies, the health events covered under IHR (zoonosis, chemical, radio-nuclear, food safety) and also events occurring in neighboring countries or regions. The tool will assist the sub-county or County or national level to develop priorities for the development of contingency plans and specific responses, and also can be used to outline the potential needs to enhance national capacity in terms of preparedness and response (Strategic Tool for Addressing Risk, STAR, WHO, DRAFT Version 3.3.1 (2017/07/27). Kenya will use the 2008 Tripartite "Zoonotic Diseases: A Guide to Establishing Collaboration between Animal and Human Health Sectors at the Country Level".

5.6 Resource Mapping

In preparing for outbreaks, there is the need to undertake resource mapping to identify the available resources in every geographical area. This ensures 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 sub-county or the county or development partners and NGO available in respective levels

5.7 Prepare an emergency preparedness and response plan

There should be all hazard plans developed for preparedness and response for national, county and sub-county levels. The plans at all levels should be in line with the overarching national preparedness and response plan for 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 to subnational levels to respond promptly when an outbreak or other public health event is detected.

This plan should:

- Be based on risk assessments done in a multi-sectoral approach, and should specify the resources available for emergency preparedness and response.
- Take into consideration diseases with epidemic potential in the County, sub-county, and neighboring countries.
- Take into account all other events (All hazard approach) and cover the IHR core capacity requirements of **ANNEX 1A**. Core capacity requirement for surveillance and response (IHR 2005, Third edition)
- Take into account Point of Entry activities for strengthening surveillance and response
- Layout concept of operations including clear lines of accountability, decision making authorities and processes, procedures for activation /deactivation, call for assistance etc.
- Describe the surge capacity to respond to public health emergencies of national, County, and sub-county concern
- Provide estimates of the population at-risk for epidemic-prone diseases and other public health emergencies.
- Clearly indicate for each suspected outbreak which reference laboratory will be used for confirmation.
- Provide estimates of 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 Rapid Response Teams
- Describe the procedures, plans to relocate or mobilize resources to support response
- Describe 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 preventive interventions based on risk analysis and mapping.

Elements of Emergency Preparedness and Response Plan

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

1. Designated coordination structures, including committees
2. Matrix of key stakeholders and partners supporting health activities [humans, animals (domestic, livestock and wildlife), environment, etc.) and roles and responsibilities
3. Epidemiology and surveillance activities, including health information management
4. Steps for carrying out a risk communication strategy including social 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 social mobilization
13. Capacity building including required training, sensitization meetings and simulation
14. logistics management plan including supply lists
15. Environment, water and sanitation
16. Decontamination of patients and environment, including management of dead bodies
17. Monitoring and evaluation of the outbreak or event
18. Resource mobilization and procedures to relocate or mobilize resources to support response

5.7.1 Set up contingency stocks of medicines, vaccines, reagents and supplies

Outbreaks and other public health emergencies require the rapid mobilization of resources such as vaccines, medicines and lab supplies. It is prudent to map out resources available so as to get the status of the stockpile with respect to pharmaceuticals, non-pharmaceuticals, Personal Protective

Equipment (PPE) and other equipment to establish and preposition stockpiles of materials before an emergency occurs. While doing the mapping at national level for stockpiling, it is also important to know the County 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 sub-counties, to county to national level should set up a contingency stock of medicines, vaccines, reagents and supplies to permit prompt management of the first cases without delay. At subnational level, this is critical before support arrives from higher levels. Ensure that there are also quick mechanisms of sending supplies from the national level. Regularly monitor the contingency stock in order to avoid shortages and expiry of medicines, vaccines, reagents and supplies. Examples of stock management tools are included in the annexes 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 sub-county. Risk assessment activities help to develop a list of minimum materials that should be stockpiled at the sub-county and community levels. If not all sub-counties and community level can be stockpiled with minimum materials and ensure a designated point (health center, sub-county) is identified to ensure quick release of these items when needed during an outbreak.

Partnerships with other implementing agencies, e.g., NGOs, concerning stockpiles of appropriate medicines, vaccines and other materials should be established in advance, at all levels (National, County, and Sub- County)

Refer to **Annex 5A** at the end of this section.

5.7.2 Conduct stock management for outbreak response

Maintain and preposition 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.

Refer to Annex 5B (inventory checklist)

Periodically, like quarterly, ensure the supplies are dry, clean, not expired, not deteriorated and ready to be used and that an effective and efficient web-based mechanism to assess their status is in place.

The following tasks are 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 the following:
    - Availability of case definition posters; registers including line list register; as well as required reporting Forms/referral forms.
    - Availability of laboratory reagents and supplies and diagnostic reagents and kits

- Specimen collection, storage and transport kits including Triple Package containers,
- Availability of various guidelines for surveillance and response of specific diseases including laboratory SOPs
- 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. **Ref: Annex 5C**

5.7.3 Update human resource available for response as well as other logistics support for response of public health events at all levels

- Update yearly list of all surveillance focal persons from all reporting sites including community level
- Update roster of rapid response teams at all levels
- Update other logistics like vehicles, fuel, phone cards etc.
- Update list of trained health staff including laboratory staff
- Map laboratories that have sufficient quality control standards and meet the required standards to ensure reliable results, including availability of SOP which defines biosafety procedures for collecting, packaging, labelling, shipping, manipulating and discarding samples.
- Map also the specimen referral/transportation network including schedules, and if not, create the mechanism to ensure prompt referral of specimen is done 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 risk communication SOPs at the different levels

Annexes to Section 5

Annex 5A: Essential stock items for responding to outbreaks

Annex 5B: Stock situation report

Annex 5C: IDSR stock item transaction and balance sheet

Annex 5D: Assignments for the committee to develop the Epidemic Preparedness and Response plan

Annex 5A: Essential stock items for responding to outbreaks

Essential Stock items for Responding to Outbreaks				
Medicines	Disinfectants, Insecticides and Rodenticides	Supplies	Vaccines	Equipment
Ceftriaxone	Disinfectants	Auto-disable syringes	Meningitis vaccines AC, ACW135/ A, C, Y, W135, Meningococcal Conjugate Vaccine (MACV), Meningitis vaccines Conjugated	PPE
			Cholera vaccines	Body Bags
Ciprofloxacin	2% Chlorine		Tetanus antitoxin	Buckets
Diazepam	Bleach	Bed nets	Yellow fever vaccines	Camping kits
Doxycycline	Calcium hypochlorite	Personal Protective Equipment (see Annex 4C)	Rabies vaccine and immunoglobulin	Candles
Medicines for supportive care	Cresol	Laboratory supplies (see Annex 4B)	Other vaccines e.g., Flu vaccine	Computer
Erythromycin	Sodium hypochlorite			Containers
	Pesticides	Nasogastric tubes 2.7 mm OD, 38 cm		Cook-ware
	Cypermethrin	Nasogastric tubes 5.3 mm OD, 50 cm		Diesel
Oral rehydration salts	Malathion	Needles and syringes		Front lamp

Paracetamol	Permethrin	Intravenous giving sets different sizes)		GPS Receiver
Penicillin V	Rodenticides	Spoons		Kerosene lamp
Rehydration fluids:	Brodifacom	Sprayers (pump and fogger)		Lab: see annex 4b
Ribavirin	Bromadione			Lamps
Ringer lactate				Maps
Oseltamivir				Paraffin
				Phones
				Plastic sheets
				Power generator
				Radio
				Sprayers

Note: Detailed list also available in **Annex 4B**

Annex 5B: Stock situation report

Surveillance and Emergency Preparedness and Response: Stock Situation Report
Year:
Report day (day/mm/yyyy): Reporting period: _____
Reporting site name:
Sub-county: __ Country:

Item Description	**Opening Stock**	**Quantity received**	**Total Stock**	**Quantity issued**	**Stock Balance**	**Observations, decisions and recommendations**

Title, Name and function of Responsible Officer:

Figure 28: *Stock situation report*

Annex 5C: IDSR stock item transaction and balance sheet

IDSR Stock Item Transaction and Balance Sheet																	
Laboratory or Item	Description (Name)	Presentation (Unit	Expiry date	Manufacturer	Batch number	Location in store	Airway bill	Allotment	Shipment & operations cost	Date Transaction	Quantity	Donor or Supplier	Quantity issued	Destination or Beneficiary	Stock Balance	Signature (Name and	Observations/ Remarks
																	Inventory
Use one sheet by stock item, and update the sheet every time any transaction takes place																	

Figure 29: *IDSR stock item transaction and balance sheet*

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 roles and responsibilities	
Epidemiology and surveillance activities, including health information management	
Define roles and responsibilities of members during an outbreak	
Develop the risk mapping	
Steps for carrying out a risk communication strategy including social mobilization	
Operational actions according to expected phases of the epidemic	
Laboratory specimen collection, handling, transportation, processing and information management	
Case management, including treatments (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 social mobilization	
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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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES FOR KENYA

THIRD EDITION



SECTION 6: RESPOND TO OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

May 2022

SECTION 6: RESPONSE TO OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

6.0 Overview on how to respond to outbreaks and other public health events

The goal of an integrated disease surveillance and response is to use data for public health response or action. This section describes steps for declaring an outbreak and activating the response structures, conducting a public health response and provide general directions for immediate response actions for leading causes of illness, death and disability. It also references from relevant WHO guidelines which are at the end of this section, for responding to chemical, biological, radio-nuclear and other Public Health events.

When an outbreak, acute public health event or condition is detected, an investigation should take place to determine the cause of the outbreak as described in **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 a vaccine-preventable disease, strengthening nutritional support and feeding practices for children with malnutrition, or administering anti-malarial, antibiotic or antiviral treatments as indicated. Successful responses are carried out with community involvement and often include community education and behavior change component.

Effective coordination of response activities is also critical, as many actors/stakeholders will be involved. It is essential that all actors/stakeholders be identified in advance including their areas of support, roles and responsibilities to enable smooth response during an epidemic or any other public health event. This is the role of the NTF or PHEMC (which has been defined in section 5) (which through the activation of the IMS, they will ensure effective coordination of the response activities across different sectors and donors (as discussed in **Section 5**).

Regardless of the specific recommended response, the national, county or sub-county's role in selecting and implementing a recommended response is essential for safe-guarding the health and well-being of communities at the respective level.

Under the International Health Regulations IHR (2005), Counties are required to be involved in response to hazards such as infectious diseases, zoonosis, food safety, chemical, radio-nuclear and other unknown events if they are detected.

6.1 Declaring an outbreak and activating the response structures

Once an epidemic threshold is reached at County level, the Head of the Sub-County Health Management Team should notify the County and subsequently the National level (Department of Disease Surveillance and Response (DDSR). Depending on the event, at the national level, DDSR, and IHR National Focal Point (NFP) will assess whether the event is a potential Public Health Event of International Concern (PHEIC) using the International Health Regulations (IHR) decision instrument. DDSR/IHR NFP within the Ministry of Health, will notify the WHO/IHR AFRO Office. The Director General (DG) will then alert the neighboring counties about the outbreak/event, to enhance coordinated response efforts. While waiting for confirmation of

laboratory diagnosis there may be a declaration of a suspected outbreak by the Cabinet Secretary of Health or respective sector ministry which is affected.

6.2 Mobilize Rapid Response Teams (RRT) for immediate action

The Rapid Response Teams (RRT) would have already been identified during preparedness activities. The RRT will be activated depending on the outbreak/event being responded to. The RRT should reflect the technical needs of the response. Refer to **Section 5** of this guidelines for recommendations on the composition of the rapid response team and the team's roles and responsibilities.

6.2.1 Activate the County Public Health Emergency Management Committee (PHEMC)

Once an outbreak or event is confirmed, the Sub-County Medical Officer of Health and or Director Veterinary Services will work with the Sub-County Administrator and the Deputy County Commissioner to convene the PHEMC to assess and implement the response. They will also activate the IMS (Refer to **Section 5**). The following further steps should take place:

- Request outbreak or event response funds
- Alert neighboring sub-counties 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 neighboring country, then inform the neighboring County in the given country. If not, the IHR NFP must communicate with the neighboring NFP to notify them of the public health event. This will assist in coordination of response to a public health event and minimize spread of the disease beyond the catchment area.
- Assign clear responsibilities for specific response activities to lead the technical committee. They will also review if the IMS team is adequately composed i.e., has all the technical and non-technical members (See **Section 5**)
- Provide orientation or training along with adequate quantities supplies for the sub-county response team and affected health facility staff.
- Review existing resources as defined in the preparedness plan and determine what additional resources are required. For example:
- Human resources that could be mobilized to manage the epidemic
- Funds to support response activities
- Other logistic support e.g., vehicles and fuel, phones
- Request emergency stocks of Personal Protective Equipment (PPE), disinfection, and required pharmaceutical and non-pharmaceutical supplies such as specimen transport kits
- Provide laboratory or diagnostic support for confirmation of pathogens responsible for the epidemics. If the county. (The capacity to safely collect, package and ship the specimen should be developed). For laboratories where referral of specimen is a challenge, consider

using Rapid Diagnostic kits or any other Point of Care (PoC) Diagnostics if available until laboratory confirmation.

- Mobilize logistics support (travel of rapid response team, accommodation arrangement, communication, other essential equipment) to sub-county and community level
- If supplies are not available locally:
    - Contact the National level to request for supplies
    - Collaborate with other services, activities or non-governmental organizations or private pharmacies and laboratories in your area
    - Identify practical low-cost substitutes
    - Ensure clear lines of communication and appoint a spokesperson

6.3 Select and implement appropriate public health response activities

Review investigation results and data analysis interpretation provided by Rapid Response Team (RRT) to select 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 for:

- overall coordination,
- case management and Infection, Prevention and Control (IPC),
- logistics and supply chain management,
- laboratory confirmation,
- surveillance (case detection) and epidemiology,
- social mobilization and risk communication,
- Reactive vaccination,
- Water, Sanitation and Hygiene (WASH)
- Vector control

Refer to Section 11 and national disease specific guidelines to select response activities, which involve:

Proven measures to prevent unnecessary deaths or disabilities due to the specific cause of the disease or event.

A mix of activities for immediately controlling the disease or event in the short-term, and reducing the risk of ongoing transmission in the long-term through prevention activities.

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

Participation of other key actors/Stakeholders from private organizations, business entity association groups, traditional healers, food vendor associations and others who might influence the response activities

Implementing a response means carrying out the planned interventions as determined by the risk assessment. 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 availability of trained health staff.

The selected activities for responding to outbreaks or public health events include the following:

- Strengthen case management and infection prevention and control measures
- Build the capacity for response staff
- Enhance surveillance during the response
- Enhance surveillance in neighboring border County
- Engage Community during response
- Inform and educate the community
- Conduct a mass vaccination campaign
- Improve access to clean and safe water
- Ensure safe disposal of infectious waste
- Improve food handling practices
- Reduce exposures to infectious or environmental hazards
- Ensure safe and dignified burial and handling of dead bodies
- Ensure appropriate and adequate logistics and supplies

6.3.1 Strengthen case management and Infection Prevention and Control measures (IPC)

Strengthen clinical practices in case management and IPC at the County. Review the recommendations in **Annex 6A** and **Section 11.0** for treating cases of different diseases during an outbreak. Proposed activities to strengthen case management and IPC may include:

- Train and equip health workers at the county level
- Ensure that clinicians receive results of laboratory confirmation.
- Ensure health workers record all cases 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 Standard Operating Procedures (SOP) that includes IPC guidelines
- Implement IPC and risk mitigation measures, for example:
    - Establish triage and isolation wards for highly infectious diseases (E.g., Ebola, Cholera, SARS, etc.). See Annex 6H for cholera treatment center.
- Ensure health staff have access to safety and personal protective equipment for any infectious diseases (especially for Ebola and SARS).
- Ensure that there are safe practices and protection of non-health worker (supporting staff, e.g., security, cleaners, administrative staff)

- Ensure WASH standards for health facilities are implemented
- Provide oversight about disposal of PPE and other contaminated supplies.
- Ensure appropriate biosafety and biosecurity for animals (farms, markets, etc.)
- Ensure the necessary pharmaceutical and non-pharmaceutical supplies are available.
- Ensure that the proper treatment protocols are available
- Review the standard operating procedures for the referral system
- Ensure that a proper discharge protocol of cases linked to social support is available

6.3.2 Build the capacity for response staff

Provide relevant capacity building for response staff on; outbreak or event case definition, case management procedures, IPC, reporting process and required data elements. It is important that you ensure all the response teams are aware of and have access to the recommended appropriate PPE. If there are immunizations requirements for responding to the particular disease or condition, ensure that the response staff are protected with indicated immunizations.

Areas of focus for capacity building may include:

- Case management Guidelines
- Enhancing standard precautions measures for IPC (use of clean water, hand-washing, Isolation, Disinfecting surfaces and safe disposal of sharps)
- Proper use of personal protective equipment (PPE)
- Safe disinfection and disposal of contaminated PPE and other materials
- Safe disposal of bodies and dignified burials
- Safe disposal of animal carcasses
- Interpersonal Communication (client-patient interactions and counselling skills, orientation on how health worker would interact with CBS focal persons etc.)
- Recording and basic data analysis

Note:

- Orient or reorient the sub-county PHEMC, rapid response team and other health and non-health personnel on epidemic management based on the current epidemic.
- In an urgent situation, there often is no time for formal training.
- Provide on job training (OJT) as needed.
- Make sure there is an opportunity for the training clinician 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, health staff at all health facilities must be vigilant in surveillance of the disease, condition or events, by liaising with the community health volunteers or any person identified as community informants. For example, members of the response teams and health staff in affected facilities should:

- Actively search for additional cases who meet the case definition and refer them to the health facility or treatment centers.
- If necessary, quarantine suspected cases or isolate the confirmed cases for management.
- Ensure they have access to consistent/adequate food, water, and non-food items such as soap, chlorine, firewood, medicines, sanitary pad.
- 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).
- Monitor the effectiveness of the outbreak response activity.
- Provide daily updates during the epidemic.
- Actively trace and follow up contacts as indicated (**See Section 4** for how to do contact tracing)

6.3.4 Enhance surveillance with neighboring border sub-counties/counties/countries

During response, it is important also to work closely with neighboring sub-counties /counties /countries to ensure the outbreak does not spill over. It is important to share information and also plan for joint surveillance and response activities

Initiate the establishment of the cross-border disease surveillance and response committees to provide a platform for sharing surveillance data, epidemiological and other related information during the outbreak.

The committee should draw membership from both neighboring sub-counties/ counties and the composition should include at least:

- The focal person responsible for IDSR
- The focal person responsible for laboratory services
- The medical officer of health
- The focal person responsible for environmental health
- The focal person responsible for clinical services
- The focal person responsible for animal (domestic and/or wildlife) health, local immigration officials and the local administrators. The committee can also co-opt other members depending on the disease profile and the disease outbreak/public health emergency they are handling.

During the emergencies, the committee will meet as soon as a public health emergency is identified and then weekly or fortnightly as it continues. The committee will continue to hold routine quarterly meetings during the inter-epidemic period to review disease trends, other early warning systems, and their level of preparedness

6.3.5 Engage Community during response

Community Health Assistants (CHAs) or the Animal Health Assistant (See Definition in Introduction section) can be the first responders and take steps to make the situation as safe as possible for the community. Some of the actions include the following:

- Engage and inform community leaders on the situation and actions that can be taken to mitigate the situation
- Provide first aid and call or send for help.
- Keep people away from a 'risk' area (e.g., potentially contaminated water source).
- Respectfully quarantine anyone with a potentially infectious disease paying particular attention to cultural sensitivities.
- Inform the next level on need for quarantine for animals, market closures, etc.
- Provide community education including specific actions the community can take to protect themselves.
- Advocate for IPC and hygiene promotion in coordination with other stakeholders.
- Identify local effective channels for delivery of the information to the community;
- Organize door-to-door campaigns utilizing trusted individuals to reach every household within the catchment area in order to curb the spread of the public health event and to encourage self-reporting, treatment and health-seeking behavior among people who have had contact with the public health event or are suspected to be public health event cases This will promote the prevention of the spread of the public health event, encourage self-reporting, treatment and health-seeking behavior 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 Risk communication to the community

Effective risk communication 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 limited. Communicating advice and guidance, therefore, may be the most important public health tool in managing a risk. The following should be done:

- Keep the public informed to calm their fears and encourage cooperation with the response efforts. Develop community education messages with information about recognizing the illness, how to prevent transmission, when and where to seek treatment.
- Begin communication activities with the community as soon as an epidemic or public health events is identified.
- Identify community groups or local civil society organizations or outreach teams that can help gather information and amplify the messages.

- Ensure consistency in content of messaging between all messengers (community leaders, health care personnel, religious leaders, etc.)

The following should be considered for effective risk communication;

1. Decide what to communicate by referring to disease specific recommendations in **Section 11.0.** Make sure to include:
    - Signs and symptoms of the disease
    - How to manage the disease at home if home treatment is recommended
    - How to prepare disinfectant solutions.
    - Prevention behaviors that are feasible and that have a high likelihood of preventing disease transmission
    - When to come to the health facility for evaluation and treatment
    - Immunization recommendations, if any.

At the same time, maintain active processes for collecting qualitative information needed to establish and address any circulating rumors.

2. Decide how to state the message. Make sure that the messages:
    - Use local terminology
    - Are sensitive to the religious beliefs
    - Are culturally sensitive and acceptable
    - Are simple, clear and concise
    - Consider local norms
    - Address beliefs and myths about the disease

Note: Pre-test the messages from similar settings before dissemination.

Sample community education messages are in **Annex 6F** at the end of this section.

3. Select appropriate communication channels that are present in your county. E.g.,
    - Mass media (radio, television, newspapers)
    - Meetings (health personnel, community, religious, opinion and political leaders)
    - Information, Educational and communication (IEC) materials (posters, fliers)
    - Multi-media presentations (e.g., films, video or narrated slide presentations) at the markets, health centers, schools, women's and other community groups, service organizations, religious centers.
    - Social media (Facebook, Twitter, WhatsApp, etc.)
    - Community drama groups/play groups
    - Public address system
    - Corporate/ Institutional website
    - Email/ SMS subscriptions
    - Road shows

4. Give health education messages to community groups and service organizations and ask that they disseminate them during their meetings.
5. Give health education messages to trusted and respected community leaders and ask them to transmit to the community.
6. Designated person from the MoH should serve as spokesperson to the media. Tell the media the name of the spokesperson, and that all information about the outbreak will be provided by the spokesperson
7. Release information to the media only through the spokesperson to make sure that the community receives clear and consistent information.
8. On a regular basis, sub-county and County medical officers will meet with the Local Leaders to give:
    - Frequent, up-to-date information on the outbreak and response
    - Clear and simple health messages for the media
    - Clear instructions to communicate to the media the information and health education messages from the PHEMC

6.3.7 Conduct a mass vaccination campaign

Collaborate with the Division of National Vaccine and Immunization Program (DNVIP) program managers/directors to conduct a mass vaccination campaign, if indicated. Develop or update a micro plan for the mass vaccination campaign as soon as possible. Speed is essential in an emergency vaccination because time is needed to obtain and distribute vaccine.

Determine the target population for the activity based on the case and outbreak investigation results (refer the DVIP guidelines for specific recommendations about delivery of the indicated vaccines).

A worksheet called "Planning a mass vaccination campaign" is in **Annex 6C** at the end of this section.

A worksheet called "estimating vaccine supplies for vaccination activities" in **Annex 6D** at the end of this section. **Annex 6E** describes recommended vaccination practices during vaccination campaigns.

6.3.8 Improve access to clean and safe water

Containers that hold drinking water can be the vehicle for disease outbreaks including cholera, typhoid, Shigella and Hepatitis A and E.

Educate the community on treating the water at household level. The daily water needs per person during non-outbreak situations are shown below. Water needs are much higher during an outbreak situation, especially outbreaks of diarrheal diseases.

Table 17: *Minimum Water quantity needs calculations*

Daily water needs per person*

	Non-outbreak situation	During outbreak of diarrheal disease
Home use	20 liters per day	50 liters
Health care setting	40 to 60 liters per day	50 liters in wards 100 liters in surgery 10 liters in kitchen

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

Safe sources of drinking water include:

- Piped chlorinated water
- Chlorination at point-of-use
- Protected water sources (e.g., boreholes rain water collected in a clean container)
- Boiled water

If no local safe water sources are available during an emergency, water supply may need to be brought from outside. To make sure that families have safe and clean drinking water at home ensure:

Community education on how to keep home drinking water safe. **Refer to annex 6F** for sample community messages and references to specific prevention guidelines for preparing safe water at home.

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 feces should at least be 30 meters or more away from sources of water.

6.3.9 Ensure safe disposal of infectious waste

To make sure that human excreta are disposed safely to avoid secondary infections due to contact with contaminated substances:

- Assign teams to inspect local areas for human and animal waste disposal. Safe practices include disposing of feces in a latrine or burying them in the ground more than 30 meters away from water supply.
- If unsafe practices are found such as open defecation, provide information to the community about safe disposal of the waste, mobilize the community to construct latrines appropriate for local conditions and scale up community led total sanitation (CLTS)
- 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 hygiene:

- Conduct community education on food hygiene practices for the general public and those in the food industry.
- Visit restaurants, food vendors, food packaging factories, and so on to inspect food-handling practices. Look for safe practices such as proper hand-washing facilities, cleanliness and adherence to national standards.
- Close restaurants, vending areas or factories if inspection results show unsafe food handling practices.
- Enforce the relevant laws on food hygiene and safety.

6.3.11 Reduce exposures to infectious or environmental hazards

As indicated by the outbreak or event, take action to reduce exposure to hazards or factors contributing to the outbreak or event. This may involve chemical, physical or biological agents. Technical requirements for reducing exposure will be determined according to national policy and through collaboration with those who have experience in these areas. E.g., occupational or industrial exposure to heavy metals (for example, lead) will require coordination with multiple ministries and partners.

Community education and behavior change interventions can be supportive in engaging the community to effect changes that will limit exposure to dangerous levels of chemicals and other hazards.

For vector-borne diseases, engage the service of experts such as an entomologist in designing appropriate interventions that will reduce exposure to the offending vectors. For example, for anopheles' mosquito borne-illness work with the malaria control program coordinator in your sub-county to:

- Promote indoor residual spraying program
- Conduct community education to sleep under long lasting insecticide treated nets (LLINs) how to avoid dusk-to-dawn mosquito bites.
- Promote the use of locally available insecticide treated materials (blankets, clothes, sheets, curtains, etc.)
- Encourage environmental sanitation e.g., removing stagnant water, clear bushes etc.
- Encourage prevention of diseases carried by rodents by helping people in your sub-county reduce their exposure to these animals. For example, rodents can transmit the virus that causes Lassa fever or they may be infested with fleas that carry plague. Work with the vector control officer in your sub-county to 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 possibilities of rodents nesting in the room.
- Use chemicals (insecticides, rodenticides, larvicides etc.) and traps as appropriate based on environmental and entomological assessment.
- Educate community on personal protection to reduce exposure

6.3.12 Ensure safe and dignified burial and handling of dead bodies

Dead body management forms a critical role in combating the spread of infectious diseases both as a part of case detection and surveillance as well as managing potentially infectious material. VHF, Cholera and unexplained deaths in suspicious circumstances are situations that require careful handling of bodies. It is also essential to dispose of bodies in a safe and dignified manner by trained personnel due to the infectiousness of an epidemic prone disease.

Disinfect and decontaminate homes and hospital wards where cases died of highly infectious diseases. A Guide should be prepared to ensure proper disinfection or decontamination of homes and hospitals where there are corpses of suspected infectious disease (Interim Guidelines on handling of human remains-Ministry of Health)

Dead body management guidelines currently distinguish between high and low priority/risk bodies, utilizing a team that have received training. Deaths that are considered high risk may be treated as a form of surveillance and case detection for Viral Hemorrhagic Fever (VHF) or possibly other conditions when relevant testing capabilities are available.

Safe burials can be conducted in the community at approved burial sites at the discretion of the families. The NTF/EPR committees should develop a safe and dignified burial contingency plan when an infectious disease outbreak occurs and the plan should be reviewed periodically to address the evolution of the epidemic.

6.3.13 Ensure appropriate and adequate logistics and supplies

A dedicated logistic team is needed during an outbreak response.

Throughout the outbreak, monitor the effectiveness of the logistics system and delivery of essential supplies and materials. Carry out logistical planning to make sure transport is used in the most efficient ways. Monitor the reliability of communication between teams during the outbreak and if additional equipment is needed (for example, additional airtime and data bundles for mobile phones), take action to provide teams with what they need to carry out the response activities.

Monitoring the implementation of the outbreak or event is key for outbreak control. The monitoring results will be important for including in the report of response to supervisory levels, to community leaders and for future advocacy.

Ensure there is ongoing monitoring of:

- Disease trends in order to assess the effectiveness of the response measures, the extent of the epidemic and risk factors
- Effectiveness of the response: case fatality rate, incidence
- Implementation of the response: program coverage, meetings of the epidemic management committee etc.
- Availability and use of adequate resources, supplies and equipment
- Community acceptability of response efforts
- Regular reporting on stocks 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 **(refer to Annex 6G).** Provide information developed by the PHEMC to the concerned health facilities. In the situation updates, provide information such as:

- Details on the response activities. Include dates, places, and individuals involved in each activity. Also include the "Epi" curve, spot map, table of person analysis, and the line list of cases
- Any changes that were made since the last report
- Effectiveness of the response: case fatality rate, incidence
- Implementation of the response of the EPR committee etc.
- Operational challenges and gap

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. A suggested format of the report is in **Annex 7A**. Steps for monitoring and evaluating a response are in **Section 8.**

6.5 Document the response

During an outbreak and also at the end, the sub-county health management team should:

- Collect all the documents including minutes of the meeting, activity, process, epidemic report, evaluation report and other relevant documents.
- Prepare a coversheet listing of all the above documents.
- Document lessons learned and recommended improvements and update Country EPR plan, event/disease specific plan and other relevant SOPs and Tools in line with these where appropriate (After Action Review - AAR).
- Compile an outbreak response report

This will become an essential source of data for evaluating the response. **Refer to Section 8**, on how to monitor, evaluate, supervise and provide feedback on IDSR activities.

Annexes to Section 6

Annex 6A: Treat cases during an outbreak

Annex 6B: Preparing disinfectant solutions from ordinary household products

Annex 6C: Planning an emergency immunization campaign

Annex 6D: Estimating vaccine supplies for immunization activities

Annex 6E: Recommended immunization practices

Annex 6F: Sample messages for community education, hand-washing, safe handling of food, safe disposal of human waste, clean drinking water and storage, safe burial of bodies and reducing exposure to mosquitoes

Annex 6G: Outbreak communication

Annex 6H: Key IPC Measures, donning and doffing, guide for hand washing, guide for CTC Cholera establishment

Annex 6I: Response to chemical and radio-nuclear events

Annex 6A: Case management during an outbreak

Use appropriate medicines and treatment for managing cases during an outbreak. Below are treatment recommendations for use in an outbreak situation for:

- Cholera
- Dysentery
- Measles
- Bacterial meningitis.

Note: For detailed treatment guidelines of these and other diseases of priority concern, please refer to the specific disease guidelines e.g. cholera case management

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

i. Assess the patient for signs of dehydration. See assessment guide below.
ii. Give fluids according to the appropriate treatment plan (see next page).
iii. Collect a stool specimen/rectal swab from the first 5-10 suspected cholera cases seen and randomize samples thereafter
iv. 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 SEVERE DEHYDRATION* sunken eyes not able to drink or drinking poorly Give fluid for severe dehydration skin pinch goes back very slowly **(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 **(Plan B)** skin pinch goes back slowly	SOME DEHYDRATION Give fluid according to "for some dehydration"
If there are not enough signs to classify as some or severe dehydration	NO DEHYDRATION Give fluid and food to treat diarrhea at home. **(Plan A)**

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

Note: Plain 5% glucose (dextrose) solution is not recommended.

Give a total of 100 ml/kg Ringer's Lactate Solution divided into two periods as indicate below:

Age	**First period**	**Second period**	**Total**
< 1 year	30 ml/kg in 1 hour	70ml/kg in 5 hours	100 ml/kg in 6 hours
≥ 1 year and adults	30 ml/kg in 30 min	70 ml/kg in 2 1/2 hours	100 ml/kg in 3 hours

More than one IV lines may be necessary to give the first bolus treatment.

When IV rehydration is not possible and the patient can't drink, ORS solution can be given by nasogastric tube.

Note: 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 hypoglycemia and hypokalemia 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 antibiotic of choice for all patients, including pregnant women.

If resistance to doxycycline, azithromycin (1 g orally as a single dose for adults and 20 mg/kg (max 1g) orally as a single dose for children < 12 years.

	First-line	Alternative
Adults (including pregnant women)	Doxycycline 300 mg as a single dose	Azithromycin PO 1g as a single dose
Children < 12 years old	Doxycycline 2-4 mg/kg single dose	Azithromycin PO 20mg/kg single dose
Zinc supplementation for children Zinc supplementation in the management of children 6 months to 5 years with watery diarrhea reduces the frequency and severity of the episode as well as the frequency of subsequent diarrhea. 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, but more slowly.

Continue monitoring the patient and replacing fluid until the diarrhea stops.

When the patient is ready to leave the facility, counsel the patient on treating diarrhea at home.

Refer to IMCI guidelines for treating children under 5 years of age and to national guidelines for further information on treating acute watery diarrhea 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 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 or household bleach). 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 diarrhea 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

D**ischarge**

Consider to discharge if patient:

Has no signs of dehydration

Is able to take ORS without vomiting.

Has no watery stools for 4 hours

Is able to walk without assistance.

Is passing urine.

Has been advised when to return to hospital/CTC.

Prior to discharge, provide patients and their caretakers with ORS and instructions on how to prepare it.

Inform patient, family members and caretakers about precautions and instructions at household level:

For children, continue breast-feeding of infants and young children

Drink and use safe water.

Wash hands at critical times including after using a toilet (including helping a child) and before preparing and eating food. If caring for a patient, always wash hands after proving care and after handing any soiled items such as clothes or linens.

Cook food thoroughly and eat it while it is still hot.

Remove and wash any bedding or clothing that may have had contact with diarrheal stool with the appropriate chlorine solution (0.02%). If chlorine is not available, patients' bedding and clothing can be disinfected by stirring them for 5 minutes in boiling water and drying in direct sunlight, or by washing with soap and drying it thoroughly in direct sunlight.

Use a flush toilet or approved septic system; double bag soiled materials when discarding in trash.

Use any household disinfectant or a 1:10 dilution of bleach solution (1part bleach to 9 parts water) to clean any area that may have contact with fecal matter, as soon as possible after being soiled.

If a household member develops acute, watery diarrhea, 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 can be allowed if the ill person wants company; visitors should also observe hand hygiene recommendation

Give patients information about home care before they leave the health facility on danger signs and when to return to the facility again;

Return for treatment if the patient develops any of the following:

a) increased number of watery stools
b) eating or drinking poorly
c) marked thirst
d) repeated vomiting
e) fever
f) blood in the stool

2. Give an appropriate oral antibiotic for outbreaks of bloody diarrhea due to Shigella dysentariae type

Source: WHO Guidelines for the control of epidemics due to S. dysentariae type 1. WHO Geneva. 1995

(iii) The table below shows management of patients with S.dysentriae type 1

	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 sulphametho -xazole	PEDIATRIC TABLET 20 mg trimethoprim + 100 mg sulphametho-xazole	SYRUP 40 mg trimethoprim + 200 mg sulphametho-xazole per 5 ml
Children's dose					
3 - 5 kg	¼	1/4	1/4	2	5.0 ml
6 - 9 kg	½	1/2	1/2	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	TABLET 250 mg	TABLET 160 mg TMP +800 mg SMX		
	4 tablets	4 tablets	2 tablets		

Measles case management

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

(iv) The table below shows Vitamin A capsule dosage

AGE	Vitamin A Capsules		
	200 000 IU	100 000 IU	50 000 IU
Up to 6 months		1/2 capsule	1 capsule
6 months up to 12 months	1/2 capsule	1 capsule	2 capsules
12 months up to 5 years	1 capsule	2 capsules	4 capsules

4. Give appropriate antibiotic for bacterial meningitis cases during and outside an outbreak

Admit patients to a health facility for diagnosis and treatment perform 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.

Ensure any child under 2 years of age or any patient with severe symptoms is admitted to the health center for in-patient treatment and adjust the treatment as necessary. **(Treatment protocols in the table below**)

Note: Patient isolation is not necessary. Provide good supportive care and simplify case management.

Treatment protocol for Meningitis

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.

Annex 6B: Preparing disinfectant solutions from ordinary household bleach solutions

During a response to an outbreak of any disease transmitted through direct contact with infectious body fluids (blood, urine, stool, semen, and sputum for example), an inexpensive system can be set up using ordinary household bleach.

The following table describes how to make 1:10 and 1:100 chlorine solutions from household bleach and other chlorine products.

Use this chlorine product	To make a 1:10 solution for disinfecting: -- Excreta -- Cadavers -- Spills of infectious body Fluids	To make a 1:100 solution for disinfecting: -- Gloved hands -- Bare hands and skin -- Floors -- Clothing -- Equipment -- Bedding
Household bleach 5% active chlorine	1 liter bleach per 10 liters of water	100 ml per 10 liters of water, or 1 liter of 1:10 bleach solution per 9 liters of water
Calcium hypochlorite powder or granules 70% (HTH)	7 grams or 1/2 tablespoon per 1 liter of water	7 grams or 1/2 tablespoon per10 liters of water
Household bleach 30% active chlorine	16 grams or 1 tablespoon per 1 liter of water	16 grams or 1 tablespoon per10 liters of water

To disinfect clothing:

Promptly and thoroughly disinfect patient's personal articles and immediate environment using one of the following disinfectants:

Chlorinated lime powder

1% chlorine solution

1% to 2% phenol solution

Promptly and thoroughly disinfect patient's clothing:

Wash clothes with soap and water

Boil or soak in disinfectant solution

Sun dry

Wash utensils with boiling water or disinfectant solution

Do not wash contaminated articles in rivers or ponds that might be sources of drinking water, or near wells.

Annex 6C: Planning an emergency immunization activity
The following should be done:

Review with health workers the need to plan vaccination campaigns and specify the target population for the immunization activity

Estimate the necessary amounts of vaccine, diluent, and immunization supplies such as sterile syringes and sterile needles, cold boxes, vaccine carriers and safety boxes

Coordinate with NVIP, WHO country office and UNICEF offices to arrange for provision of necessary vaccine and supplies

A list of pre-qualified WHO vaccines is available at: http://www.who.int/immunization_standards/vaccine_quality/PQ_vaccine_list_en/en/.

The ICC to ensure the discussion is done and agreed on the type of vaccine to be given, who to give and the methodology to be used

Contact the national level to request vaccine. If a national reserve stock is not available, the DVIP will request an emergency supply from WHO.

3) Choose the immunization sites and inform the community.

Coordinate with the EPI/IVD or disease control program in your sub-county to identify sites for conducting the immunization activity.

Identify the facilities that can participate in the activity

Identify a mobile immunization team, if needed.

Determine if there are any hard-to-reach areas, e.g., a transient workers' camp. Identify a mobile immunization team to reach these areas.

Contact the facilities and schedule the immunization sites.

Make sure there is enough capacity to store extra amounts of the vaccine during storage and transportation to the immunization site.

4) Conduct a comprehensive micro planning for the campaign. A micro plan is the operational plan for a campaign at the county or lower level. Ensure the plan has at least the following:

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

List of supervisors and their contact numbers

Travel plan for teams and supervisors including transportation requirements

Map the coordination with other partners and regions/sub-counties local partners like NGOs, faith-based and civic organizations etc.

Maps of the targeted area

Cold chain requirements and maintenance

Plan for distribution of logistics

Plans for disposal of waste from campaign

Social mobilization plan with community leaders mapped and engaged

Training schedule

Budgetary estimates for the various campaign components including training and planning prior to implementation and waste disposal following implementation

5) Select immunization teams. For every 100 to 150 people expected at the immunization site, the followed staff is required:

One to two vaccinators to give immunizations

One recorder to record on immunization cards

Community health workers if already exist or an identified community volunteer to verify age and immunization status.

6) Work with your EPI/IVD team to conduct refresher training for vaccinators on recommended immunization practices. Ensure instructions are given for the use of safe injection techniques.

7) Mobilize the community. Inform the public about the emergency immunization

Activity 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 group who 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 rumors that may arise during the campaign
f) There is a single point of contact well versed in risk communications and the local culture
g) There is a clear plan for monitoring any adverse effects

8) Arrange staff transportation to the immunization site.

a) Plan their transportation to and from the site
b) Schedule vehicles and plan for fuel and other costs
c) Estimate per diem costs and make necessary arrangements for lodging if the site is away from the health worker's usual station.

9) Monitor the overall campaign process and the number of doses of vaccine given.

a) Collect daily summary sheets from teams
b) Calculate the amounts of remaining stocks and supplies necessary for the next day
c) Estimated number of individuals vaccinated should be followed daily and tracked against target population
d) Follow up visit plans should be made for missed individuals based on tally/summary sheet information
e) Document any missing houses/individuals who should be follow up on subsequent days
f) Review the team available at sight and if necessary, reallocate/deploy the teams to other sites basing on the workload
g) Conduct brief feedback sessions at the end of each day with vaccination teams and make necessary mid-course corrections

Note: A rapid guide to common SIA problems and potential quick fixes is available at:

http://www.polioeradication.org/Portals/0/Document/Resources/PolioEradicators/1c.QuickFixesforSIA20100914.pdf

Give instructions for use of safe injection techniques. Review with health workers the need to plan vaccination campaigns

Annex 6D: Estimating vaccine supplies for immunization activities

Outbreak: Date confirmed:

Target Population Children age 0 up to 5 years

Children age 9 months up to 14 years

Children and adults age 0 up to 30 years

Women of childbearing age - 15 years up to 45 years

All adults and children in the general population

1) Calculate the size of the target population. If the activity only targets a proportion of the general population, estimate the size of the target population. Multiply the general population times the percentage of children or adults in the target population. If you do not know the exact age distribution rates in your area, use recommended estimates such as the following:

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

2) Find out how many doses each person should receive. Record the number below as "number of doses recommended."

3) Allow for wastage. Use a wastage factor of 20%. Multiply the size of the target population (see step 1) times the

number of doses times 1.20.

_____ X _____ x 1.20 =

Size of target population Number of wastage Number of doses recommended doses to order including wastage

Note: It is recommended that the wastage factor of 20% should be used only at the national level to estimate vaccine requirement during an outbreak. At the subnational and sub-county levels use 15% wastage factor and health facility level use wastage factor of 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.

x 1.25 =

Number of doses Contingency factor Total number of estimated doses including wastage

NB: It is recommended that the contingency stock is kept only at the national level however if a subnational level adequate capacity for vaccines storage, 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 vial required Total number of vials

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

_____ X _____ = _____

Diluent required per vial Total number of vial Total diluent to order

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

8) In addition, estimate the number of dilution syringes necessary for preparing the vaccine. Source: *Field Guide for Supplementary Activities Aimed at Achieving Polio Eradication, World Health Organization, Geneva 1997. Sub-county guidelines for yellow fever surveillance, Division of Emerging and other communicable disease surveillance and control, World Health Organization, Geneva 1998.*

9) Estimate the number of safety boxes required

Annex 6E: Recommended immunization practices

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

Reconstitute the vaccine correctly:

a) Determine the appropriate quantity of diluent to reconstitute the freeze-dried vaccine.
b) Use a sterile syringe and sterile needle for each dose.
c) Using the dilution syringe, draw up and expel the diluent several times in the vial that contains the vaccine so as to mix the reconstituted vaccine well.
d) Wrap the vial in silver foil or cover it with a dark cloth. This will protect the vial from sunlight.
e) In a field situation, protect the vaccine and diluent from contamination. Cover the open top of the vial with foil to keep out dirt and flies.
f) Place reconstituted vaccine vials and opened liquid vaccine vials immediately stand them on shilled ice, or stand them on an ice pack. Keep the ice and vaccines in the shade.
g) Follow multi dose vial policy as applicable e.g., for measles and polio,
h) Record the dose on an immunization card for each person immunized, if it is national policy to require immunized persons to have a card.
i) Collect data for monitoring the activity. For example, record the number of doses given on a tally sheet so that coverage from the campaign can be calculated.
j) Remind health workers about the risk of getting blood-borne diseases from an accidental needle stick. Review safe practices for handling and disposing of sharp instruments and needles using a sharps box.
k) 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 medical waste disposal guidelines.

Annex 6F: Sample messages for community education
Improve hand washing

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

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

Message:

Note: ARE YOU PROTECTED FROM DYSENTERY (bloody diarrhea)? Washing your hands protects yourself and others from disease.

Always wash your hands:

a) after defecation
b) after cleaning a child who has defecated
c) after disposing of a child's stool
d) before and after eating
e) before preparing or handling food.

ARE YOU READY FOR HAND-WASHING? Do you have

Clean water and soap (or if you do not have soap, use ash or earth to scrub your hands)

Clean cloth for drying.

Message

Safe Handling of food

Encourage the following food safety practices:

a) Wash hands with soap before preparing food
b) Thoroughly wash the fruit and green vegetables before consuming using clean water
c) Cook food until it is hot throughout
d) Eat food while it is still hot, or reheat it thoroughly before eating
e) Wash all cooking and serving utensils after use
f) Keep cooked food and clean utensils separate from uncooked foods and potentially contaminated utensils

g) Cover your food appropriately.

Message:

DO YOU PREPARE FOOD SAFELY? Cooking kills germs

a) Thoroughly cook all meats, fish and vegetables
b) Eat cooked meats, fish and vegetables while they are hot.
c) Washing protects from disease
d) Wash your hands before preparing or serving food
e) Wash your dishes and utensils with soap and water
f) Wash your cutting board especially well with soap.
g) Peeling protects from disease
h) Only eat fruits that have been freshly peeled (such as bananas and oranges)

Note: KEEP IT CLEAN: COOK IT, PEEL IT, OR LEAVE IT.

Five Keys to Safer Food

a) Keep clean
b) Separate raw and cooked
c) Cook thoroughly
d) Keep food at safe temperature
e) Use safe water and raw materials



Figure 30: *Five ways to Safeguard Food*

Safe disposal of Human Waste

High priority should be given to ensuring the safe disposal of human waste at all time, and especially during epidemics of diarrhea.

Sanitary systems appropriate for local conditions should be constructed with the cooperation of the community.

Community messages should emphasize:

a) Everyone should use latrines properly, including children
b) Transfer children's excreta with a scoop or shovel to the latrine or bury in a hole.
c) Avoid defecating on the ground, or in or near the water supply.
d) When large groups of people congregate—as for fairs, funerals, or religious festivals—, ensure the safe disposal of human waste. If there is no latrine, designate areas for defecation and provide a shovel to bury the excreta.

Message:

ARE YOU PROTECTED FROM DYSENTERY (bloody diarrhea)? DO YOU USE A TOILET OR LATRINE?

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

Always use a toilet or latrine. It you don't have one – build one!

Keep the toilet or latrine clean

Wash your hands with soap (or ash) and clean water after using the toilet or latrine.

KEEP IT CLEAN: USE A TOILET OR LATRINE

Clean drinking water and storage

Community drinking water supply and storage

Piped water. To maintain safety, properly chlorinate piped water. To prevent entry of contaminated groundwater into pipes, repair leaking joints and maintain constant pressure in the system.

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

Trucked in. If locally available water is likely to be contaminated, drinking water should be supplied by tankers or transported in drums, if it is adequately chlorinated and a regular supply can be ensured. The trucking of water, however, is expensive and difficult to sustain; it is usually considered a short-term measure until a local supply can be established.

Home drinking water storage and treatment

When the safety of the drinking water is uncertain, it should be chlorinated in the home or boiled.

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

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.

Narrow-mouthed containers with an opening too small to allow the insertion of a hand. Water should be removed by pouring from the opening or spout.

Water used for bathing, washing and other purposes other than drinking need not be treated and should be stored separately from drinking water

Safe disposal of bodies

The body fluids of persons who die due to diarrhea or a viral hemorrhagic fever are still infectious. Use extreme caution when preparing the bodies of suspected cholera or viral hemorrhagic fever patients. Encourage safe funeral and burial practices (National/WHO guidelines)

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 defense for malaria prevention.

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 colors, 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)

Malaria transmission can rapidly be reduced by indoor residual spraying (IRS) with insecticides. IRS works for between 3 to12 months, depending on the insecticide used and the type of surface on which it is sprayed.

Annex 6G: Outbreak communication

Introduction

Following confirmation and verification of the event, the Community, health facility, the sub-county and the County level authorities should liaise with the national level authorities to communicate and receive guidance on common positions to be delivered to the media

From first announcement throughout the outbreak, communication from the sub-county 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 sub-county public health response level to obtain first-hand information from direct sources.

In addition, the Sub-County MOH (SCMOH) should support the communication and provide scientific expertise as evidence for intervention.

Actions at the county level

a) Identify spokesperson(s) at county level (political and technical)
b) Liaise regularly with national authorities to provide them with first-hand information (received at the community local level, the media, local stakeholders)
c) Be in contact regularly with national authorities to receive common messages including guide and answers for frequently asked questions to feed the local media
d) 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
e) Organize press briefings to provide regular information to local media, following directions from national level
f) Develop good relationships with local media to partnership for delivery of accurate, transparent, timely messages to the population
g) Use information materials developed at the national level with clear consistent messages to provide guidance to the population
h) Identify local powerful channels for the delivery of information to the population
i) Meet regularly with local stakeholders to disseminate correct message of prevention and surveillance to the population
j) Organize preventive door-to-door campaigns to reach the remote rural areas and promote prevention and surveillance, following directions from national level.

Annex 6H: Guide to infection prevention and control measures

Hand Washing

Purpose: To protect the patient, staff and care givers from cross infection

Responsibility: Clinicians, Environmental health practitioner, care giver

Steps in hand washing:

1. The hands are washed thoroughly for a minimum of 10-15 seconds with soap (plain or antimicrobial) and running water (tap or run to waste method)
2. Remove jewelries (rings, bracelets) and watches before washing hands, ensure that the nails are clipped short (do not wear artificial nails), Roll the sleeves up to the elbow.
3. Wet the hands and wrists, keeping hands and wrists lower than the elbows (permit the water to flow to the fingertips, avoiding arm contamination).
4. Apply soap (plain or antimicrobial or ash) and lather thoroughly.
5. 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.
6. Rub for minimum of 10-15 seconds.
7. Repeat the process if the hands are very soiled. Clean under the fingernails.
8. Rinse hands thoroughly, keeping the hands lower than the forearms. If running water is not available, use a bucket and pitcher.
9. 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.
10. 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 hand. Use a paper towel, clean towel or your elbow/foot to turn off the faucet to prevent re-contamination.

Different types of antiseptic disinfection:

1. Using antiseptics, hand rubs gels or alcohol swabs for hand antisepsis
2. Apply the product to the palm of one hand. The volume needed to apply varies by product.
3. Rub hands together, covering all surfaces of hands and fingers, until hands are dry
4. Do not rinse.

Note: When there is visible soiling of hands, they should first be washed with soap and water before using waterless hand rubs gels or alcohol swabs

In situations where soap is not available, ash can be used for washing hands

Hand Hygiene Techniques

This is a process, which mechanically removes soil and debris from skin and reduces the number of transient microorganisms. Hand washing 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:

1. Thoroughly wet hands.
2. Apply a hand-washing agent (liquid soap); an antiseptic agent is not necessary.
3. Vigorously rub all areas of hands and fingers for 10–15 seconds (tip: 10 average breaths), paying close attention to fingernails and between fingers.
4. Rinse hands thoroughly with clean running water from a tap or bucket.
5. Dry hands with paper towel or a clean, dry towel or air-dry them.
6. Use a paper towel or clean, dry towel when turning off water if there is no foot control or automatic shut off.

Source: World Health Organization (WHO) 2005.

Note:

a) If bar soap is used, provide small bars and soap racks that drain.
b) 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.
c) 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.
d) When soap dispensers are reused, they should be thoroughly cleaned before filling.
e) 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.
f) Used water should be collected in a basin and discarded in a latrine if a drain is not available.

Guidance to donning and doffing of PPE

Steps to put on PPE using coverall:

a) **Identify and gather the proper PPE to don.** Ensure choice of gown size is correct (based on training).
b) **Perform hand hygiene using hand sanitizer.**
c) P**ut on isolation gown.** Tie all of the ties on the gown. Assistance may be needed by other healthcare personnel.
d) **Put on a medical mask (Surgical Mask or Respirator) depending on risk of exposure**
e) **Facemask:** Mask ties should be secured on crown of head (top tie) and base of neck (bottom tie). If mask has loops, hook them appropriately around your ears.
f) **Respirator:** Respirator straps should be placed on crown of head (top strap) and base of neck (bottom strap). Perform a user seal check each time you put on the respirator.
g) **Put on face shield or goggles.** (When there is risk of aerosol generation) When wearing an N95 respirator or half facepiece elastomeric respirator, select the proper eye protection to ensure that the respirator does not interfere with the correct positioning of the eye protection, and the eye protection does not affect the fit or seal of the respirator. Face shields provide full face coverage. Goggles also provide excellent protection for eyes, but fogging is common.
h) **Put on gloves.** Gloves should cover the cuff (wrist) of gown.

Steps to Doffing

Step 1: Remove the gloves and perform hand hygiene

Step 2: Remove apron and perform hand hygiene:

Step 3: Remove the gown and perform hand hygien

Step 4: Remove eye wear and preform hand hygiene

Step 5: Remove head cover and perform hand hygiene

Step 6: Remove boots and put them in a receptacle for cleaning and disinfection and perform hand hygiene

Step 7: Remove masks and perform hand hygiene

Step 8: Put on a new surgical mask and exit the unit

Setting up a cholera isolation camp/unit/Cholera Treatment Center (CTC)

a. Site management

There are different recommendations for different situations/circumstances

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 refugee camps

Cholera treatment services in refugee (or internally displaced people) camps are relatively straightforward to organize.

The entire population is concentrated and contained within a limited geographical area ("closed setting")

A single central CTC is usually all that is necessary to manage severe cases and several ORPs are implemented across the camp to care for less severe cases.

Depending on the size of camp, one or more ambulances should circulate between the ORPs, bringing severely ill patients to the CTC.

In Urban Settings

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 can become a problem.

Ambulances can be provided for referral, or a CTU may be established as an intermediate structure. Use of taxis/buses should be discouraged given the high contamination risk during the journey.

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 paralyse routine health services as adequate case management is labor-intensive and other health services may suffer from staff shortage. 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 Points (ORPs)

ORS points 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. The community health worker should receive quick training and regular supplies, to be able to achieve given objectives.

Design of a CTC

Selection criteria when establishing a cholera treatment centers, the following should be considered when selecting a site:

- Proximity to the affected area.
- Easy accessibility for patients and supplies.
- Protected from winds (there should be wind breaks)
- Adequate space.
- Compatibility with adjacent existing structures and activities
- Availability of adequate portable/safe water supply within a minimum distance to avoid contamination.
- Good drainage from the site
- Provision of waste management facilities (clinical and general waste)
- Availability of sanitary facilities (temporary)
- Provision for extension of CTC (basing on estimation given by epidemiologist)

Setting up a temporary cholera treatment camp

In setting up a cholera camp, you can use an existing building or set up tents:

- It is important to consider safety of patients and ventilation as high temperatures contributes to dehydration of the patients.
- The cholera camp should operate 24 hours a day independently of the other health facilities and therefore the necessary staff has to be recruited.
- It should be supplied with the necessary medical material specifically for the center.
- 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 come out (through patients, water, material, solid and liquid waste etc.)

General rules for a good design:

i. Strict necessary movement for staff and patient
ii. Each zone is a "closed box"
iii. Systematic disinfection between zones
iv. Discipline and mutual control for the patient, attendant and staff on hygiene

Note: Good infection control means anything coming out is free of contamination

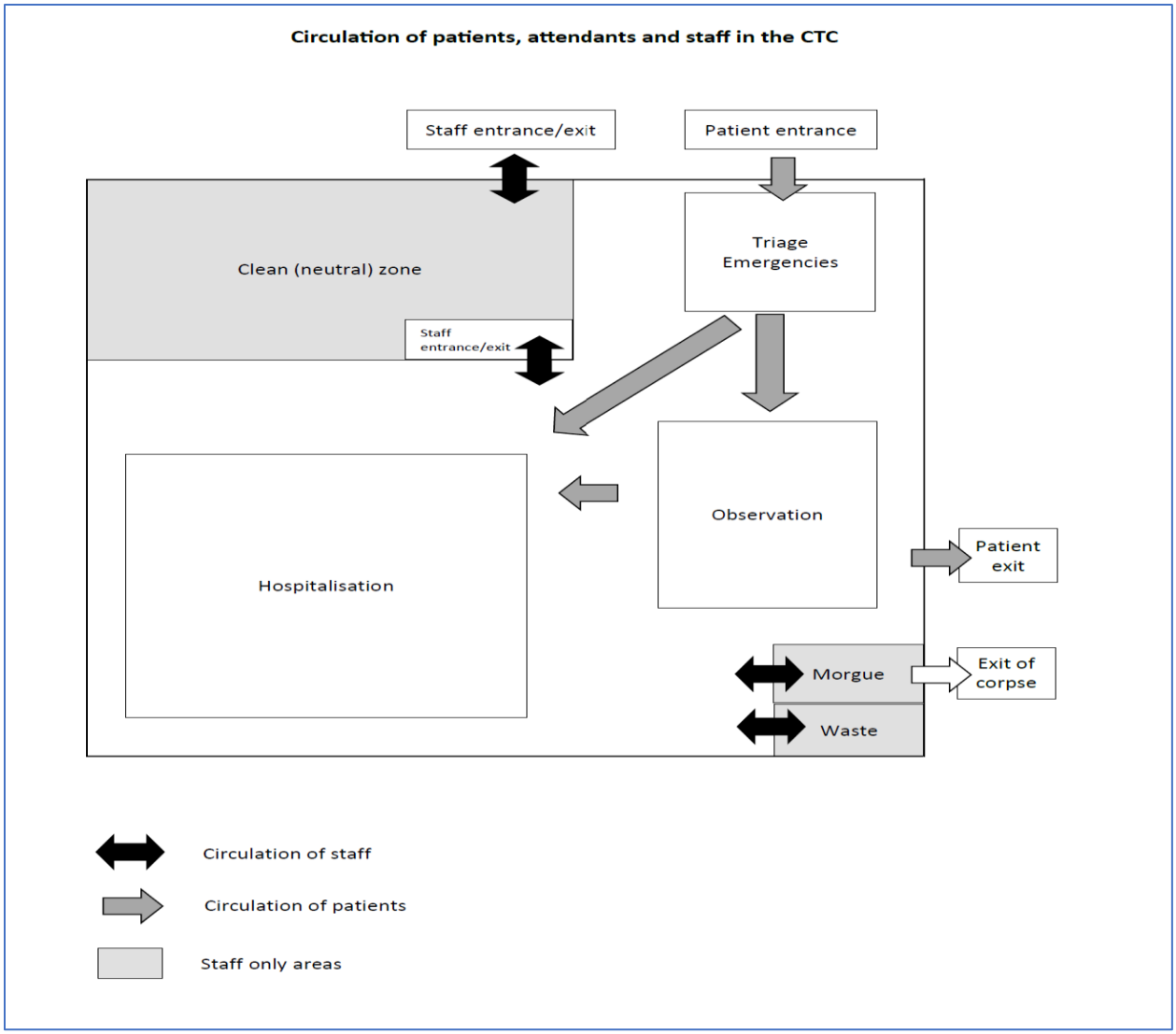


Figure 31: *Layout of a cholera treatment center (CTC)*

Triage and observation Area

1. Patients are examined by a medical person for screening. If cholera, admit; otherwise send to normal dispensary.
2. Patients are admitted with 1 attendant (caregiver) if necessary.
3. Patients who are admitted are registered in the cholera line list.
4. A foot bath should be provided at the entrance
5. Toilets and water should be easily accessible for patients.
6. Shower facilities should be provided for the patients.
7. A disinfection area should be provided for the transporting vehicles and contaminated articles for the patients.
8. Tables, chairs, water containers fitted with taps, refuse receptacles should be provided in these areas.
9. Provision of safe water
10. Establish an ORP corner

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 besides 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 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).
- Cholera beds with receiving buckets, buckets for those who vomit and water containers for patients.
- Tables and chairs for staff
- Refuse receptacles
- Patients should be screened by medical staff and categorized according to their status.

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.

The patients who are no longer vomiting nor have diarrhea and requiring less medical attention can be put in this ward.

Separate rooms/tents should be provided for males and female.

Annex 6I: Response to chemical and radio-nuclear events

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 provide first aid for serious injuries immediately, before
- conducting radiological monitoring
- Keep people away from any potential source of exposure (at least 10 m from the public)
- Arrange to transport seriously injured people to local medical facility.
- Wrap them in a blanket to control the spread of contamination. Tell those transporting
- victims and the receiving medical facility that the person may be contaminated and that
- the risk to those treating such a patient is negligible but care should be taken to prevent
- inadvertent ingestion of contamination.
- Identify and register potentially exposed/contaminated individuals. Gather information
- that could be useful in reconstructing their dose to include medical symptoms and
- description of events.
- Report to appropriate officials and obtain instructions
- If not seriously injured, remain in the area until monitored.

Respond to action threshold:

If an accident is confirmed:

- Reassess and review with relevant departments and agencies 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 reference to 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 program.
- Establish a registry of persons to be tracked and to receive long-term follow-up.
- Base inclusion in the registry on objective criteria that indicate 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.

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.

Internal contamination

- Use instrumental detection methods such as whole body counting, gamma camera, and thyroid counting.
- Radionuclides may be in the blood or excreted in the feces or urine.
- Excreta should be placed in appropriate containers and blood samples in test tubes for counting.

Decontamination Procedures

Materials:

a) Lukewarm water, soap or ordinary detergent, soft brush, sponges, plastic sheets, tape, towels, sheets, iodine tablets or solution.
b) Procedural priority:
c) Remove all clothing and place in plastic bags.
d) Carry out life saving measures first.
e) Identify contaminated areas, mark clearly and cover until decontamination takes place.
f) Start with decontamination of wounds when present, and move on to the most contaminated area of the body.

Local contamination:

- Cover uncontaminated area with plastic sheet and tape 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 min.
- Avoid vigorous scrubbing.
- A stable isotope solution may facilitate the process.
- For wounds, irrigate with normal saline solution repeatedly.
- Surgical debridement might be considered in some instances.
- Eyes and ears may be irrigated gently with isotonic saline solution.

Extensive contamination:

- Shower those 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.

Inhalation:

- Irrigate nasopharynx and mouth.

Ingestion:

- Administer cathartics for insoluble materials.
- Administer diuretics by forcing fluids for soluble contaminants.

Prophylactic measures

- Cover areas still contaminated with plastic sheet and tape edges.
- Gloves can be used for hands.
- Repeat washing after allowing the skin to rest.

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.

Expected outcome

Radionuclide activity is no longer detectable or is decreasing.

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

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 team should do primary medical assessment to identify and manage life threatening conditions.

Assess vital signs:

- Airway
- Breathing
- 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:

- 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.
- Hospital services:
- 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.
- Recognizing and diagnosing health effects of chemicals in chemical events

Agent /Type	Agent Name	Any unique Characteristics	Initial Effects
Nerve	Cylohexyl sarin Sarin (GB) Soman (GD) Tabun (GA) VX	Miosis (pinpoint pupils) Copious secretions Muscle twitching/fasciculation	Miosis (pinpoint pupils) Blurred/dim vision Headache Nausea, Vomiting Diarrhoea Copious secretions Sweating Muscle twitching/fasciculation Breathing difficulty Seizures
Asyphxiant/Blood-Arsine	Cyanogen chloride Hydrogen cyanide	Possible cherry red skin Possible cyanosis	Possible frostbite Confusion Nausea Patient may gasp for air similar to asphyxiation but more abrupt onset Seizure prior to death
Choking/Pulmonary damaging	Chlorine Hydrogen chloride Nitrogen oxide Phosgene	Chlorine is a greenish yellow has with pungent odour Phosgene gas smells like very newly mown hay or grass Possible frostbite	Eye and skin irritation Airway irritation Dyspnoea, cough Sore throat Chest tightness
Blistering/Vesicant	Mustard/Sulfur Mustard (HD, H) Mustard(gas) Nitrogen musard Lewisite (L)	immediately decontaminate skin; flush eyes with water or normal saline for 10-15 minutes if breathing difficulty, give oxhygen any supportive care	Possible pulmonary oedema *Mustard has an asymptomatic latent period* There is no antdocte or treatment for mustard Lewisite has immediate burning pain, blisters later Specific antidote British Anti Lewisite (BAL) may decrease systemic effeccts of Lewisite
incapacting/ behaviour-altering	Agent 15/BZ	May appear as mass drug intoxcation with ecastic behavior, disticnt hallucinations and confusion Hyperthemia Mydriasiasis (dilated pupils)	May cause death Dry mouth and skin Initial tachycardia Altered consciousness, delusions, denial of illness, beligerence Hyperthemia Ataxia (lack of coordination) Hallucinations Mydriasis (dilated pupils)

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 of hypotension 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 apneic 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 minutes	

Note:

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 vapors.

Avoid dermal contact with cyanide contaminated victims or with gastric contents of victims who may have ingested cyanide-containing materials.

Victims exposed only to hydrogen cyanide gas do not pose contamination risks to rescuers. If the patient is a victim of recent smoke inhalation (may have high carboxyhemoglobin levels), administer only sodium thiosulfate.

If sodium nitrite is unavailable, administer amyl nitrite by inhalation from crushable ampoules.

Available in Pasadena Cyanide Antidote Kit, formerly Lilly Cyanide Kit.

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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES FOR KENYA

THIRD EDITION



Section 7: RISK COMMUNICATION

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7.0 Risk Communication

Risk communication is an essential element of disaster and emergency preparedness and response and is one of the core capacities in the International Health Regulations 2005 (IHR 2005). Risk communication is 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 is able to take informed decisions to mitigate the effects of the threat (hazard) such as a disease outbreak and take protective and preventive action. Risk communication 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, social mobilization and community engagement.

The current 21st century, has witnessed an exponential growth in travel, trade and migration, coupled with also communication technology revolution 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 that is a core public health intervention in any response to disease outbreaks/epidemics, pandemics and other health emergencies *(Communicating Risk in Public Health Emergencies: Geneva. World Health Organization 2017, License CC BY-NC-SA 3' IGO).*

It is therefore important for risk communication to be conducted effectively so as to promote 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 and pandemics, and humanitarian crises and natural disasters, effective risk communication allows people most at-risk to understand and adopt protective behaviors. 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 functioning service. It also provides decision makers with summary information especially if there was an outbreak response, allowing them to review how resources were applied to contain the event.

7.1 Risk Communication in the context of IDSR

Integrated Disease Surveillance and Response (IDSR) strategy is an approach for improving public health surveillance and response for priority diseases, conditions and events at community, health facility, sub-county, county and national levels. Since IDSR is a system with the potential to ensure

a reliable supply of information to the national level in order to fulfill IHR requirements, risk communication should be integrated in all the IDSR core functions and activities particularly detection, sample collection, reporting, analysis and 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 for IDSR

If well planned and integrated in IDSR, risk communication can improve decision making and adoption of recommended behaviors by communities and contribute to the prevention, control and response to priority diseases and other public health events. Such communication needs to be carefully planned, implemented, monitored and evaluated as well as properly integrated with emergency management activities and operations at community, sub-county, county and national levels to support all the relevant core IDSR functions and related activities at that level.

7.1.1 Benefits of Risk Communication

Risk communication improves decision making compliance with treatment and required behaviors for preventive actions, 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 and pandemics, and humanitarian crises and natural disasters, effective risk communication allows people most at-risk to understand and adopt protective behaviors. It allows authorities and experts to listen to and address people's concerns and needs including dynamic listening and managing rumors that are bound to occur, this is key because various actors can relate to the advice, they provide is relevant, trusted and acceptable. It is critical that-risk communication is not only targeted at outbreak response, risk communication plans should be included 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 organize and resources may be few. Hence communicating advice and guidance 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 behaviors when they are linked to functioning systems and services. It facilitates heightened disease surveillance, reduces confusion, and minimizes miscommunication and falsehoods (rumors) in relation to the cause, transmission of a disease and proven effective protective actions. It allows for a better use of resources, all of which 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 hospitals and clinic staff

- Surveillance Officers
- Laboratory staff
- Point of Entry and Exit
- Airlines staff
- Immigration officers
- Travelers
- Stakeholders (policy-makers, ministries of health, maternal and child health organizations, partners, community organizations, et al.)
- Media as a channel to reach these audiences
- Schools and workplaces
- Traditional and Religious leaders
- Security officers and other law enforcement agencies

7.1.3 Community Engagement and its importance in public health emergency preparedness and response

In conducting risk communication, Community Engagement (CE)is an important key component. Community engagement is the process of working collaboratively with and through people affiliated by geographic proximity, special interest, or similar situations to address issues affecting the wellbeing and 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 involve:

- Determine the goals of the Community Engagement plan
- Plan out who to engage
- Develop engagement strategies
- Prioritize Community Engagement activities
- Create an implementation plan
- Monitor your progress

Effective community engagement helps you to:

- Know the community (problem and needs)
- Understand the existing health beliefs, attitudes and practices
- Listen to the community carefully
- Analyze community dynamics
- Involve the community in all aspects of the response beginning from planning stages

7.1.4 Approaches for Risk Communication

The components of effective emergency risk communication include:

- Health education
- Social mobilization

- Community engagement
- Media and social media
- Outbreak communication
- Crisis communication
- Messaging (Information Education and communication (IEC) Social and Behavior change Communication (BCC))
- Dynamic listening, Rumor monitoring and managing
- Advocacy

7.1.5 Integrated Risk Communication Model

Since risk communication is a complex activity involving different audiences, having an integrated approach in risk communication is very crucial. The key components for integrated emergency risk communication are indicated in **Figure 31.** This model allows for the successful design and implementation of an effective communication strategy. The model highlights the necessity of a collaborative approach between different target audiences across the board.

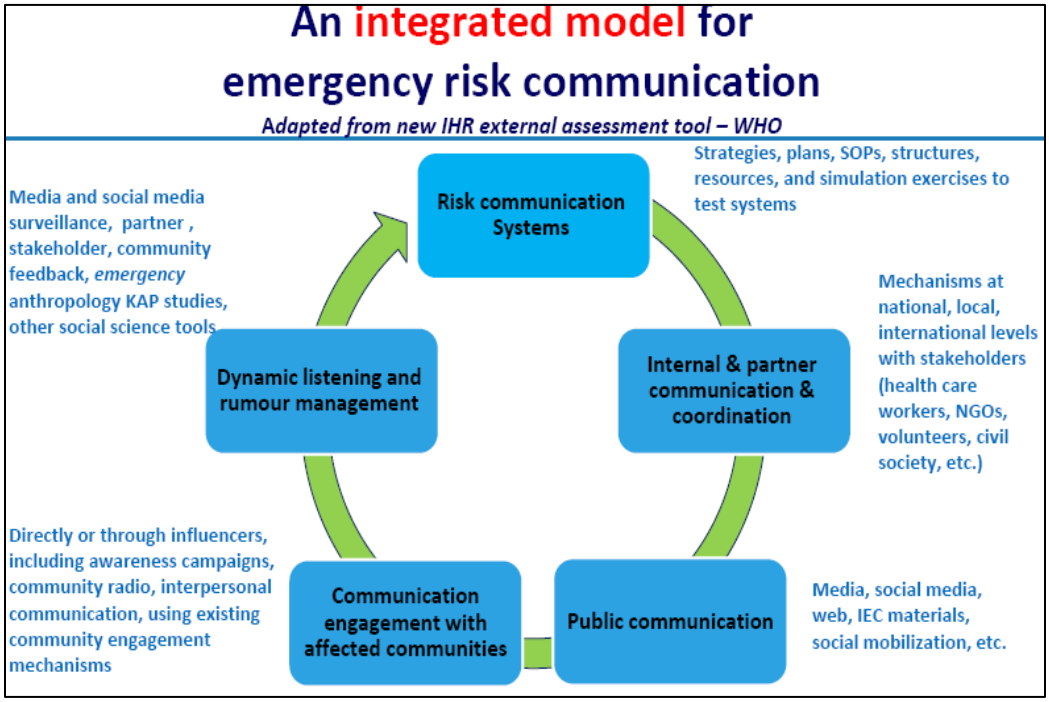


Figure 32: *An integrated model for risk communication*

7.2 Key inter-linked Principles for Effective Communication:

There are 5 key principles for effective risk communication as outlined below:

Creating and Maintaining Trust

Building and maintaining trust is, arguably, the most important function of an effective communication during an outbreak or a public health event and should include:

- Timely, transparent information sharing regarding the nature of the threat,
- The response to the event and
- Actionable advice on protective actions people can take, linked to functioning services to increase self-efficacy

This creates trust 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 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, explanations that address community concerns (social science intelligence)

Provision of simple, understandable and trusted advice that they are likely to follow to save lives and bring the outbreak under control in the shortest possible time, in their own languages adapted to their educational levels and preferences (i.e., oral, written or visual), on channels and through interlocutors of their choice, (translational communication), and

Meaningful community engagement and the participation of (their) trusted interlocutors/messengers (means of dissemination)

Risk communication should include timely, transparent, understandable information to affected and at-risk population about;

1. The nature of health risk they face,
2. What is being done towards mitigating the risk as response is being undertaken?
3. What can they do to protect themselves and those important to them

Trust is thus the important component of risk communication for all public health interventions, and has, evolved overtime emerged as the critical element for effective risk communication (i.e., that the expert advice is acted on by key stakeholders as well the and affected and at most 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 highlights that to build trust, risk communication interventions should;

- Be linked to functioning and accessible services
- Be transparent and timely
- Be easy to understand the target populations (i.e., in their preferred oral or visual forms; and in their own languages or dialects, targeted to their educational levels and cultural references)
- Acknowledge and communicate uncertainty (don't over reassure, don't speculate; but communicate frequently so that the evolution of an event and our understanding is transparent and not a cause of destroying trust)
- Link to self-efficacy (can people really do what you ask them, do they have the ability, equipment, services, education they need to adopt our advice?)
- Be disseminated using multiple platforms, methods and channels
- 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.

Timely announcements and transparency:

In most cases, public response to a health threat depends on the way the first and subsequent announcements are made. This 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
- Use of multiple platforms, mechanisms and trusted speakers to ensure that consistent and coordinated information reaches stakeholders and the population

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 better listen to community concerns and understand their contexts that influence if 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-through's, focus group discussions, key informant interviews, getting feedback from stakeholders, social media and media monitoring, etc. A serious attempt must be made to

make health interventions and health advices, based on evidence gathered using these methods and other social science approaches.

Advance Planning

Risk communication is most effective when it is integrated with emergency preparedness, risk analysis and response (risk management). This means that a risk communication plan must be prepared during the preparedness stage. Emergency risk communication planning must occur in advance and be a continuous process with a focus on preparedness and prevention as well as response. Planning should be sensitive to stakeholders' needs. It should be participatory, responsive to the context and incorporate feedback from affected groups.

The International Health Regulations (IHR) 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, County and sub-county 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.

Ensuring Equity:

All citizens have a right to appropriate information about health risks, including what needs to be done in response to threats to their health. Unfortunately, large segments of society are excluded from routine communication about threats to health. Risk communication must therefore ensure equitable sharing of information to the public and avoid exclusion of marginalized members of society from health action. This means paying attention to the reach of communication, using trusted channels and interrogator, not using jargon or technical language, use of people's own languages and dialects, adapting messages to people's levels of understanding and education; and ensuring that the actions promoted are those that people can realistically change. Special attention should be paid to analysing power dynamics in communities and taking special measures to reach those hardest to reach (women, minorities, the very old and young, people with disabilities, the poor, migrants and refugees, etc.)

7.3 Create an enabling environment for effective communication to the populations at-risk

Establish risk communication systems and structure at the sub-county, County and national levels.

If not present, then establishing multi-sectoral communication committees/ structures across all levels i.e., National, County and Sub-county Levels (See **Annex 5E** for the examples of members of the communication subcommittee and roles) TORs can be expanded depending on the pre outbreak, outbreak and post outbreak phase in line with each function. See **Annex 7F** for an expanded list of possible stakeholders.

Reviewing the existing structure and mechanisms for risk communication

- Ensure the communication system has a link to the community leadership structure as they have a strong impact to community. A quick assessment can be made to evaluate the framework for public health emergency risk communication and this can include**:**
    - Based on risk profile, carry out assessment to identify risk communication needs
    - mapping of risk communication stakeholders at all levels and develop database
    - resource mapping for risk communication
- Conduct mapping of languages and dialects; religions; preferred and trusted means/channels/ and interlocutors (sources) for communication; traditional practices that are relevant for the top priority health risks and use this intelligence to shape risk communication strategies and plans
- If not available at sub-county, county and national level, designated government spokesperson and ensure he/she is trained in procedures for public communication
- In addition to risk communication personnel, all frontline personnel should receive basic training in risk communication (surveillance, contact tracing, case management, social mobilization, community engagement, burial teams, health personnel, volunteers).
- Develop a Risk Communication Plan for Public Health Emergencies at the sub-county, county, and national level and ensure key stakeholders are oriented on the procedures for Risk Communication.
- Develop a coordination platform and mechanisms for internal and partner communication for engaging key stakeholders including media outlets; community radio networks; including roles and responsibilities
- Have detailed budgets and advocate strongly for resources mobilization, and multi-sectoral collaboration to implement public health emergency and risk communication activities at all levels.
- Create a system for dynamic Listening and rumor Management

Note: Refer to **Annex 7E** for checklist for monitoring risk communication

7.4 Communicating before, during and after the outbreak

7.4.1 Pre-Outbreak/Routine Risk Communication

A big proportion of communication activities should be implemented in the pre-emergency phase – for better preparedness. Persons managing communication activities should take advantage of the absence of an emergency to build/strengthen 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 practice of behaviors that can prevent the risk.

Before an outbreak, the following should take place:

- The Public Health Emergency Management Sub-Committee for Risk Communication should meet at least once monthly or quarterly to;
- review the risk communication plan and required risk communication materials/logistics
- develop, pre-test, print and disseminate appropriate IE&C materials based on the common public health risk
- organize training of risk communication resource teams
- Ensure communication coordination mechanism, is in place with clear terms with 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 sub-county, County or national media, community radios, civil society and stakeholders from other sectors for example, involve the animal health sector in countries where zoonotic influenzas are a priority threat
- Review past emergency communication interventions to draw lessons learned, build on successful practices and avoid negative ones.
- Collect and analyze 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 standard operating procedures (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, CSO, theatre groups and other community groups that can disseminate messages at the grassroots level and involve them in preparedness activities
- **Identify all the channels of communication** available to spread the message and assess the reach and credibility of these channels.
- Produce a 'Response Kit' which includes key frequently asked questions, media briefs, training manual, micro-planning tools, monitoring checklists/tools, communication plan templates and key IEC messages/materials for rapid distribution. This kit is for the use of communication practitioners at all levels.
- Establish communication lines with media; journalists, radio/TV stations; train them and keep them continuously up-dated.
- 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 SBCC and risk communication
- Identify mechanisms for communicating with hand-to-reach and vulnerable populations (older persons, persons with disabilities, children, the nomadic) 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 that describe actions that the government is taking to protect the public and health care workers, promote awareness of the coming health threat and preventive behaviors and actions that individuals, families and communities can take to reduce the risk and this can be done through mass media e.g., local community radios, public health address, community drama groups, Television including print media including social media Facebook, websites, twitter, etc.
- Conduct community engagement activities and build trusted relationships between those in authority and communities through training, dialogue, consultations, 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" etc.
- Use ongoing health education, health promotion and other means to create, test and build trust in the systems, interlocutors 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 list of media house

Develop plans for routine monitoring of misinformation and rumors and set up a media monitoring system for keeping track of behaviors and practices related to the emergency

Note:

It is important to integrate to the extent possible, social science data that should be gathered too. Data on the context, socio-cultural information (including education, traditional practices, health seeking and health care giving behavior, 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, be created basing on the risks and shape possible health interventions.

It is important to 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 local, County or national media, community radios, civil society and stakeholders from other sectors for example, involve the animal health sector in countries where zoonotic influenzas are a priority threat.

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, often stands as the most important public health tool in managing a risk. The focus of outbreak communication is to promote outbreak control and mitigate disruption to society by communicating with the public in ways that build, maintain or restore trust.

Pro-active communication encourages the public to adopt protective behaviors, facilitates heightened 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 and care about the public and build 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, remember that people have a right to information on protective actions and they have a right to participate in and shape interventions that are acceptable to them.

Figure 33 illustrates a typical epidemic curve which tracks number of cases over time that could occur during an infectious disease outbreak. The yellow area represents the number of cases which could be avoided with the control opportunity of a rapid response to the threat.

The blue arrow indicates the point at which proactive communication plays a crucial role in supporting such a rapid response. By alerting a population and partners to an infectious disease risk, surveillance of potential cases increases, protective behaviors 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.

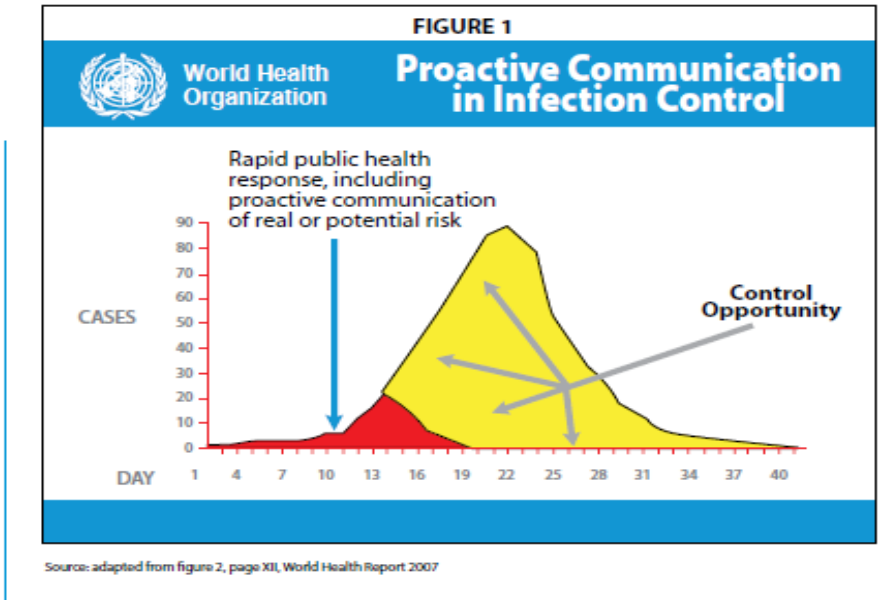


Figure 33: *Epidemic Curve Showing the Importance of Proactive communication*

7.4.2.1 Identify and coordinate partners and other stakeholders during an outbreak

Outbreaks usually create fear in the community. Involvement of different stakeholders sometimes leads to uncoordinated and duplication of effort. Provision of timely and accurate information through a well-coordinated mechanism of stakeholders is important.

Internal coordination of communication among national, county and sub-county stakeholders is key during an emergency. The "Risk Communication and Social Mobilization Subcommittee" which has been described in **Section 5**, has the responsibility of ensuring that there is an internal communication system among national stakeholders to ensure 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** for the potential partners and stakeholders who can be involved .It establishes routine communication structures among health workers, community and partners. It helps ensure that this vital link is available and functional during an emergency. If a sub-county, county or 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 and thereby promote trust and the likelihood that expert advice will be followed.

The PHEMC through the PHEOC or through a similar coordination structure at national level may take responsibility for ensuring communications are consistent and reflect the data that has been analyzed. Ensure the focus of the 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 interlocutors such as the media and civil society (and the general population) will require targeted and adapted products and messages. This means that carefully segmenting and targeting audiences, adapting materials, messages and mechanism to suit each of them is essential.

7.4.2.2 Communication with the affected community and stakeholders

Communication with affected communities and stakeholders, including the media is essential during outbreak and event response. Thus, establishing routine communication structures and processes between the health and community partners helps to ensure that this vital link is available and functional during an emergency. Options for communicating between the various partners can range from press releases, press conferences, television and radio messages, meetings (health personnel, community, religious, opinion and political leaders); Educational and communication materials (posters, fliers); Multi-media presentations (for example, films, video or narrated slide presentations) at the markets, health centers, schools, women groups, national and county administrative officers and other community groups, service organizations, religious centers, local community media, Social media (Facebook, Twitter, WhatsApp, etc.), SMS, telephone, hand-carried message, Community drama groups/play group; site visits; fax, email updates and exchanges of communication materials to more formal decision-making committees. Regardless of the mechanism, ensure that the focus is on transparent and trustworthy communication that considers community experiences. Ensure the messages are;

Clear and understandable to the audience: The message(s) needs to provide information on:- What, why and how it is happening? What threats to public 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 two-way communication exchange; listen to audience's concerns and respond appropriately rather than just informing.

Demonstrate empathy and caring: always show empathy for their suffering, be friendly and respectful**.**

Harmonized and Consistent messages: ensure that consistent messaging goes to the public notwithstanding the different partners involved in 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. The messages must be 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: in collaboration with surveillance and response teams, there is need to compile key facts including rumor tracking to inform messaging.

Update public information message and share it with players involved in information dissemination

Relevance: communicate information that best illustrates the situation and their concerns. Use examples that relate to the audience.

Note: Consider pre-testing the messages from similar settings before production and dissemination

In case of rumors, quickly respond to them and any inaccuracies in general and especially within the specific audience where they have occurred. Consider setting up a Rumor monitoring system.

Widespread damaging rumors should be counteracted through public statements or press conferences. Provide comprehensive information to prevent rumors being generated from your response activities

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 crisis period.

On a regular basis, sub-county and county health management teams should meet with the Local Leaders to give:

Frequent, up-to-date information on the outbreak and response

Clear and simple health messages for the media

Clear instructions to communicate to the media only the information and health education messages from the PHEMC

7.4.2.3 Develop and disseminate IEC materials

Information, Education and Communication (IEC) materials such as posters, flyers, factsheet among others both in print and electronic formats need to be designed and produced in good time. For example, fact sheets are brief summaries of 1 to 2 pages. They are usually prepared by health staff for consumption by the general public and deal with a single topic or message. For example,

a fact sheet on a *Shigella* outbreak in a sub-county may contain the following information for the community; the cause of *Shigella*, how it is transmitted, steps for prevention and updates on the number of cases and deaths.

The fact sheets could be posted on a bulletin board or distributed to community groups that are planning health education campaigns. 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). These can be used depending on the preference of the audience for audio (oral or visual/written/illustrated communication). See attached Example in the **Annex 7A.**

Distribute other IEC materials which have been prepared. Ensure they have been pre-tested with the target audience to ensure comprehension and meaning.

7.4.2.4 Develop and disseminate public health situation reports during outbreaks

During a disease outbreak the national level prepares and disseminates a disease outbreak situation report. The county reporting the outbreak needs to prepare and disseminate their own SitReps. These reports will be produced more regularly and describe the outbreak. The SitReps are usually brief (2 to 8 pages) and have a wider audience than just the health staff in a particular sub-county or health facility. They are seen by policymakers, legislators and other decision-makers. They are valuable channels for reaching technical and donor partners.

The SitReps contain at least:

- A summary table showing the number of reported cases and deaths to date for each priority disease
- A commentary or message on a given disease or topic
- Inclusion of any relevant social science data on risky practices, behaviors and other factors.

A sample template for preparing a situation report is in **Annex 7C.**

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, brief and educate the media on priority diseases, hazards and on response systems, and provides them with appropriate information so as to cultivate a respectful and trusted relationship with them. 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, then there is need to convene a workshop with targeted media which will be 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 prior to the outbreak you have reached out to media and identified the key outlets you will need to work with during an outbreak. It is also good prior to an emergency, to identify the clearance process for media products (messages should be approved by the authorities) and appreciate the following:

a) Ensuring prompt and frequent access to experts, officials and identification of spokespersons at national and county levels who will speak authoritatively and credibly on the issue at hand.
b) Provide media training for spokespersons
c) 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 as simple as possible and the talking points should have latest information. Please ensure that spokespersons identified could also communicate the uncertainty in an evolving event well, and admit when they don't know something. Community case definitions and job aids will aid the spokesperson to deliver correct messages.
d) Promptly answering journalists` calls as a show of respecting them
e) Give them accurate and well explained information.
f) Give exclusive stories and interviews to provide a different perspective
g) Provide human interest stories
h) 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.

Ensure monitoring 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

Ensure you communicate regularly with the health workers by providing correct information pertaining 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 these data and measures that are 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 correct information of number of cases and any death that has occurred. Also, ensure you provide any changing information regarding case management or any other response intervention.

Encourage health workers to keep updated, and to update them 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 disease and on risk communication.

Increasingly during emergency response to disease outbreaks, WHO 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, sub-county/county staff who led the investigation should prepare a report within one week. The purpose of the report is to document how the problem was identified, investigated, responded to, what the outcome was, decision taken and recommendations made. Make sure that the health unit that reported the initial cases receives a copy of the report. The report should be disseminated to decision makers, stakeholders and the community using a variety of channels. 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 health 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 interventions and if it followed the plan which was developed for the response.

7.4.3.3 Periodic testing of the Risk Communication Plan

Carry out simulations to test 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, AAR or other assessment done.

WHO provides ready-made desk top and other simulation exercises on the www.OpenWHO.org?

Annexes to Section 7

Annex 7A: Sample Fact Sheet

Annex 7B: Sample sub-county outbreak report

Annex 7C: Template for preparing public health event situation report

Annex 7D: Outbreak Investigation report sample

Annex 7E: IHR core capacity monitoring questionnaire for risk communication

Annex 7F: List of Stakeholders and Partners for risk communication

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. However, information is 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, health care 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 your 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; 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 (so that food reaches 70°C in all parts— "piping" hot — 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 now taking place.

Are health care workers at-risk from the influenza A (H7N9) influenza virus?

Health care 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 health care workers be closely monitored. Together with standard precautions, health care 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. Health care personnel caring for patients with suspected or confirmed HPAI H5N1 virus infection should wear recommended personal protective equipment and follow recommended infection control measures (standard, droplet, contact, and airborne precautions).

Annex 7B: Sample sub-county outbreak report

Title/Description (include disease/condition investigated)

Period Place (Villages, Sub-County, County)

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 health care system
- Results of additional case finding
- Lab analysis and results
- With text, describe key features of results of time, place, and person analysis
- For detailed results by time (epi curve), place (map), and person characteristics (tables) and line lists
- Results of response and evidence of impact

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

Epidemic Preparedness

Indicator	Yes	No
Were adequate drugs and medical supplies available at the onset of the outbreak		
Were treatment protocols available to health workers?		
Does the sub-county 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 sub-county 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 sub-county [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 sub-county [date 1] and sub-county field investigation conducted [date 2] (Target: within 48 hours)			
Interval between sending specimens to the lab [date 1] and receipt of results by the sub-county [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 sub-county [date 1] and concrete response by the sub-county [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]			

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

Evaluation of other aspects of the response:

Interpretations, discussion, and conclusions:

Recommended public health actions:

Comment on following levels: community, health facility, sub-county, partners, provincial, and national

Sub-county Public Health Emergency Management Committee Chairperson:

Name Signature

Sub-county Medical Officer:

_____ _____

Name Signature

Date report completed: _____ _____

Annex 7C: Template for preparing public health event situation report
Sub-county Epidemiological Week Ending (date)

I. Epidemiological Situation: Week (insert week number and date here)

Table 1: Epidemiological Situation: Week____

Disease	Cases	Deaths	Fatality (%)	Sub-counties in Alert	Sub-counties 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____**

Sub-counties	Cases	Deaths	Fatality (%)	Sub-counties in Alert	Sub-counties in Epidemic	Reported week	Timeliness (%)	Completeness (%)
D1								
D2								
Dn								
Total								

Comments:

Graphs (This section provides a graphical representation of data)

Epidemic Trends

Annex 7D: Outbreak Investigation report sample

Report on Cholera Outbreak in Garissa County February 2018

1.0 Introduction

Cholera is an acute enteric infection caused by the ingestion of bacterium *Vibrio cholerae* present in faecally contaminated water or food. Primarily linked to insufficient access to safe water and proper sanitation, its impact can be even more dramatic in areas with inadequate basic environmental infrastructures.

Cholera is characterized in its most severe form by a sudden onset of acute watery diarrhoea that canlead to death by severe dehydration. The extremely short incubation period - two hours to five days - enhances the potentially explosive pattern of outbreaks, as the number of cases can rise very quickly. About 75% of people infected with cholera do not develop any symptoms. However, the pathogens stay in their faeces for 7 to 14 days and are shed back into the environment, possibly infecting other individuals. Cholera is an extremely virulent disease that affects both children and adults. Unlike other diarrhoeal diseases, it can kill healthy adults within hours.

2.0 Background Information

Garissa is one of the administrative Counties in Kenya. The county has a population of 923,060, and a land area of about 45,720.2 km² and more than 260,000 Somali refugees in Dadaab refugee camps within the County.

Garissa has six constituencies namely: Garissa Township, Ijara, Dadaab, Lagdera, Fafi and Balambala. The county is low lying, with altitudes ranging between 70m and 400m above sea level.

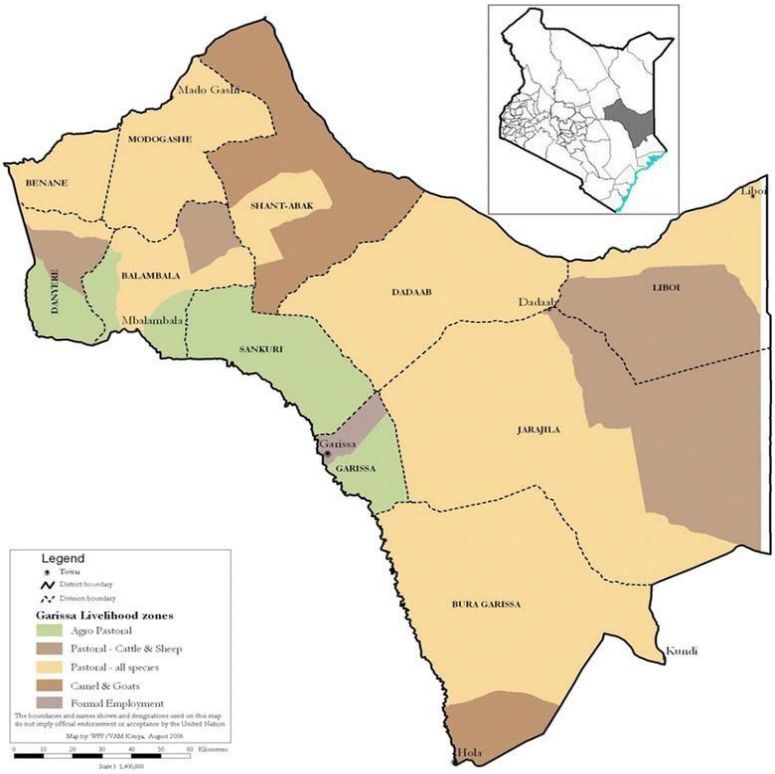


Figure 34: *Map of Garissa County Showing Administrative Sub Counties*

3.0 History of the Outbreak

The outbreak started in the outskirts of a place known as Hagarbul in Dadaab Sub County onJanuary 1st 2018. A cluster of eight cases were seen and treated in Hagarbul dispensary; recovered and discharged.

The dispensary continued to get cases until 25th January with just one last case seen on 5th February 2018. There have not been any other cases in the area.

Cases in Garissa Sub County were initially imported from neighbouring areas that were experiencing cholera outbreak. The implicated areas were those neighbouring on the Tana River County and from Hagarbul. Later persons that contacts with cholera cases were also seen and persons that had no travel history.

One week after outbreak onset in Garissa, Sankuri area started reporting cases that mainly came from across the river Tana in Tana River County.

Interventions initiated included setting up cholera treatment centres (CTCs) in Hagarbul, Sankuri, Madogo and in Garissa CR Hospital. Elaborate WASH interventions were put in place in Sankuri eventually transmission stopping in that area.

Update of Cholera Cases in Garissa County as at 17th February 2018

The outbreak is still on-going with cholera cases still being admitted to cholera treatment centres. As of 17th February, there were ten patients in the CTC at the Garissa County Referral Hospital.

Epidemic Curve of Cholera Outbreak

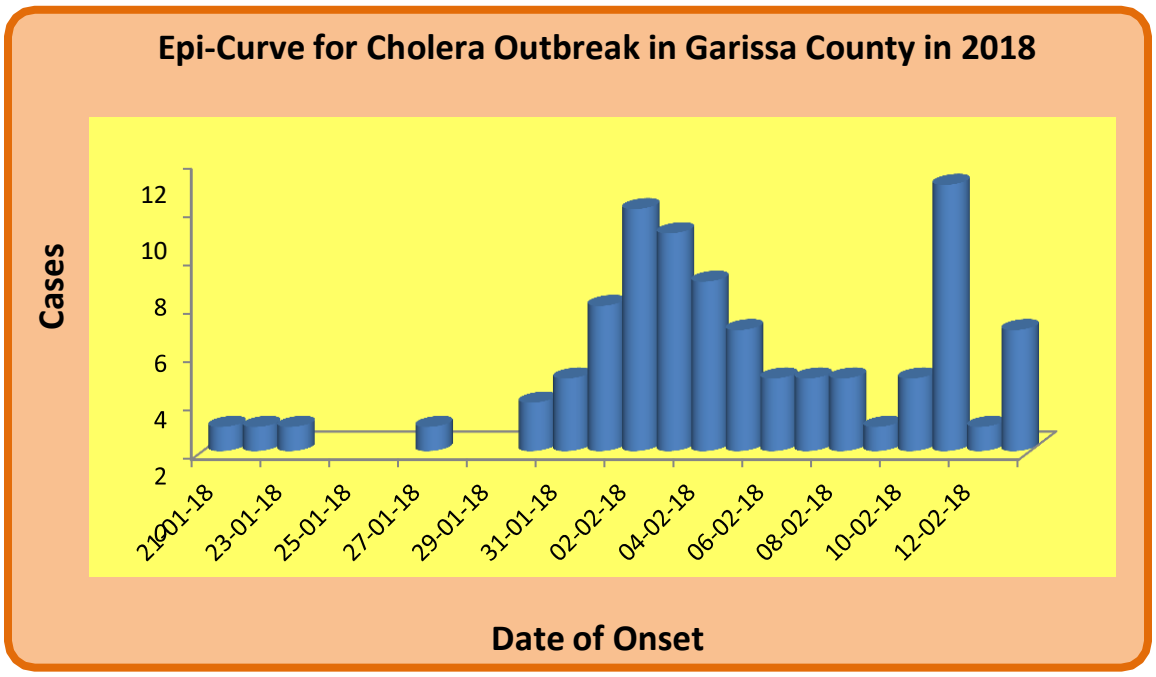
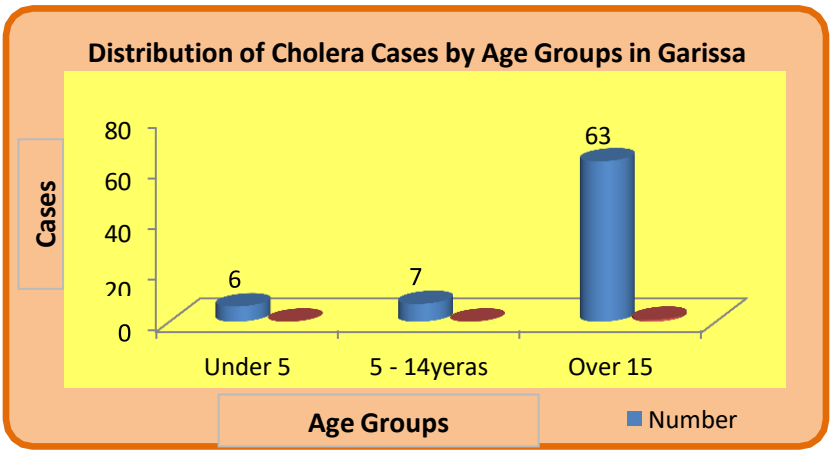


Figure 35: *An Epidemic Curve of the Cholera Outbreak in Garissa County in Jan to Feb2018*

Distribution of Cases by Age Groups



Persons aged over 15 years constitute 83% of all the cholera cases seen in this outbreak.

***Figure 36**: Distribution of Cholera Cases by Age Groups*

Distribution of Cholera Cases by Sub Counties and Gender

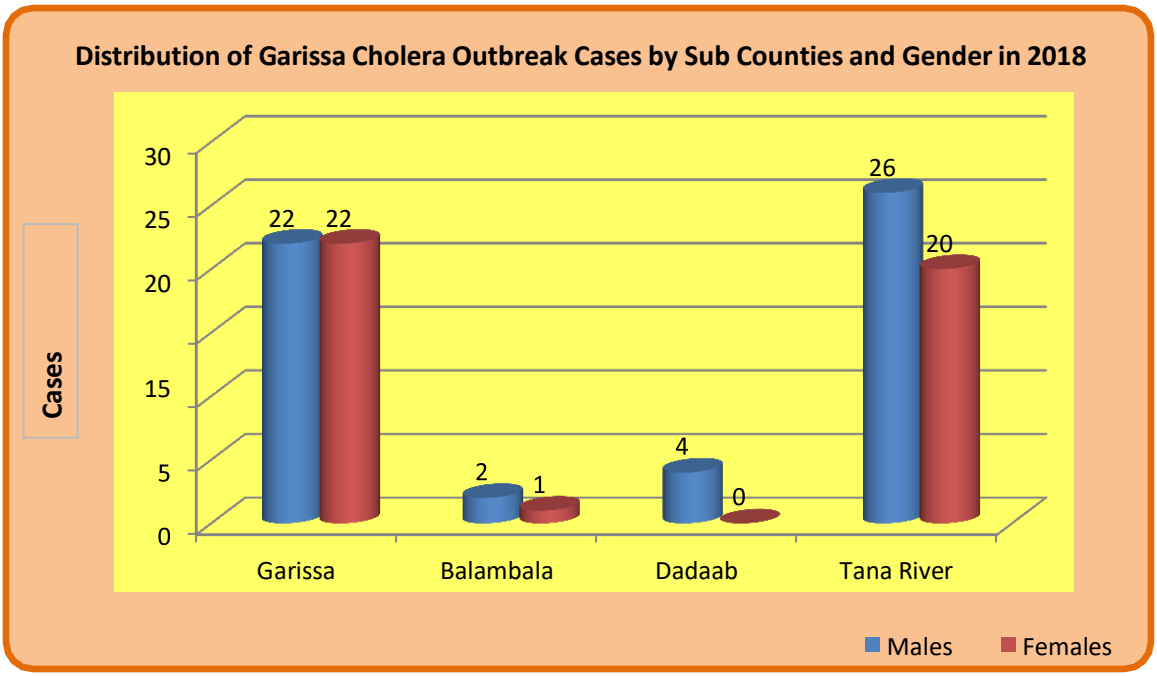


***Figure 37:** Distribution of Cholera Cases by Sub Counties and Gender*

The outbreak has caused cases in Garissa, Balambala and Dadaab Sub Counties of Garissa Countyand Madogo area in Tana River County. In all the affected areas except Garissa, the outbreak presents as a predominantly as a male outbreak but in Garissa both males and females are affected equally.

Both Garissa Sub County and Tana River affected areas are main epidemic foci of the outbreak.

Distribution of Wards/Locations in Garissa Sub County

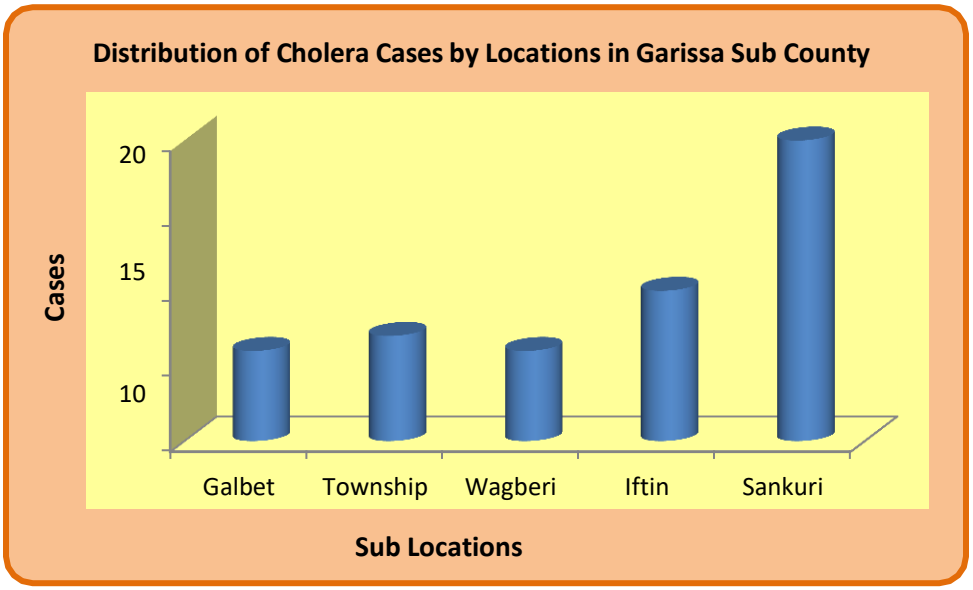


Figure 38: *Distribution of cholera cases by Wards/Locations in Garissa Sub County*

Distribution of Wards/Locations in Tana River Sub County

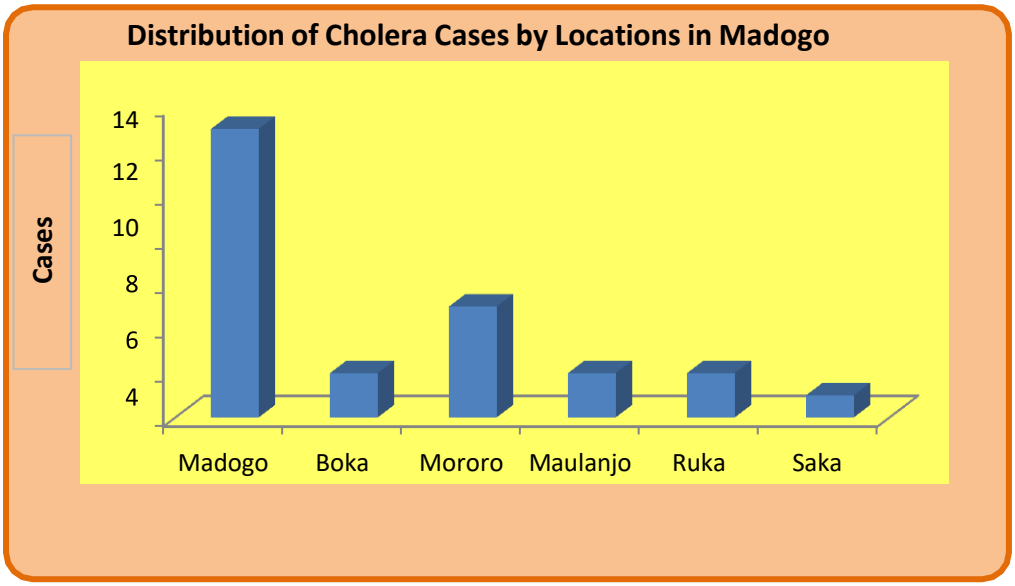


Figure 39: *Distribution of Cholera Cases by Locations in Areas of Tana River County Madogo area accounts for 50% of cholera cases treated in Garissa CTC.*

Assessment of the overall cholera response process

The current outbreak i still demonstrates active transmission in Madogo areas and Garissa SubCounty. The Garissa CRH CTC also remains most active.

Epidemiological Issues of the Outbreak

5.0.1 Garissa remains at risk of continued importation of cholera cases from the neighbouring areas of Tana River County mainly from Madogo area. This area provides a lot of casual and manual workers for the vibrant Garissa economy.

5.0.2 Continued cholera transmission is also feared from possible asymptomatic cases among pastoralists still in the fields with animals.

Case Management Issues

5.0.3 The cholera case management was noted to be facing weaknesses as several challenges were noted that included use of non-recommended IV fluids like normal saline and 5% dextrose, the use of anti -emetics and anti-diarrhoeal formulations.

5.0.4 The assessment also identified that some patients experienced complications including acute renal failure largely due to management of rehydration and perfusion management.

5.0.5 Most stable cholera patients found in the CTC were having some dehydration but were not offered ORS for free will drinking.

5.0.6 Food offered to recuperating Cholera patients was the usual hospital food that patients are unable to cope with. Porridge is the recommended feed.

Challenges with Infection Prevention and Control in Cholera Treatment Centres

5.0.7 The CTC was noticed to have visitors in all sections of the CTC posing a risk of nosocomialtransmission.

5.0.8 Hand washing facilities were not placed at the exit of the patients' rooms to ensure handhygiene compliance.

Health Education

5.0.9 Health education was weak in the CTC especially for the stable patients. In view of inadequate staff, playing a recorded health message would be encouraged and patients encouraged to ask the staff questions for clarification.

Recommendations

6.0 Sustain enhanced surveillance by training health workers in the rural health facilities on acutewatery diarrhoea and cholera case definition.

6.1 Urgently conduct risk assessment in the whole county on cholera importation risks, spread bypastoralists or persistent local transmission.

6.2 Strengthen the role of community health volunteers (CHVs) to promptly report any diarrheal cases and assist patients to reach health facility.

6.3 Enhance food safety targeting eateries used by persons of the low social economic category.

6.4 Plan to urgently conduct update training for health workers on cholera case management and management of cholera treatment centres.

7.0 Conclusion

The team in Garissa Sub County has made good effort to respond to the outbreak and have gained good progress. Considering that there is still cholera transmission, there is need to provide more support to enable both CHMT and Sub CHMTs in Garissa to effectively control cholera.

Annex 7E: List of Stakeholders and Partners for Risk Communication

Ministry responsible for Health
Ministry responsible for Education
Ministry responsible for Agriculture
Ministry responsible for Local Government
Ministry responsible for water supply and sanitation
Ministry responsible for Communications & Information
Ministry responsible for Transport
Ministry responsible for Environment and Forests
Ministry responsible for Tourism
Ministry responsible for Information and Broadcasting
Department of Civil Aviation
National Disaster Management Authority
Agricultural Research Institutes)
Department responsible for Atomic Energy and Nuclear Power
Institutions responsible for chemical events
Department or Institution responsible for Occupational health
Universities and colleges
National Public Health Institutes
Agriculture Research Institutions
Hospitals
Laboratories
Fire department
Police Department
Drug manufacturers
Drug suppliers
United Nations: WHO/ International Children's Emergency Fund (UNICEF), UNAIDS

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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/

INTEGRATED DISEASES SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES FOR REPUBLIC OF KENYA

THIRD EDITION



SECTION 8: MONITORING, SUPERVISION, EVALUATION AND PROVIDING FEEDBACK TO IMPROVE SURVEILLANCE AND RESPONSE.

May 2022

8.0 MONITORING, SUPERVISION, EVALUATION AND PROVIDING FEEDBACK TO IMPROVE SURVEILLANCE AND RESPONSE

8.1 Introduction

Monitoring refers to the continuous tracking of planned activities e.g. prompt delivery of reports, On the other hand, supervision refers to the act of overseeing operations of the surveillance system; while evaluation, assesses whether surveillance and response objectives have been achieved.

Both monitoring and evaluation help to understand if the system has been working effectively. Evaluating information regularly supervisors are able to determine whether surveillance and response objectives have been achieved. Through supervision, supervisors and supervisees work together to review progress, identify problems, determine causes of the problem and develop feasible solutions. Sustainable supervision and feedback have been shown to contribute to improved performance of disease surveillance systems.

This section will describe how to supervise, monitor, and evaluate performance of the surveillance system and specific diseases or public health event control and prevention programs. It will also describe how feedback will be provided to stakeholders. The section will concentrate on core surveillance functions described in the introduction section, and describe how supervision and provision of feedback are key to improving the surveillance and response systems.

Some benefits of monitoring of the IDSR system are:

- Tracking progress of implementation of planned activities and ensuring that planned targets are achieved in a timely manner;
- Tracking progressive improvements in targeted indicators of the quality and attributes of the system, such as timeliness and completeness of reporting
- Identifying problems in the system in order to institute corrective measures in a timely manner;
- Ensuring that all implementers of the systems are held responsible and accountable for their defined activities.
- Ensuring that stakeholders can receive information on performance of the surveillance system.

Some benefits of supportive supervision of the surveillance system are:

- It ensures surveillance tasks assigned are performed according to plan;
- it facilitates correct performance of activities as per set standards;
- It encourages good productivity of surveillance implementers;
- It provides opportunity for guiding, supporting and assisting service providers assigned tasks;
- It Provides an opportunity for corrective measures to be undertaken

Some benefits of evaluating the IDSR system are:

- Ensuring that the surveillance system meets the objectives for which it was formulated;
- Documenting surveillance system status and change in performance;
- Providing evidence as basis on which surveillance objectives, implementation strategy and planned activities can be modified;
- Enabling planning and resource allocation;
- Providing explanations for achievements and failures in the system;
- Providing specific recommendations for improving the system.

NB Use key IDSR attributes to evaluate the system

Some benefits of providing feedback are:

- Reinforcing healthcare workers' efforts to participate in the surveillance system;
- Motivating those who provided data, hence scaling up compliance for reporting;
- Improving quality of data provided by data collectors;
- Enhancing planned public health action;
- Strengthening planning of appropriate actions;
- Strengthening communication and spirit of teamwork.

Section 3 of these guidelines describes how, each month, health staff responsible for surveillance at health facility and county levels review and analyze data that is reported during the month. Conclusions are drawn about the following: timeliness and completeness of reporting from each level, quality of routine prevention and control activities taking place, so that whenever gaps are detected, appropriate action is implemented.

The same information can also be used during supervision to routinely monitor and periodically evaluate: timely reporting of notifiable diseases, conditions /events, outbreak investigations and responses including reporting of aggregate data.

When problems are detected in the surveillance and response system, action can be taken to strengthen it. By providing feedback to health workers for implementing identified corrections, it is more likely that results of desired outcomes will be evident. For example, one may use the monthly monitoring data to do an evaluation at the end of the year, and questions to help carry out an evaluation may include:

a) Are surveillance objectives for existing activities being met?
b) Were surveillance data used for taking public health action?

Did surveillance, laboratory and response activities have an impact on the outcome of health events in the county?

8.2 Identification of targets and indicators

Using indicators is helpful in measuring the extent of achievement for a particular program or activity. Indicators are signs of progress; they are used to determine whether the program/intervention is on course in achieving its set objectives and goal. The achievement is then compared to overall recommended performance standards. Apart from performance standards, there are some disease-specific surveillance indicators that may be used to monitor quality of the surveillance system, e.g., those for AFP and measles.

Indicators are also used to assess performance of the surveillance system, to ascertain whether it is reaching its targets and objectives. For example, a county may have a goal of reaching 100% completeness of reporting by a certain period. An indicator can be developed to measure the proportion or percentage of facilities that are reporting. This proportion is then compared with the desired goal or target, and can be used to evaluate progress and, therefore, quality of a given service or activity.

Use of indicators in accordance with national goals and specific plans

Indicators are used in accordance with national goals and specific plans to improve integrated disease surveillance and response activities in a country.

Indicators selected for use should be relevant to the county's plan for improving surveillance in the current year, and that will provide information the country can use.

Selection of data for measuring indicators

After selecting relevant indicators, specify the numerator and the denominator. For example, if a country's objective is for all health facilities to keep trend lines for selected priority diseases, the numerator and denominator are defined as follows:

Indicator*:* The proportion of health facilities in the country that keep trend lines for priority diseases.

Numerator: The number of health facilities that keep trend lines for priority diseases.

Denominator: The total number of health facilities in the country.

Ensuring availability of data sources

Each level should ensure that the level it supervises has the following sources of data available. For example, the national level has data available from sub-counties and county levels to conduct required monitoring activities.

Table 18: *Minimum Water quantity needs calculations*

Data source	**Community Level**	**Health Facility**	**Sub-county**	**Regional**	**National**
Monitoring chart for tracking indicators (Sample charts are in **Annex 8A**.)	X	X	X	X	X
Outpatient register		X		X	
Inpatient register		X		X	
Laboratory register		X		X	
Health facility reporting forms		X	X	X	
Case-based and/or line listing reporting forms	X	X	X	X	X
Outbreaks investigations reports		X	X	X	X
Log of suspected outbreaks and rumors	X	X	X	X	X
Supervisory reports from health facility, sub-county, /region, national	X	X	X	X	X
Laboratory reports/results received		X	X	X	X

8.3 Monitoring of core functions of IDSR at sub-national level

Indicators for core functions measure processes and outputs from the surveillance system. In the introductory section, core surveillance functions have been described and so one may refer to the table of core surveillance functions for each level. This sub-section describes key indicators at various levels, in relation to core functions. Here, core functions are clearly described, but further detail of said functions is provided in **Annex 8A-D**, where indicators for each core function are available.

The core functions are:

(i) **Identifying cases and public health events**

Case detection is the process of identifying cases and outbreaks. Case detection may be done through the formal health system, private health systems or community structures. Case definitions and a functioning rumor-verification system are vital for case and outbreak detection. Once a case has been identified, it has to be recorded in a register (outpatient or inpatient register, clinical cases register etc.).

Monitoring indicators should be established to monitor this core surveillance function. Examples of indicators could be:

a) 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 registration.
b) Proportion of health facilities using standard case definitions (SCD) to identify IDSR priority diseases.

Reporting of cases and events

Reporting refers to the process by which surveillance data move through the surveillance system from the point of generation to the next level.

It also refers to the process of giving account of suspected and confirmed outbreaks as well as notifying under the IHR 2005 of PHEIC, using the decision instrument mentioned in **Section 2**.

There may be different reporting systems, depending on the type of data and information being reported, purpose and urgency of relaying data/information, and where the latter is being reported.

Timely submission of data is critical for prompt outbreak detection and response to prevent widespread outbreaks. Health facilities should submit reports on time, as per the national guidelines.

Examples of indicators for this core surveillance function include:

a) Proportion of complete surveillance reports submitted on time to the next level.
b) 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.

Analysis and interpretation of data

Analysis of data is the systematic process of examining data to generate relevant information for timely and appropriate public health action.

Surveillance data should be analyzed routinely and the information generated should be used for appropriate public health actions.

a) Capacity for routine data analysis and interpretation should be maintained at all levels.
b) Examples of indicators which can be used to monitor analysis include:
c) Proportion of priority diseases for which a current graph is available.
d) Proportion of counties that report laboratory data for diseases under surveillance.

Investigation and confirmation of suspected cases/outbreaks

Case/outbreak confirmation depends on the epidemiological and laboratory capacity at all levels.

Capacity for case confirmation is enhanced through improved referral systems, networking and partnerships. The required capacity for confirmation includes; appropriate specimen collection, packaging, transportation, storage, and testing.

Internal and external quality assurance mechanisms are important elements for case confirmation; they help to ensure the validity and reliability of test results.

Examples of indicators for monitoring this core function include:

a) Proportion of suspected outbreaks of epidemic-prone disease notified to the appropriate level within 24 hours of crossing the epidemic threshold.
b) Proportion of investigated outbreaks with laboratory confirmation.

Preparedness

Epidemic preparedness refers to the existing level of preparedness for potential epidemics, and includes availability of preparedness plans; stockpiling; designation of isolation facilities; and setting aside resources for outbreak response.

Examples of indicators which can be used to monitor preparedness include:

a) Proportion of health facilities with stock of key items (e.g., PPE, specimen collection kits, case-investigation forms, intravenous fluids, treatment kits) for response.
b) Proportion of counties with emergency preparedness and response plans.

Response

Public health surveillance systems are only useful if they provide data for appropriate public health response. For an early warning system, the capacity to respond to detected outbreaks and emerging public health threats needs to be assessed. This can be done, following a major outbreak response and containment, to document the quality and impact of public health response and control.

Some examples of indicators for monitoring response include:

a) Case-fatality rate for the epidemic-prone disease reported.
b) Proportion of counties with functional Rapid Response Teams (RRT).
c) Number of outbreaks responded to within 24-48hours of notification to the next level

Providing feedback

Feedback is a process in which the outcome of an action is returned (fed back) to modify the next action. It is an important function of all surveillance systems at all levels.

(**Item 8.5.2** of this section provides a thorough description of types of feedback which may be used to improve performance of IDSR.)

Some examples of indicators for feedback include:

a) Proportion of counties producing regular epidemiological bulletins.
b) Proportion of feedback bulletins/reports received from national levels (when evaluating feedback from national to subnational levels).
c) 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, WHO AFRO will measure the overall performance of core functions of IDSR in the countries, by using 16 key performance indicators explained in **Annex 8I.**

8.4 Monitoring quality of IDSR activities at sub-National levels

The quality level of the surveillance system is defined by attributes such as:

- completeness
- timeliness
- usefulness
- sensitivity
- positive predictive value (PPV)
- specificity
- representativeness
- simplicity
- flexibility
- acceptability
- reliability

Periodically, quality of the surveillance system should be assessed, based on these indicators.

Surveillance attributes can be evaluated using quantitative and qualitative methods.

Monitoring of timeliness and completeness of monthly reporting

An important indicator of a good-quality reporting system is the timeliness and completeness of reporting at each level. In the event reports are sent and received on time, the feasibility of detecting a problem and conducting prompt and effective response is greater. However, if reports are incomplete, then the information cannot describe the problem, and if they are late, or not submitted at all, aggregated information for a given county (or any other administrative area) will not be accurate. In such an event, outbreaks can go undetected, and opportunities to respond to public health problems will be missed.

Timeliness of Reporting

The single most important measure of timeliness is whether data is/are submitted in a timely manner to begin investigations and implement control measures. Timeliness of reporting should be measured against set national reporting standards. Important aspects of timelines of reporting in a communicable disease surveillance system include:

- timeliness of immediate notification, i.e., within 24 hours;
- timeliness of weekly reporting; and
- timeliness of monthly reporting.

Monitoring timeliness of detection and notification of immediately reportable diseases or events

Key considerations for monitoring timeliness of detection and notification include;

a) Monitoring how well a system is able to detect immediately notifiable diseases or events monitoring the interval between the onset of the first known case and when the case was seen in the health facility if this interval is too long, it will seriously affect the health outcome of individual patients and will alter the spread of outbreak.
b) Other intervals to monitor for detection of immediately reportable diseases include, monitoring reporting from community to health facility (within 24 hours of onset of illness) and from health facility to sub-county (within 24 hours), and from the time threshold is reached to the time of concrete response (within 48 hours).

Monitoring the timeliness of weekly reporting

Surveillance system effectiveness can easily be assessed each month, by/through analyzing routine surveillance data. A monitoring tool, such as the one in **Annex 8G**, may be used to monitor timeliness at all levels.

For example:

a) use the record of reports received to measure how many reporting units submitted reports for a given week/month against the number of units expected to report;
b) identify which reporting units have reported; and
c) measure how many monthly reports were timely.

Note: Ensure compliance with national IDSR reporting guidelines.

8.5 Completeness of reporting

Completeness in surveillance can have varying dimensions and may include the following:

Completeness of reporting sites:

Completeness of reporting sites refers to the proportion of reporting sites that have submitted a surveillance report, irrespective of the time that 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;

In addition, it can trigger further investigation for reasons of poor performance, and possibly help to identify solutions to correct such performance.

Completeness of case reporting

Completeness of case reporting refers to the match between the number of cases reported and the actual number of cases. This can be obtained by comparing the number of notifiable conditions reported to the next higher level (over a period of time), with the number of cases recorded in the patient register, over the same period.

Completeness of surveillance data

Completeness of surveillance data is the match between the expected data requirement and what is reported. This indicator will ensure that:

- All data on each of the required variables in a surveillance form is collected, registered, validated and compiled
- Challenges that lead to missing variables are resolved.
- Mainstream level of performance that minimizes missing variables

Identify challenges and take action

The following should be done to resolve identified challenges:

- Where reporting unit has not submitted a report the surveillance focal point should be contacted to identify the cause of the problem and develop solutions in consultation with the officer concerned.
- Develop a plan to systematically address challenges identified

8.6 Report timeliness and completeness to other levels

The reporting units should ensure all data elements are complete and reported in a timely manner. This will help the other levels to understand the situation much more clearly, and to evaluate quality of the data that is being sent. For example, if the report to the national level states that two cases of measles were detected during the month, it should also include information about the number of health facilities that have reported. It will make a difference to the other levels, when they evaluate the information, if the 2 cases occurred with only 20%, rather than 100% of the units reporting.

8.7 Monitoring other attributes for assessing quality of the IDSR system

Key attributes are used to assess the quality of a surveillance system. Some of the key attributes are summarized in the table below. There are additional attributes for performing periodic evaluation assessments (**Table 8.2).** Readers are referred to the updated framework for evaluating surveillance systems for a complete list of attributes.

Table 19: *Summary of attributes for assessing quality of the 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 contribution to the performance measures e.g., Usefulness of surveillance data in an early warning system	Is the system e.g., the early warning system able to detect outbreaks early? Example: A useful system over time must demonstrate that a certain intervention which has been instituted has worked. In a malaria program, data collected over time might show if ITN has 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 simple? e.g., is the standard case definition understandable? Does it have multiple reporting structures? Example: A health worker has to report maybe to the sub-county 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	How is the participation rate of health facilities? How is the completeness of reports? Example: 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? **Note:** A good system should be able to cover all 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.	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.
Reliability	Reliability is a property of a measure that refers to its precision, or the degree to which multiple observations of a given phenomenon yield identical results.	For example, an instrument reliability means that the instrument consistently reflects the construct that it is measuring by giving the same score if used over and over
Sensitivity	Is the ability of surveillance to detect the health problem that it is intended to detect	The number of Non-Polio AFP cases which is 2/100,000
Flexibility	Refers to the ability of the method used for surveillance to accommodate changes in operating conditions or information needs with little additional cost in time, personnel, or funds	The ease of accommodating any variance of concern in an existing surveillance system
Completeness	Data completeness refers to the comprehensiveness or wholeness of the data. There should be no gaps or missing information for data to be truly complete.	Proportion of complete surveillance reports submitted to the the next level
Timeliness	Refers to the availability of data rapidly enough for public health authorities to take appropriate action.	The proportion of weekly reports that were submitted on time

Predictive Value Positive	Predictive Value Positive is the proportion of reported or identified cases that truly are cases, or the proportion of reported or identified epidemics that were actual epidemics.	The proportion of reported cases in a surveillance system with a positive lab result

8.8 Monitoring quality of Surveillance activities at community level

Monitor events from community-based surveillance

Community is the first level of healthcare system in the country. Monitoring CBDS and CEBS activities is as important as monitoring health facility, sub-county, and County level activities. Community health volunteers, community health assistants, community health officer and any other appointed for the implementation of community-based surveillance involved in the system must understand the benefit of the system, and know that their input is of value and can assist in improving or adapting the system to work better for the community.

Qualitative feedback from volunteers and the community is an essential part of contextualizing and understanding quantitative CBS data. Establish as system to capture community members' and community health volunteers' feedback which may involve one or more of the following approaches:

- Regular and open community meetings where all issues are noted and acted upon;
- Focus group discussions with community health volunteers' and/or community leaders/members;
- Suggestions and complaints box(es) for use in the community;
- Appointment of a community representative(s) to gather feedback and complaints; and
- Feedback platforms including flyers, mobile phones, which may be used by community health volunteers to give feedback.

There should also be community-driven data analysis and monitoring, whereby communities are supported to undertake their own data analysis. Communities may be provided with basic material to record the type of occurrences they report, as well as resulting actions, and also record outbreaks or events that occurred but did not trigger an alert, so that triggers can be adjusted. Some performance indicators listed below (**Table 21),** are examples of indicators for community-based surveillance.

Table 20: *Examples of indicators for community-based surveillance*

Indicator	Definition	Data source
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	CBDS reports
Proportion of alerts responded to within 24hr-48hr	**Numerator:** Number of alerts responded to within 24hr-48hr **Denominator:** Total number of alerts detected from CBDS focal person NB: responding to alerts is defined as visit by the nearby health facility for case investigation, case management, health promotion, community sensitization and distribution of materials (Must be defined according to response plan)	CBDS reports and response reports
Proportion of alerts which are true events	**Numerator:** Number of true events detected **Denominator:** Total number of alerts reported	CBDS reports and response reports

8.9 Support Supervision and feedback for Improving IDSR activities

Supportive supervision

Supportive supervision is a process of helping to improve work performance. Supervision is not an inspection. Rather, good supportive supervision aims to sustain good-quality services, and not to find what is wrong with the latter.

In a good supportive supervision system, supervisors and health professionals work together to review progress, identify problems, decide what has caused the problem and develop feasible solutions.

Steps of conducting supportive supervision

a) Ensure availability of job descriptions and standard operating procedures (SOPs) for surveillance staff

Job descriptions and SOPs are the basis for conducting supervision and assessing performance. Review job descriptions and SOPs of health staff who have a role in the surveillance and response system.

Make sure that a job description states:

- the surveillance tasks to perform;
- to whom the staff person reports; and

- a defined scope of work, as well as SOPs that are adhered to in practice.

(b) Prepare a supervision plan

Include surveillance and response targets in the overall plan for supervision

Monitor health staff performance at each level. Monitoring should be done monthly at the all levels.

Supervisors should prepare and avail supervision schedules.

Ensure logistics for supervisory visits and surveillance activities are available.

Include in the overall plan, other reporting sites in supervision of county or sub-county surveillance activities, such as private health centers, other clinics (of schools, uniformed forces etc.), medical centers and community reporting sites

(c) Use a supervisory checklist

Each reporting unit has unique problems and priorities that require specific problem solving and corrections. A predetermined checklist will help to systematically evaluate the reporting unit. The items listed in a graduated checklist (**Annex 8H**) are some of the examples of achievements that a health facility can be evaluated on. Always refer to **Annex (8 A–D**) and look for additional examples to evaluate for each core surveillance function at the reporting unit. For example, when the facility has achieved one objective (using standard-case definitions consistently), work with reporting unit staff to include the next indicator or item for monitoring performance, such as using thresholds for action. Revise the supervisory checklist accordingly. Use it during future visits to help health staff in monitoring their activities and progress towards an improved system.

During the visit, use a checklist to monitor how well health staffs are carrying out the recommended surveillance functions. For example, a county surveillance officer visiting a health facility for a supervisory visit should verify the following:

Identify	Check the health facility register to see if the case diagnoses correspond to the recommended standard case definition
Register cases	Check the register to see if all the columns are filled out correctly
Confirm cases	Compare the laboratory records for priority diseases/ conditions with the number of cases seen in the clinic for the same period of time.
Reporting	Review reports for the most recent reporting period. Compare the number of cases of priority diseases/conditions that were reported with the number recorded in the register. Check the date on which the case report was sent against the date recommended for sending the report. Check the reports to make sure they are complete and accurate.
Review and analyze data	Verify that trend lines are prepared and kept up-to-date for priority diseases/ conditions. Ask to see the "Health Facility Analysis Book,"/ charts or the electronic

	health facility data in your sub-county. Look to see if the trend lines for selected diseases are up to date.

Note: A sample supervisory checklist is in **Annex 8H** at the end of this section. Additionally, **Annex 8A–D,** describes details of core surveillance functions at health facility level and can be used for guidance in supervision of the health facility. Questions to be answered during a supervisory visit may be adapted or modified to meet specific concerns, and determine the extent of progress towards an integrated surveillance system within a health facility.

(d) Conducting supervisory visits

Conduct regularly-scheduled supervision at all levels (national to county; county to sub county/facility; sub county/facility to community) to ensure that:

a) appropriate supplies (e.g., forms, job aids) and required standard-case definitions/ guidelines are available
b) public health staff know how to identify and use standard-case definitions to record suspected cases of priority diseases seen in their health facility
c) priority diseases are recorded in the case register, according to the case definition;
d) some data are analyzed in the health facility to identify thresholds to take action both for routinely reported priority diseases (disease of public health importance) and case- based diseases (epidemic-prone diseases, and diseases targeted for eradication or elimination);
e) reported cases of diseases, conditions, or events for which a single case is a suspected outbreak or public health emergency, are investigated promptly (for example a single confirmed case of cholera or polio, maternal death, MDR/XDR TB)
f) response takes place when outbreaks or other public health events are confirmed, or when problems are identified in routine reporting
g) response actions are monitored and action is taken by the health facility to improve surveillance and readiness for outbreak response.

During the visit:

a) provide feedback to health staff. Let them know what is working effectively and what is not. Also give feedback on how previously reported data was used to detect outbreaks and take action to reduce illness, mortality and disability in the county. If improvements are needed, discuss solutions with staff;
b) provide on-the-job training, as needed, if a problem is identified. For example, during review of the analysis workbook, the supervisor noted that case-fatality rates were not correctly calculated. supervisor, therefore, meets with the health staff who are in charge of calculation, and reviewed steps for calculating the rate with the staff in question;
c) follow up on any request for assistance, such as for emergency response equipment or supplies; if solution to a pre-existing problem was identified during a previous visit, verify how well the

solution has been implemented. Find out if problems are still occurring and modify the solution, if necessary;

d) ensure that both supervisor and supervisee(s) sign the supervision reports and also indicate dates on when supervision was done.
e) Write a report on the supervisory visit. Include in the report, achievements that were identified during the visit; state follow-up actions that were planned with the health staff, and any requests for additional resources, funds or special problems.
f) Use supervisory visits to improve surveillance activities in the sub-county.

Visits by surveillance supervisors are good opportunities to discuss and improve disease control activities. For example, if a national malaria control officer visits the county, the reason why inpatient malaria deaths have not been declining could be discussed with them. Questions may also be asked about additional ideas or resources that the malaria control program could provide.

8.10 Providing feedback for improving IDSR activities

In most cases, health facilities and sub-counties reliably report surveillance data to the next level as required. When sub-county, county or national managers receive data, they should provide feedback to the respective levels. The purpose of feedback is to reinforce health workers' efforts in participating in the surveillance system. Another purpose is to raise awareness about certain diseases and any achievements made by disease-control and prevention projects in the area.

Feedback is classified as:

- supportive when it reinforces and acknowledges good performance, and
- corrective, when a change in behavior and improvement is required. It also strengthens the communication and spirit of team working. Feedback should be both vertical and horizontal targeting different audiences as provided by different levels in the health system.
  Effective feedback should be:
- specific to ensure that recipients understand 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 recipients will remember activities that should be sustained or corrected.

If the facility does not receive information from the next level about how data were used or what data meant, health staff may think that their reporting is not important. As a result, future reporting may not be reliable, since health staff will not know whether the information, they sent to other levels was important or necessary. Their understanding of the health situation may be good at their own level, but they may not have the needed information for characterizing the situation at sub-county, county or national level.

At community level, communication includes building relationships, communicating and coordinating with other community key informants, resource persons and existing formal and informal networks for information dissemination and reporting. There exists real time feedback mechanism by use of electronic reporting platforms from where data is analyzed and presented as it is entered. This feedback system is limited to data presentation and comparison overtime. The higher levels are expected to deduce information, package and disseminate to all stakeholders and partners.

Feedback may be in writing, such as a monthly newsletter/bulletin, emails, social media, SMS, virtual meetings or periodic official information like publications, or it may be given verbally through telephone calls or periodic meetings. Although this approach focuses on county-level feedback, this can also be applied at health facility and national levels. Feedback may also be given during supportive supervision by the sub-county level to health facilities, or by the national level to counties. Supervision can be on performance of health programs and feedback can be provided during such supervisory visits. Whichever method used to give feedback, efforts should be made to document and file the feedback given to create a point of reference in future.

Developing and disseminating routine epidemiological bulletins

Feedback for IDSR reportable diseases should be provided periodically i.e., via weekly, monthly or quarterly epidemiological bulletins or newsletters. Bulletins and newsletters provide information on disease patterns and achievement of program objectives in the county/country. These are usually brief and are important for reaching policy-makers, legislators, development partners, program technical staff and stakeholders. At a minimum, they contain:

- a summary table with the number of reported cases and deaths, to date, for each priority disease;
- Descriptive analysis for selected diseases by person, place and time.
- 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 creating real intelligence regarding an event. (Annex 8I shows examples of an epidemiological bulletin).

Developing information summary sheets

An information summary sheet is a report that presents data and its interpretation in a table or other graphic format. For example:

- At a staff meeting, or during a supervisory visit, give a verbal report or comment about data that was reported by the health facility during a given period.
- Display data in a simple table. Sit with health staff and show them the data. Discuss about the likely conclusions that may be drawn from said data. Consider conclusions not only for the health facility, but also for the county as a whole.
- Prepare a single sheet with a simple table that shows how data reported for a given period are different from data reported for some other period or target population.

For instance, show the number of cases of diarrhea with dehydration in children aged less than 5 years, from the same period last year, and compare them with a corresponding period in the current year, after a safe water project was implemented in a high-risk area. The summary sheets may be used to support requests for additional funds.

Developing a sub-county newsletter

The purpose of a county newsletter is to provide shorter updates than those provided in a more detailed feedback bulletin. The county newsletter is useful for informing and motivating health staff. The target audience for a newsletter could be health staff in the county. The newsletter may be 2 to 4 pages long, and produced simply with a computer- entered or typewritten text.

Examples of articles that could be carried in a newsletter are:

- summary of national or county data for a given priority disease;
- report of progress towards a specific public health target;
- report of specific achievements towards public health by an individual health worker or a group of health workers; and
- description of special events or activities (for example, a change in market day).

8.11 Evaluate effectiveness of performance of the IDSR System

The purpose of evaluating a surveillance system is to assess its effectiveness and response in terms of timeliness, quality of data, preparedness, case management, overall performance and using indicators to identify gaps or areas that could be strengthened. A comprehensive evaluation thus includes the surveillance system and, if already available, the IDSR Implementation Plan. Evaluation of the surveillance system should:

a) show the extent to which desired outputs and outcomes are achieved;
b) provide explanations for achievements, disparities and failures;
c) document quality of the system and demonstrate any changes in its performance; and
d) the extent to which overall surveillance objectives are achieved.

Depending on the development status of surveillance system in a country, select evaluation indicators that will provide information relating to country's priorities and objectives for the year.

Use IDSR implementation plan, with clearly defined evaluation objectives, to conduct mid-term and end-of-term evaluations. surveillance systems should be evaluated every 2, 3 or 5 years.

Key steps in evaluation include:

Defining objectives

Objectives should be simple, measurable, attainable, realistic, and time-bound (SMART).

Developing evaluation indicators

Indicators should be identified for each of the evaluation objectives, and should be harmonized, as much as possible, with monitoring indicators.

Developing evaluation methods and tools

Based on these indicators, an evaluation protocol should be developed describing the evaluation process, methods, target group, data sources, data collection methods, and plan for data analysis and utilization.

Identifying people to conduct evaluation

Determine who evaluators will be; people within the county, people outside the county, or a mixture of people including partners/donors. Depending on the scope of evaluation, its purpose and available resources, a decision should be made during the planning stage on who should undertake evaluation.

To ensure objectivity and transparency during the evaluation process, a blend of self-internal evaluations and external evaluations should be conducted periodically.

Conducting the evaluation

Compiling and organizing monitoring data and other results

Using routine surveillance data for monitoring

The sub-County surveillance Coordinator or other designated officer summarizes routine surveillance and outbreak data received from all health facilities in the sub county and enter in the national repository (KHIS). Health facilities with credentials enter the data directly to KHIS. Not all surveillance data is available in the KHIS (outbreak reports), there is therefore need to explore other data sources for comprehensive monitoring

The national level will then;

- compile surveillance data received from all counties and identify undetected epidemics
- Follow up with areas where reporting continues to be unreliable or does not happen at all.
- Provide technical assistance to Counties to improve the situation
- Provide feedback to all levels

Use a monitoring chart, such as the one on the **Annex 8J**, to monitor performance of indicators at every level. Share these results with staff at all levels of IDSR management. Identify successes and failures and help health staff to maintain positive progress. Discuss possible issues causing negative performance and how best to address them. Seek assistance of the next level, as needed including obtaining additional help or resources.

Gather data from several sources. For example:

a) Gather monthly summaries of cases and deaths reported to the county, spot maps, and other analysis results performed by the county.
b) Collect any results from special surveys or studies that were done in the county over the previous year.
c) Include case investigation forms and reports of outbreak response activities that took place in the county.
d) Gather summary information from the community and also from health staff.

Analyzing data

As summary data for the year is evaluated, the following should be considered:

a) Were the reports complete, on time and accurate?
b) What were significant changes in disease or event trends during the year? If an increase occurred, was the problem identified?
c) If additional cases are still occurring, why are they occurring? Where are they occurring?
d) Were appropriate and timely actions taken in response to the surveillance data?
e) Were supervisory visits conducted as planned and follow-up tasks carried out as planned?
f) Did the stakeholders (e.g community, partners, administration) feel that response activities were successful?
g) Were staff requests and suggestions about services or surveillance taken into consideration during the response?
h) Were appropriate measures taken to prevent future similar events?

Identifying challenges and their causes

Find out what caused the difference between what was planned and what actually occurred. If challenges were discovered, consult with the county team and health facility personnel to determine the root causes and potential solutions.

Update plans for improving the IDSR system

In the sub-county and county plans, include successful activities that should continue. Also, include feasible solutions selected as a result of analysis of the year's annual evaluation. Plan to implement the solution. For example:

- State the new activity and its objectives.
- Specify 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 logistics for the new activity (equipment, personnel, transportation, resource allocation).

Provide feedback to health facilities about the evaluation

Provide a report and give feedback to health facilities and others in the county about results of the evaluation activity. State 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; and
- recommended solutions and prioritized activities for improving surveillance and response in the county.

Annexes to section 8

Annex 8A: IDSR core surveillance indicators for health facility level

Annex 8B: IDSR core surveillance indicators for Sub-County level

Annex 8C: IDSR core surveillance indicators for County level

Annex 8D: IDSR core surveillance indicators for the national level

Annex 8E: Monitoring chart for performance of IDSR indicators at health facility level

Annex 8F: Monitoring chart for performance of IDSR indicators at Sub Count, county, or regional level.

Annex 8G: Sample form for recording timeliness and completeness of monthly reporting from health facility to sub-county level

Annex 8H: Checklist for supervising surveillance and response activities at health facility

Annex 8I: Sample weekly and monthly public health bulletin

Annex 8J: Indicators for monitoring performance of IDSR core functions

Annex 8A: Indicators for monitoring IDSR core functions at health facility level

Identify	Availability of Standard case definition (SCD) and IDSR forms/registers Numerator: Total number of notifiable diseases (n=19) Denominator: Number of SCDs at the health facility	Correctly identifying and filling cases/events	Health facility noticeboard, records, booklets and in charge	100% of all notifiable diseases (n=19)	Quarterly
	Existence of a mechanism to capture unusual or public health events from non-routine sources (for example social media platforms) **Numerator:** N/A **Denominator:** N/A	Measure the ability of the system to capture unusual events	Interviews Health facility alert desk for suspected outbreaks Event based alert log (physical or electronic)	100%	Daily
Reporting	Proportion of complete surveillance reports submitted to the sub-county (completeness) **Numerator:** Number of complete surveillance reports submitted to the sub-county **Denominator:** Total number of reports expected from the health facility	The practice of health facilities in submitting complete surveillance reports to the next level	Weekly 033b HMIS forms at facility Routine summary reports	100%	Weekly
	Proportion of surveillance reports submitted on time to the sub-county (timeliness) **Numerator:** Number of surveillance reports submitted on time to the sub-county **Denominator:** Total number of reports expected from the health facility	The practice of health facilities in submitting timely surveillance reports to the next level	Weekly 033b HMIS forms at facility Routine summary reports	90%	Weekly
	Proportion of cases of priority diseases for case- based surveillance reported with case-based forms or line lists. **Numerator:** Number of cases of priority diseases selected for case-based surveillance reported with case-based forms or line list	Measures reporting of surveillance data with detailed information to use for further analysis	Routine summary reports and case-based or line listing reports	80%	Weekly

	Denominator: Total number of cases of diseases selected for case- based surveillance that occurred in the health facility				
Analysis and Interpretation	Proportion of priority diseases/ conditions for which a current line graph is available. **Numerator:** Number of priority diseases for which a current line graph is available. **Denominator:** Total Number of priority diseases/conditions (n=19)	Measures the practice and capacity to analyze surveillance data	Facility notice board	80%	Weekly
	Proportion of priority diseases for which an updated spot map is available. **Numerator:** Number of priority diseases for which an updated spot map is available. **Denominator:** Total Number of priority diseases	Measures the practice and capacity to analyze and interpret surveillance data	Facility notice board	80%	Weekly
	Proportion of priority diseases for which there is current lab data analysis (if a health facility has a laboratory) **Numerator:** Number of priority diseases for which a current lab data analysis is available. **Denominator**: Total Number of priority diseases (n=19)	Evidence of routine laboratory data analysis and interpretation	Laboratory register	80%	Weekly
Investigation and confirmation of suspected outbreaks	Proportion of suspected outbreaks of epidemic prone disease and other PHE notified to the sub-county level within 24 hours of surpassing the epidemic threshold **Numerator:** Number of suspected outbreaks of epidemic prone diseases notified to the sub-county within 24 hours of surpassing the alert threshold **Denominator**: Total number of suspected outbreaks of epidemic prone diseases in the health facility	Measures early detection and timely reporting of outbreaks	Health facility log of suspected outbreaks and alerts	80%	Monthly

	Proportion of specimens from suspected cases collected within 24 hours of alert **Numerator:** Number of suspected cases for which samples were sent within 24hrs **Denominator:** Total number of suspected cases	Measure capacity to Refer samples in a Timely manner	Laboratory register, OPD registers	80%	Monthly
	Proportion of samples of suspect cases whose lab test results are returned within predetermined turn- around-time (TAT) **Numerator:** Number of samples of suspected cases whose lab test results have returned within the predetermined TAT **Denominator:** Total number of samples of suspected cases sent to the lab	Measures the functionality of the specimen referral network and the reference lab functionality	Lab register, Results Dispatch System (RDS)	80%	Monthly
Prepare	Availability of prepositioned key supplies for emergency response (see kit) *** **Numerator:** N/A **Denominator:** N/A	Measure preparedness of a facility to respond to PHEs	H/F Inventory (Stock cards/ stock book) Observation	N/A	Monthly
	Availability of All hazard's emergency preparedness and response plan **Numerator**: N/A **Denominator:** N/A	Measure preparedness of Health facility to respond to PHEs	Health Facility in Charge		Annually
Respond	Availability of a functional Public Health Emergency Management Committee **Numerator:** N/A **Denominator:** N/A	Measure ability to respond at health facility level	Minutes from Health Facility records		Quarterly

	Case fatality for each epidemic- prone disease reported **Numerator:** Number of deaths from each of the epidemic prone diseases	Measure response activities (early treatment seeking behavior and quality of healthcare services)	Routine reports and outbreak investigation	Depends on disease	Monthly

	Denominator: Number of cases from the same epidemic prone diseases				
	Attack rate for each epidemic- prone disease reported **Numerator:** Number of new cases detected **Denominator:** Population at-risk	Measure response activities	Routine reports and outbreak investigation	Depends on disease	Monthly
	Availability of IPC measures in all health facilities including a holding area **Numerator:** N/A **Denominator:** N/A	Measures the ability to prevent nosocomial infections	Observation		Quarterly
	Availability of an isolation facility in all hospitals **Numerator:** N/A **Denominator:** N/A	Measures the ability to effectively manage highly infectious patients	Observation	100%	Quarterly
	Proportion of HCW trained in IPC in last 12 months at the facility **Numerator:** Number of HCW trained in IPC in last 12 months at a facility X **Denominator:** Total number expected to be trained	Measures the ability to prevent nosocomial infections	Training reports	100%	Annually
Provide Feedback	Community feedback sessions at least once quarterly **Numerator:** N/A **Denominator:** N/A	Measures continuous community engagement	Community feedback reports		Quarterly

	Proportion of feedback bulletins/reports received from the next higher level **Numerator:** N/A **Denominator:** N/A	Presence of a feedback mechanism	Observation		Quarterly

Annex 8B: Indicators for monitoring IDSR core functions at the sub-county level

IDSR Core Function	Indicator	Purpose	Source of information	Target	When to be done
Identify	Proportion of health facilities with Standard case definition (SCD) **Numerator:** Number of HFs with SCD **Denominator**: Total number of all HFs	Correctly identifying and filling cases/events	Checklist for the in charge at the H/Fs	100%	Quarterly
	Proportion of health facilities reporting information using EBS/eIDSR Numerator: Number of HFs reporting information from EBS/eIDSR Denominator: Total number of all HFs	Measure the ability of the system to capture unusual events	Routine summary reports and supervisory reports/eIDSR system	80%	Quarterly
	Proportion of health facilities including hospitals with standardized registers and HMIS forms **Numerator:** Number of HFs with registers and HMIS forms **Denominator:** Total Number of all HFs	Measure the availability of registers and HMIS forms	Checklist for the in charge at the H/Fs	100%	Quarterly
Reporting	Proportion of health facilities including hospitals submitting IDSR reports to the sub-county **Numerator:** Number of health facilities that submitted surveillance reports to the sub-county **Denominator:** Total Number of health facilities in the sub-county	Measures the completeness of submission of surveillance reports	Monitoring chart for timely submission of report/DHIS2	80%	Weekly
	Proportion of health facilities including hospitals submitting IDSR reports on time to the sub-county **Numerator:** Number of health facilities that submitted surveillance reports on time to the sub-county **Denominator:** Total Number of health facilities in the sub-county	Measures the timeliness of submission of surveillance reports	Monitoring chart for timely submission of report/DHIS2	80%	Weekly

	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. **Numerator:** Number of cases of diseases targeted for elimination, eradication, and any diseases selected for case-based surveillance reported with case-based forms or line list	Measures reporting of surveillance data with detailed information to use for further analysis	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, eIDSR, eHMIS	80%	Quarterly

	Denominator: Total number of cases of diseases selected for case- based surveillance that occurred in the sub-county				
Analysis and Interpretation	Proportion of health facilities that have current trend analyzes **Numerator:** Number of health facilities that have current trend analysis for selected priority conditions **Denominator:** Total number of health facilities in the sub-county	Measures the practice and capacity of the health facility team to detect trends of suspected/ possible outbreaks	Supervisory report Health facility notice boards	80%	Quarterly
	Proportion of health facilities that have current lab analysis data for priority diseases (if applicable) Numerator: Number of health facilities that have lab data analysis for selected priority conditions. Denominator: Total number of health facilities in the sub-county	Evidence of routine laboratory data analysis and interpretation	Laboratory register	80%	Quarterly
Investigation and confirmation of suspected outbreaks	Proportion of suspected outbreaks of epidemic-prone diseases/ conditions notified to the sub-county within 24 hours of surpassing the epidemic threshold **Numerator:** Number of suspected outbreaks of epidemic- prone diseases/ conditions notified to the next level within 24 hours of surpassing the epidemic threshold **Denominator:** Number of suspected outbreaks of epidemic-prone diseases/ conditions in the sub-county	Measures use of data and thresholds for early detection of outbreaks and timely reporting to the next level	Log of suspected outbreaks and rumours. Sub-county analysis book orother routine analysis tool, HMIS tools	80%	Quarterly
	Proportion of reports of investigated outbreaks that include analyzed case-based data **Numerator**: Number of outbreak investigation reports that include case-based data **Denominator:** Total number of outbreak investigation reports conducted in the sub-county	Measures availability of additional variables for further analysis	Investigation reports, Case Investigation Forms Epidemic curve , Line lists or case-based reporting forms	80%	Quarterly
	Proportion of investigated outbreaks with laboratory results within 7 days **Numerator:** Number of investigated outbreaks with laboratory results within seven days **Denominator:** Total number of samples submitted for testing	Measures capacity of laboratory to confirm diagnosis and involvement of laboratory in surveillance activities	Log of suspected outbreaks and rumours Laboratory reports Outbreak investigation reports	80%	Quarterly

	Proportion of confirmed outbreaks with a nationally recommended public health emergency response **Numerator:** Number of confirmed outbreaks with a nationally recommended response **Denominator**: Number of confirmed outbreaks in the sub-county	Measures capacity of the sub-county to respond to outbreaks	Log of suspected outbreaks and alerts Outbreak investigation reports Supervisory reports	80%	Quarterly
	Proportion of samples from suspected outbreak timely transported within 24 hours **Numerator:** Number of suspected outbreaks of which samples were sent on time (within 24 hours) **Denominator:** Number samples collected from suspected outbreaks	Measure capacity to refer samples in a timely manner	Laboratory register	80%	Monthly
Prepare	Presence of a functional central unit for coordination of PHEMC (PH EOC) **Numerator:** N/A **Denominator:** N/A	Measure the Sub-county readiness	Minutes of reports, Annual work plans		Annually
	Proportion of health facilities with emergency preparedness and response (EPR) plans **Numerator:** Number of HF with EPR plans **Denominator:** Number of all HF	Measure preparedness of Health facility	Annual work plans		Annually
	Availability of a Sub-county Emergency Preparedness and Response Plan **Numerator:** N/A **Denominator:** N/A	Measure preparedness of Sub-county	Annual work plans		Annually
	Existence of funds for emergency response (Or budget line for emergency funds) **Numerator:** N/A **Denominator:** N/A	Measure preparedness of Health facility	Annual work plans		Annually

	Proportion of Health facility that experienced shortage of drugs and supplies for the most recent outbreak (define the time frame e.g.,	Measure preparedness of Health facility	H/F inventory		

	3, 6, 12 months) **Numerator:** Number of HF that experienced shortage **Denominator:** Total Number of all HF				
	Proportion of health facilities that have contingency Stocks for 3-6 months **Numerator:** Number of HF with contingency stocks **Denominator:** Total Number of all HF	Measure preparedness of a facility	H/F Inventory Observation		Quarterly
	Proportion of HF with availability of laboratory Diagnostic reagents **Numerator:** Number of HFs with available lab reagents **Denominator:** Total Number of Health Facilities	Measure the capacity of preparedness of a HFs	H/F Inventory Observation		Quarterly
	Proportion of Health facilities with available supplies for Specimen collection and transportation **Numerator:** Number of HFs with available specimen collection and transportation **Denominator:** Total Number of Health Facilities	Measure the capacity of preparedness of HFs	H/F Inventory Observation		
	Proportion of Labs with performance reports of routine quality assurance **Numerator:** Number of labs with performance of routine QA **Denominator:** Total Number of Labs	Measure the capacity of preparedness of HFs	Quality reports		Quarterly
Respond	Presence of a Functional Public Health Emergency Management Committee **Numerator:** N/A **Denominator:** N/A	Measure ability to respond at sub-county level	Minutes from Sub-county Health Office		Quarterly

	Proportion of HFs with functional Public Health Emergency Management Committee **Numerator:** Number of HFs with functional Committee **Denominator:** Total Number of all HF	Measure ability to respond at health facility level	Minutes from Health Facility records		Quarterly

	Availability of Public Health Emergency Rapid Response Team (PHERRT) **Numerator:** N/A **Denominator:** N/A	Measure ability to respond at health facility level	Minutes from Sub-countyHealth Office		Quarterly
	Case Fatality rate for each epidemic prone disease reported **Numerator:** Number of deaths from each of the epidemic prone diseases **Denominator:** Number of cases from the same epidemic prone diseases	Measures quality of case management	Routine reports and outbreak investigation		
	Attack rate for each outbreak of priority disease **Numerator:** Number of new cases of an epidemic prone disease that occurred during an outbreak **Denominator:** Number of populations at-risk during the outbreak	Helps to identify the population at-risk and efficacyof the intervention	Demographic data about the sub-county, Outbreaks investigation report withline lists or case-based forms	Depends on disease	
	Proportion of Outbreaks or any public health event responded to in the previous 12 months **Numerator**: Number of suspected outbreaks of epidemic prone diseases responded **Denominator:** Total number of suspected outbreaks of epidemic prone diseases/events	Measures early detection and timely reporting of outbreaks	Health facility log of suspected outbreaks and alerts	80%	
	Proportion of Hospitals with Infection Prevention and Control (IPC) requirements established including isolation ward/unit **Numerator:** Number of Hospitals that reported having established Infection Prevention and Control (IPC) requirements **Denominator:** Total number of Hospitals in the sub-county	Measures the practice and the Capacity of the hospitals to apply infection control requirements	Routine summary reports and supervisory reports Observation of IPC practices		Annually
Provide Feedback	Availability of feedback reports/letters/bulletin **Numerator:** N/A **Denominator:** N/A	Presence of a feedback mechanism	Observation		Quarterly

	Proportion of feedback bulletins/reports sent to the lower level **Numerator:** Number of reports/bulletins or any documentation actually sent to lower level and received **Denominator**: Total number of reports/bulletins or any form of feedback document expected to be sent to lower levels	Presence of a feedback mechanism	Observation		Quarterly

Annex 8C: Indicators for monitoring IDSR core functions at the county level

IDSR Core Function	Indicator	Purpose	Source of information for numerator and denominator	Target	When to be done
Identify	Proportions of sub-counties with IDSR guidelines to guideidentification of cases **Numerator:** Number of Sub-counties with Guidelines **Denominator:** Total number of all sub-counties within thecounty	Correctly identify and fill cases / events	Sub-county Inventory	100%	Quarterly
	Proportion of sub-counties reporting information using eIDSR/EBS **Numerator:** Number of sub-counties reporting informationusing event-based surveillance methods **Denominator:** Total number of all sub-counties within thecounty	Measure the ability of the system to capture unusual events	Routine summary reports and supervisory reports	80%	Quarterly
	Number of events recorded in the log book of rumour **Numerator:** N/A **Denominator:** N/A	Measure the ability of the county to capture unusual events from unofficial reports sources	County rumour logbook	N/A	Quarterly
	Proportion of sub-counties with routine surveillance datavalidation systems **Numerator:** Number of sub-counties having routine datavalidation system for surveillance data **Denominator:** Total number of all sub-counties within thecounty	Measures the routine validation of surveillance data	Sub-county and countyReports	100%	Monthly

Reporting	Proportion of weekly 033b surveillance reports submitted from the sub-county to the county **Numerator:** Number of sub-counties that submitted IDSRreports to the county **Denominator:** Total number of sub-counties that report tothe county level	Measures the practice of completeness of submitted surveillance data	Monitoring chart Routine summary reports	90%	Weekly
	Proportion of weekly 033b surveillance reports submitted from the sub-county to the county on time **Numerator:** Number of sub-counties that submitted IDSRreports on time to the county **Denominator:** Total number of sub-counties that report tothe county level	Measures the practice of timely submission of surveillance data	Monitoring chart Routine summary reports	90%	Weekly
	Proportion of diseases targeted for elimination, eradication and any diseases selected for case-based surveillance reported with case-based forms or line lists. **Numerator:** Number of diseases targeted for elimination, eradication, and any diseases selected for case- based surveillance reported with case-based forms or line list **Denominator:** Total number of diseases targeted for elimination, eradication and any other disease selected for case-based surveillance	Measures reporting of surveillance data with detailed information to use for further analysis	Routine summary reports and case-based or line listing reports	80%	quarterly
Analysis and Interpretation	Proportion of sub-counties in which a current line graph isavailable for selected priority diseases **Numerator:** Number of sub-counties with priority diseasesfor which a current line graph is available. **Denominator:** Total Number of sub-counties within thecounty	Measures the practice and capacity to analyze surveillance data	Supervisory reports sub-county analysis book	80%	Quarterly

	Proportion of sub-counties in which an updated spot map ofcases is available for selected priority diseases **Numerator:** Number of sub-counties with priority diseasesfor which an updated spot map is available. **Denominator:** Total Number of sub-counties within thecounty	Measures the practice and capacity to analyze surveillance data	Supervisory reports sub-county analysis book	80%	Quarterly
	Proportion of sub-counties that report laboratory data fordiseases under surveillance **Numerator:** Number of sub-county labs that submittedmonthly data to higher level **Denominator:** Total number of sub-county labs within thecounty	Measures if sub-counties are collecting and reporting labdata to higher level	Supervisory reports sub-county analysis book	80%	Quarterly
Investigation and confirmation of suspected Cases	Proportion of suspected outbreaks of epidemic prone diseases / conditions notified to the national level within 24 hours of surpassing the epidemic threshold **Numerator:** Number of suspected outbreaks of epidemic prone diseases / conditions notified to the national level within 24 hours of surpassing the epidemic threshold **Denominator:** Total number of suspected outbreaks of epidemic prone diseases / conditions within the county	Measures early detection and timely reporting of outbreaks	Log of suspected outbreaks and alert Routine summary reports	80%	Quarterly
	Proportion of reports of investigated outbreaks that includes analyzed case-based data **Numerator:** Number of outbreak investigation reports that include epi curve, mapping, personal tables and case-based forms or line lists **Denominator:** Total Number of outbreaks investigation reports within the county	Measures availability of additional variables for further analysis including possible risk factors involved	Investigation reports Routine summary reports	80%	Quarterly

	Proportion of investigated outbreaks with laboratory results **Numerator:** Number of investigated outbreaks with laboratory results	Measures capacity of the laboratory to confirm the diagnosis and involvement of laboratory in the surveillance activities	Outbreak investigation reports Laboratory reports	80%	Quarterly

	Denominator: Total number of investigated outbreaks within the county		Routine summary reports Log of outbreaks and rumours		
	Proportion of confirmed outbreaks with a nationally recommended public health response **Numerator:** Number of confirmed outbreaks with a nationally recommended public health response **Denominator:** Total Number of confirmed outbreaks within the county	Measures capacity of the county to respond to outbreaks	Log of suspected outbreaks and alerts Outbreak investigation reports Supervisory visit reports	80%	Quarterly
	Proportion of labs performing routine testing and reporting of Antimicrobial resistance **Numerator:** Number of labs reporting AMR results **Denominator:** Total Labs within the county	Measure capacity in readiness to respond to AMR outbreaks	Central Public Health Laboratories (CPHL) Lab register	80%	Quarterly
Prepare	Presence of a functional coordination of PHEMC (PHEOC) at county level **Numerator:** N/A **Denominator:** N/A	Measure the County readiness	Minutes of reports, Annual work plans		Annual
	Proportion of sub-counties with established functional sub-county Task Forces **Numerator:** Number of sub-counties with the functional sub-county Task Forces **Denominator:** Total number of sub-counties within the county	Measure the County readiness	Minutes of reports, Supervision reports	90%	Annual
	Proportion of sub-counties withemergency preparedness and response plans **Numerator:** Number of sub-counties with EPR plans	Measure preparedness of sub-counties	Minutes of reports, Supervision reports	90%	Annually

	Denominator: Total number of sub-counties within thecounty				
	Proportion of sub-counties with public health risk andresource mapping **Numerator:** Number of sub-counties that reported havingconducted public health risks and resources mapping **Denominator**: Total number of sub-counties within thecounty	Measure the practice and capacity of the sub-county toconduct mapping of available resources and risks	Risk assessment and mapping reports and Resource mapping reports	80%	Annually
	Proportion of sub-counties with funds for emergencypreparedness and response **Numerator:** Number of sub-counties with Budget lines foroutbreak preparedness **Denominator:** Number of sub-counties within the county	Measure preparedness of Sub-county	Annual Work plans, Meeting minutes, observations	80%	Annually
	Proportion of sub-counties that have contingency stocksincluding lab supplies for 3-6 months **Numerator**: Number of sub-counties with contingencystocks **Denominator:** Number of sub-counties within the county	Measure preparedness of sub-county	Sub-county/County Inventory Observation	80%	Quarterly
	Proportion of sub-counties labs with performance reports ofroutine quality assurance **Numerator:** Number of sub-county labs with performanceof routine QA **Denominator:** Number of sub-county labs within thecounty	Measure the capacity of preparedness	Quality assurance reports	80%	Quarterly
Respond	Proportion of sub-counties with functional Sub-county RapidResponse Teams (SCRRTs) **Numerator:** Number of sub-counties with functional DRRTs **Denominator:** Total number of sub-countieswithin the county	Measures ability of counties and sub-counties preparedness towards emergencies	Supervisory reports Minutes of meetings of DRRT	80%	Quarterly

	Attack rate for each outbreak of priority disease / conditions	Helps to identify the population at-risk and efficacy of the intervention	Demographic data about the sub-county, Outbreaks	Depends on disease	Quarterly

	Numerator: Number of new cases of an epidemic prone disease / condition that occurred during an outbreak **Denominator:** Number of populations at-risk during the outbreak		investigation report with line lists or case-based forms		
	Case Fatality rate for each epidemic prone disease / condition reported **Numerator:** Number of deaths from each of the epidemic prone diseases / conditions during an outbreak **Denominator:** Total Number of cases from the same epidemic prone disease during an outbreak	Measures quality of case management and response to outbreak	Routine reports and outbreak investigation	Depends on disease	Quarterly
	Proportion of Outbreaks or any public health events responded to within 24hours of detection **Numerator:** Number of suspected outbreaks of epidemic prone diseases responded to within 24hours of passing a response threshold **Denominator:** Total number of suspected outbreaks of epidemic prone diseases/events reported	Measures early detection and timely reporting of outbreaks	Health facility log of suspected outbreaks and alerts	80%	Annual
	Proportion of health facilities with Infection Prevention and Control (IPC) requirements **Numerator:** Number of health facilities that reported having established Infection Prevention and Control (IPC) requirements **Denominator:** Total number of health facilities within the county	Measures the practice and the Capacity of the hospital to apply infection control measures	Routine summary reports and supervisory n	80%	Annually
Provide Feedback	Proportion of sub-counties with epidemiological analyzespublished in bulletins / newsletters / manuscripts / briefs summaries **Numerator:** Number of sub-counties with analyzes published in bulletins / newsletters / manuscripts /briefs summaries	Presence of a feedback mechanism in the countyand sub-counties	Supervision reports, bulletins, newsletters, manuscripts, brief summaries	60%	Annual

	Denominator: Total number of sub-counties within thecounty				

Annex 8D: Indicators monitoring IDSR core functions at national level

Core Surveillance	Indicator	Purpose	Numerator	Denominator	Source of information	Target	When to be done
Identifying	Proportions of counties with IDSR guidelines to identify cases	Correctly identifying and filling cases/events	Number of counties with guidelines	Total number of all counties	County inventory	100%	Quarterly
	Proportion of counties reporting information using EBS	It measures the ability of the system to capture unusual events	Number of counties reporting information using event-based surveillance methods	Total number of all counties	Routine summary reports and supervisory reports	80%	Annually
	Number of events recorded in the log book of alerts	It measures the ability of national level to capture unusual events from unofficial reported sources	N/A	N/A	National logbook of alerts		
	Proportion of counties with routine data validation system	Measures routine validation of data	Number of counties having routine data validation system	Total number of all counties	National Reports		
Reporting	Proportion of health facilities submitting IDSR reports on time to the county	Measures practice of timely submission of surveillance data from health facilities to county	Number of health facilities submitting reports on time to the county	Number of counties	Summary reporting forms	80%	
	Proportion of monthly surveillance reports submitted from the sub-counties to the county on time in the last 3 months	Measures practice of timely submission of surveillance data	Number of provinces that submitted IDSR reports on time to the county	Total number of counties 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

Analysis and Interpretation	Proportion of counties in which a current line graph is available for selected priority diseases	Measures practice and capacity to analyze surveillance data	Number of priority diseases for which a current line graph is available in the counties.	Number of counties	Supervisory reports; county analysis book	80%	
	Proportion of regional/provincial laboratories reporting analyzed lab data to the national lab	Measures how well regional/provincial levels analyze county laboratory data	Number of provincial laboratories analyzing and reporting to NPHL monthly	Total number of provincial labs	National public health laboratory		
	Proportion of counties that report laboratory data for diseases under surveillance	Measures if counties are collecting and reporting lab data to higher level	Number of county labs that submitted monthly data to higher level	Total number of county labs	National log book of records received		
Investigation and confirmation of suspected outbreaks	Proportion of suspected outbreaks of epidemic-prone diseases 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%	

Annex 8E: Monitoring Chart for performance of IDSR indicators at health facility level

Instructions:

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

Each month, summarize and compile the health facility's summary data for priority diseases. Report the summary data to the sub-county level on time. Record on this chart the indicator results. Share this chart with the sub-county supervisor during his or her visitto the health facility, or bring it to the scheduled sub-county health team (DHT) meetings.

Indicator	Ja	Fe	Ma	Ap	Ma	Ju	Ju	Au	Se	Oc	No	De
Availability of SCD and HMIS												
Existence of a mechanism to capture unusual or public health events from non-												
Proportion of complete surveillance reports												
Proportion of complete surveillance reports												
Proportion of cases of diseases /conditions selected for case-based surveillance, which were												

Proportion of priority diseases / conditions for which a current												
Proportion of priority diseases / conditions for												
Availability of an all Hazards Emergency												
Availability of supplies for specimen collection and transportation												
Availability of contingency stocks of emergency												
Proportion of suspected outbreaks of epidemic prone diseases /												
Proportion of samples from suspected outbreak												
Availability of a functional task force for outbreak preparedness												
Availability of an isolation facility												

Case Fatality rate for each epidemic prone												
Attack rate for each epidemic-prone disease /												
Availability of community												
Proportion of feedback bulletins / reports received												
Reply YES or NO to the following checklist items												
Were the weekly surveillance												
Were the weekly surveillance												
Are the trend graphs up-to-												
If YES, have you observed any changes in the trends?												
If YES, has the threshold been												
If YES, have you taken action to alert the sub-county?												

Annex 8F: Monitoring chart for performance of IDSR indicators at sub-county, county level

Sub-county: _____ ***County:*** _____ ***Year:*** _____

Indicator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Proportions of Health facilities with SCDs												
Proportion of sub-countiesreporting informationusing eIDSR / EBS												
Proportion of health facilities within thesub-county with standardized HMIS registers and forms												
Number of events recorded in the sub-county log book for rumours												
Proportion of health facilities submitting IDSR reports to the sub-county												
Proportion of health facilities submitting IDSR reports on time to the sub-county												

Proportion of cases of diseases / conditions targeted for elimination, eradication and anydiseases selected forcase-based surveillance reported with case-based forms												

Proportion of hospitals submitting IDSR reports on time												
Proportion of private health facilities submitting IDSR reports on time												
Proportion of priority diseases / conditions for which a current line graph is available												
Proportion of health facilities that have current trend analysis												
Proportion of health facilities that have current lab analysis data for priority diseases analyzed												
Proportion of suspected outbreaks of epidemic-prone diseases/ conditions notified to the county/provincial levelwithin 24 hours orcrossing the epidemic threshold												
Proportion of reports of investigated outbreaks that include analyzed case-based data												

Proportion of investigated outbreaks with laboratory results												
Proportion of confirmed outbreaks with a nationally recommended public health response												
Proportion of samples from suspected outbreaks transported the laboratory within 24hrs for investigation												
Presence of a functional county unit for coordination of PHEMC (County PHEOC)												
Proportion of health facilities with emergency preparedness and response plans												
Availability of a Sub-county Emergency Preparedness and Response Plan												
Proportion of Health facilities with a functional outbreak task force												

Availability of Public Health Emergency Rapid Response												
Case Fatality rate for each epidemic prone disease reported												
Attack rate for each outbreak of priority												
Proportion of outbreaks or any public health event responded to in the previous 12 months												
Proportion of hospitals with isolation facilities												
Availability of feedback reports/letters/bulletin												
Proportion of feedback bulletins/reports sent to the lower level												

Annex 8G: Sample form for recording timeliness and completeness of weekly/monthly reporting from the health facility to the sub-county

Country_____Sub-county _____

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												

Legend

T = arrived on time

L = arrived late

W=report not received

*The timeliness and completeness are expressed as percentages (%). When the surveillance system is good, the rates for timelinessand completeness should approach 100%. This table allows for monitoring the progress of these two indicators in the sub-county so that action can be taken to improve timeliness for each health facility in the sub-county.

Annex 8H: 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	1. How often do you collect information from the community about reports of suspected cases or deaths due to a priority disease or condition?		
Register cases	1. Are diagnoses of cases of priority diseases / conditions recorded in the	Yes [ ] No[ ]	
Report	1. Do health worker use a standard case definition to report the suspected cases and outbreaks? 2. Do you record information about immediately notifiable diseases / conditions on a case form or line list?	Yes [ ] No [ ] Yes [ ] No [ ]	
Analyze and Interpret	1. Do you plot the numbers of cases and deaths for each priority disease / condition on a graph? (Ask to see the health facility's analysis book. Look to see if the trend lines are up-to date.) 2. Do you plot the distribution of cases on a map?	Yes [ ] No [ ] Yes [ ] No [ ]	
Investigate and Confirm Reported Cases and Outbreaks	1. If an epidemic-prone disease / condition was suspected, was it reported immediately to the sub-county office? 2. For the cases of priority diseases / conditions needing laboratory tests seen since the last supervisory visit, how many had laboratory results? 3. Are appropriate supplies available or set aside for collecting of laboratory specimens during an urgent situation? (show me the supply)	Yes [ ] No [ ] Number of results obtained: Number of expected cases seen: Yes No	

ACTIVI TY	SUPERVISORY QUESTION	ANSWER	COMMENT (What Caused Problem)
Respond	1. Are appropriate supplies available for responding to a confirmed case or outbreak *(for example, immunization supplies and vaccine, ORS, antibiotics, and so on*)? 2. Please show me the supplies for carrying out a recommended response. 3. Who is the outbreak coordinator for this facility? 4. How often do you provide information and training in outbreak response to the staff of this facility?	Yes [ ] No [ ] Supplies seen Yes [ ] No [ ] Name: Designation : Training is done :	
Provide Feedback	1. How often do you report information to the community? 2. Do you receive the latest bulletin from the *(Central, subnational*) level?	Report it Yes [ ] No [ ]	
Evaluate and Improve the System	1. Were the last 3 routine weekly reports sent to the sub-county office? 2. Were the last 3 routine monthly reports sent on time?	Yes [ ]No [ ] Yes [ ] No [ ]	
Epidemic Preparedness	1. What precautions do health worker (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: Indicators for monitoring the performance of IDSR at National level

1. Proportion of health facilities submitting weekly (or monthly) surveillance reports in timeto the "sub-county".
2. Proportion of sub-counties submitting weekly (or monthly) surveillance reports in time to thenext 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 sub-county using case-based or line- listing forms.
4. Proportion of suspected outbreaks of epidemic-prone diseases notified to the next higherlevel within 48 hours of surpassing the epidemic threshold.
5. Proportion of health facilities in which a current trend analysis (line graph or histogram) orspot map is available for selected priority diseases.
6. Proportion of sub-counties that produce a regular weekly (or monthly) IDSR bulletin.
7. Proportion of reports of investigated outbreaks and other public health emergencies thatinclude analyzed case-based data.
8. Proportion of investigated outbreaks or events with laboratory results within seven days.
9. Proportion of confirmed outbreaks or other public health emergencies with a nationallyrecommended public health response within 48 hours.
10. Case fatality rate for each epidemic-prone disease reported.
11. Incidence of priority diseases, events and conditions.
12. Mortality from priority diseases, events and conditions.
13. Number of epidemics detected at the national level that were missed by the "sub-county"level during the last year.
14. Proportion of sub-counties that report laboratory data for diseases under surveillance.
15. Proportion of sub-county laboratories that received at least one supervisory visit that includedwritten feedback from the provincial or national level during the last year.

16. Proportion of sub-counties reporting monthly analyzed laboratory data to the nationalreference laboratory.

Annex 8J: Indicators for monitoring performance of core functions of Integrated Disease Surveillance and Response

1. Proportion of health facilities submitting weekly (or monthly) surveillance reports on time to the county.
2. Proportion of county's 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 county 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 counties 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 analyzed 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 county level during the last year.
13. Proportion of selected laboratories that are reporting monthly laboratory data for priority diseases under surveillance.
14. Proportion of county laboratories that received at least one supervisory visit that included written feedback from the provincial or national level during the last year.

What constitutes Response standards within 24 to 48 hours:

a) Conduct initial rapid assessment/situation 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 multisectoral emergency coordination meeting
f) Develop an initial response strategy, objectives and action plan
g) Issue initial internal situation report (sitrep)

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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES FOR KENYA

THIRD EDITION



Section 9: Electronic integrated Diseases Surveillance and Response (eIDSR)

May 2022

9.0 ELECTRONIC INTEGRATED DISEASE SURVEILLANCE AND RESPONSE (eIDSR)

9.1 Introduction

Electronic IDSR (eIDSR) is the application of electronic tools to principles of IDSR to facilitate prevention, prediction, detection, reporting and response. It is based on:

a) standardized interoperable and interconnected information systems administered within the national context; and

b) rapid collection, analysis, reporting and use of disease/events data in real-time for appropriate public health action.

Using paper-based tools for implementation of IDSR has been an instrumental strategy for strengthening public health surveillance in the African Region since IDSR was adopted in 1998. 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 and analytical innovations have emerged as an approach which can be used to facilitate rapid transmission of public health surveillance information, thus aiding timely detection of and response to outbreaks and other public health events. 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 accelerating achievement of the IHR (2005) core capacities.

Rationale of eIDSR

Limitations of the current approaches to IDSR data collection and transmission are attributed to the fact that many countries still use manual procedures and paper-based methods to collect and transmit data. Submitting and transmitting data on time is a challenge, as health workers have to travel long distances on difficult terrains to submit their files. This leads to delays in getting information on time for action, especially in the event of a suspected outbreak.

The eIDSR system aims to facilitate the work of every staff member in a health system, by improving disease surveillance using electronic tools, and hence strengthening surveillance and response capacities, while, in the long-term reducing morbidity and mortality due to epidemic-prone diseases as well as other public health events.

eIDSR is thus likely to improve the following:

(a) Timeliness and completeness of reporting

(b) Early detection, investigation, and response to outbreak or public health events

(c) Data quality and accuracy as the manual data entry that is prone to errors

(d) Systematic information sharing across levels and sectors

(e) Combining data streams

(f) Data use, analysis, analytics

Recently, there have been various supporting initiatives and resolutions, regionally and globally, which have recognized the potential of digital technologies to advance the Sustainable Development Goals (SDGs), and particularly to support health systems in all countries in health promotion and disease prevention. The eIDSR is, hence, developed to reflect the following recently adopted overarching frameworks:

a) Integrated Disease Surveillance and Response ((AFR/RC/48.8) (b) IHR (2005) (WHA58.3)
b) Regional Strategy for Health Security and emergencies strategy (AFRO/RC66/6)
c) eHealth resolution and decision (WHA58.28)
d) Digital health (WHA71.7)
e) Global Health Security Agenda

The MoH through DDSR in collaboration with the Division of Informatics has in the recent past invested significantly in the development of digital solutions to enhance diseases surveillance and reporting. Some of the solutions developed include indicator-based disease surveillance instances in KHIS (weekly reporting module, COVID -19 tracker and Case-based reporting).

mDharura is an electronic platform that supports Event Based Surveillance in the country.

Emergency Alert and Reporting System (EARS) is an electronic platform for the Public Health Emergency Operation Center.

A disease surveillance website is also available at DDSR.

9.2 Disease Surveillance applications in DHIS2

Kenya adopted the use of DHIS2 software as a national data management system in 2011. In the year 2016 weekly epidemic monitoring for the 23 weekly reporting was integrated in the DHIS2.

The Sub-county Health Information System Software (DHIS) is a free and open-source database and application for collecting, processing, and analyzing health information, and whose development and implementation was started in 1998 by the Health Information System Programme (HISP) based in South Africa.

The overall objective of DHIS2 implementation is to be able to generate, analyze and disseminate health information to facilitate effective policy formulation, management, planning, budgeting, implementation, monitoring and evaluation of health services and program interventions in the health sector. DHIS2 is able to support collection and analysis of routine health services data, as well as non-routine data such as population estimates, facility workload and survey data. Currently this data is collected by means of a paper-based system of registers, tally sheets, and monthly data collation forms at each health facility. The collated weekly/monthly data is either entered directly into the web-based DHIS2 or sent to the sub county level where is entered on to the web-based DHIS2 software, then analyzed in the system. The system has inbuilt tools for the weekly reportable priority diseases and conditions and also has capability for the generating summaries for the monthly reportable priority diseases and conditions.

The web-based DHIS2 is intended to capture health facility service delivery data that includes priority diseases and allow analysis at that level, promoting data use at all levels for decision making. DHIS2 is configured to allow the generation of disease surveillance reports, which can be either standard or customized on weekly and monthly bases depending on surveillance requirements. The system has inbuilt analytics that include data quality module and provides dashboards for data visualization, monitoring and evaluation of health surveillance indicators. Data

quality is addressed through mechanisms incorporated into the data collection process and functions within the DHIS software.

Pre requisites for DHIS2 user

Browser:

The DHIS 2 is web-based application and is available in an Internet browser when you have Internet connectivity at **https://hiskenya**. The system is compatible with the following browsers

Google Chrome

Mozilla 8

Internet Explorer 9 and above

Login:

KHIS has controlled login that provides access to more privileged system functionalities. Information access level and manipulation privileges once logged in will be determined by the user rights ascribed to the user. This is designed in compliance to data security, integrity and confidentiality requirements desirable for data governance and protection**.**

The username and passwords assigned by the system administrator (National MOH Informatics division.

Usernames

No set parameters

May be assigned to or created by users

Usually easy to remember

Passwords

Usually have set parameters or characteristics

May be assigned to or created by users

Should be changed periodically



Figure 40: *KHIS Login Page*

Data security

The weekly epidemic monitoring tool (MoH 505) is the main data collection tool at the facility that is submitted to the sub county Disease Surveillance officer for consequent entry into KHIS. If the facility has user rights the report is entered at facility. All facilities are expected to have submitted their preceding weeks report by Monday of every week while he Sub-county report is expected to have submitted aggregated reports by Wednesday of every week. This data is analyzed and used to generate weekly epidemiological reports and a bulletin at National level. This will enable follow up on trends of occurrence of diseases and conditions of priority diseases in the country. KHIS supports protection of surveillance data against deliberate or accidental access of unauthorized persons at all levels.

Privacy

The MoH is in cognizant of the requirement for individuals to have the right to control what information is collected about them, how it is used, who has used it, who maintains it, and what purpose it is used for.

Confidentiality

KHIS is built in a way that ensures the information stored is protected against unintended or unauthorized access.

Dashboards

This is graphical summary of disease trends, reporting rates and timeliness of reporting can be viewed. Pie charts, maps, bar graphs and line graphs are used to depict the data that can also be filtered by epidemiological week, sub county, County or disease. KHIS system is simple, scalable, user friendly and capable of capturing both community and health facility level data, hence able channel surveillance information for decision making by availability of predefined dashboards for data visualization

Data Flow Chart

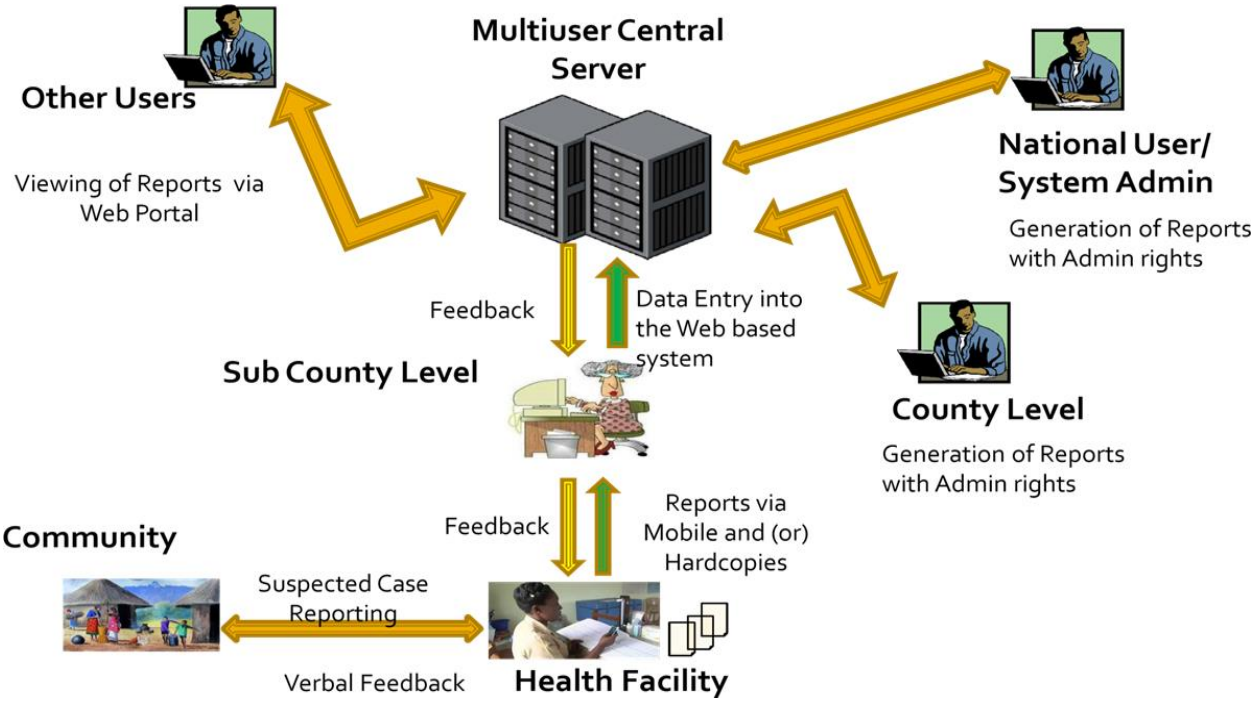


***Figure 41**: Data Flow Chart*

The Kenya Weekly Epidemiological bulletin

The weekly epidemiological bulletin is a weekly product of the from surveillance data generated in KHIS and their data sources. The weekly epidemiological bulletin is a critical report for surveillance in the country. It serves in the provision of a snap shot of surveillance progress and feedback to all levels.

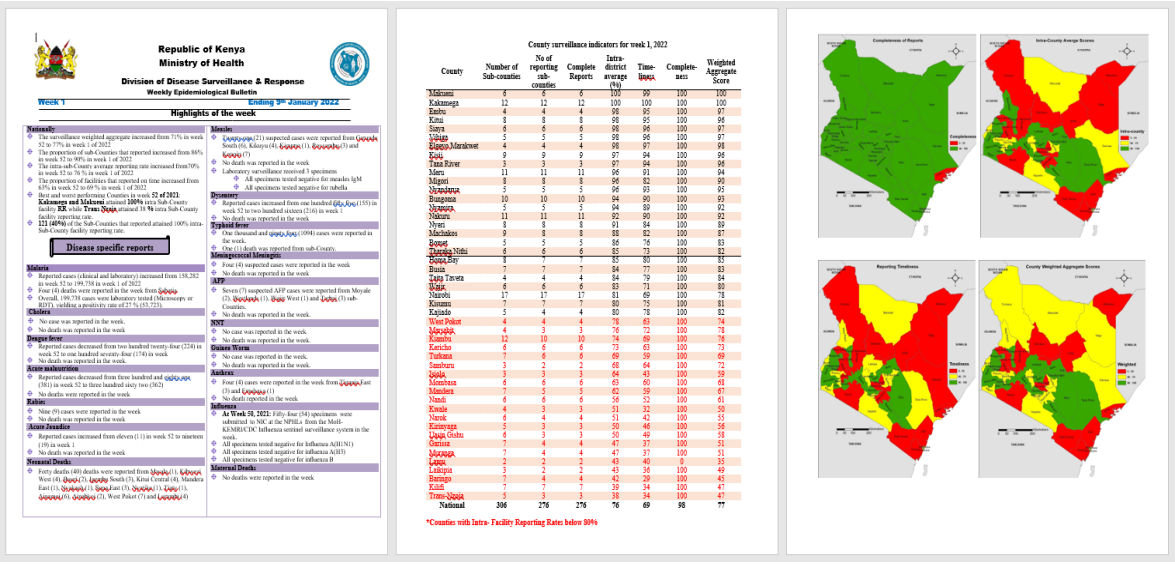


***Figure 42:** The Kenya Weekly Epidemiological bulletin*

COVID-19 Dashboards

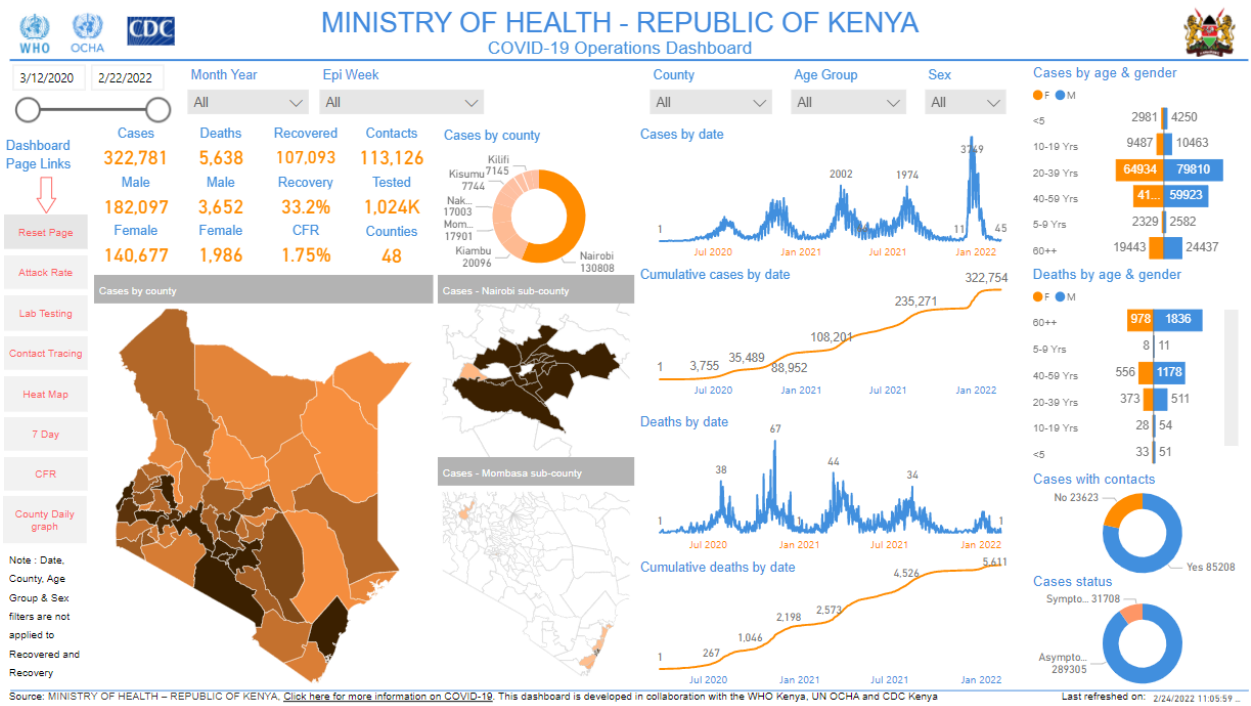
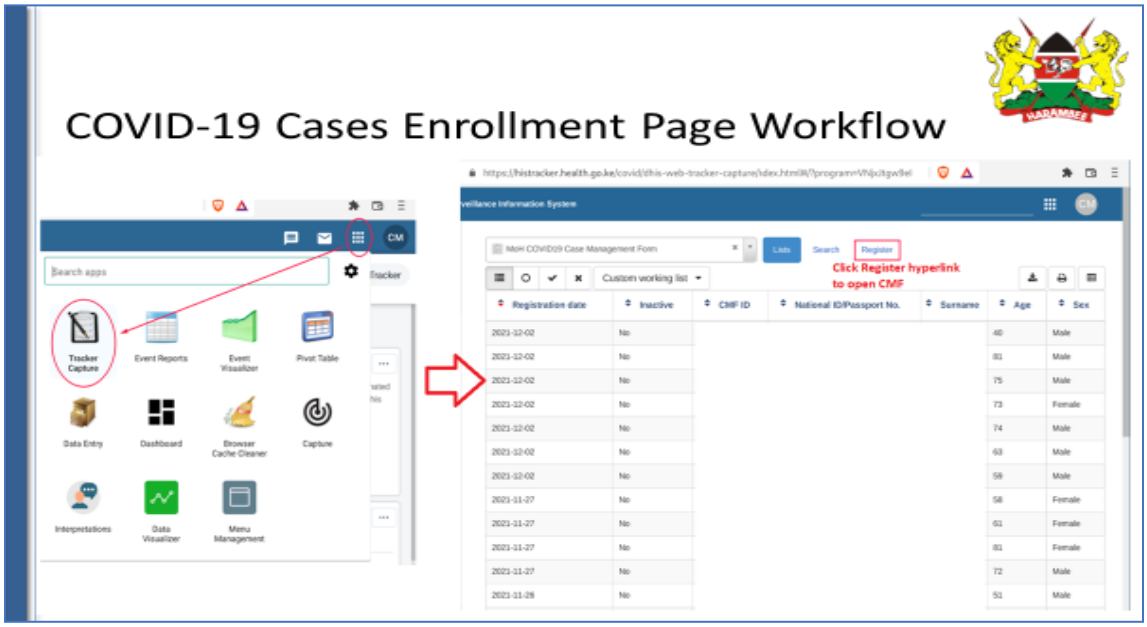


Figure 43: *COVID-19 Dashboard*

KHIS Tracker Data Capture for COVID-19 case enrolment, management and reporting



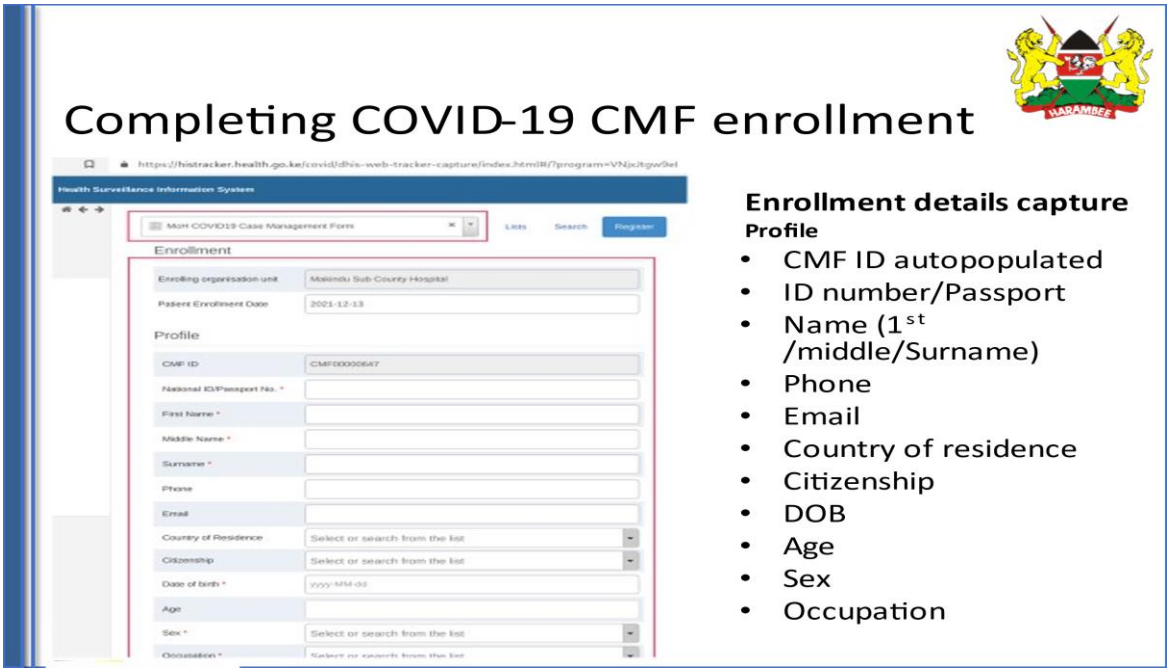


Figure 44: *KHIS Tracker Data Capture for COVID-19 case enrolment, management and reporting*

9.3 M-Dharura Event Based Surveillance reporting system

m-Dharura is a reporting system that supports event-based surveillance. m-Dharura is designed to be simple for all users in the system. Mdharura supports EBS surveillance at both community and facility levels. Predefined alerts are raised and reported through a mobile based reporting system

Service Description

1. SMS support

a) Allows users to report signals detected using SMS by sending signal code (e.g., 1, 2… for CEBS) to a short code (40327).
b) Sends reminders on SMS to users about signals reported and various forms to be filled.

2. Android app

a) Allows users at different levels (national, county, sub-county, community unit etc.,) to manage themselves hence decentralizing user management
b) from the national level.
c) Allows users to report EBS signals detected.
d) Allows users to fill and submit different forms required in EBS.
e) Provides support for both online (using the internet) and offline (using SMS) submission of forms.
f) Provides in-app simplified dashboards for users at different levels.

3. Analytics platform

a) Provides a web interface for analysing EBS data.
The analytics platform allows different users to see trends at different levels at a glance.
b) Displays different indicators generated from EBS data.
c) Provides downloadable dashboards and data to allow users to analyze data independently.

4. **API support**

a) Provides support to integrate into other national surveillance and health

information systems (e.g., DHIS2).

Access, Authentication and Authorisation

1. Access

Access is through mobile applications available in Android Google Play Store and IOS Apple App Store, and web application.

2. Authentication

Once a user downloads the application, they will be required to enter their phone number to login into the app

an SMS code will be sent to their phone number with a one-time password. They will be required to enter this in a provided screen for them to be allowed to log in.

3. Authorisation

a. The system is limited to specific users.
b. Access is granted by supervisors at different levels. These levels include:

i. National

ii. County

iii. Sub-county

iv. Community unit

v. Health facility

vi. Veterinary facility

vii. School

c. Access can be revoked by supervisors at the different levels upon abuse.

9.4 Emergency Alert and Reporting System (EARS)

Emergency Alert and Reporting System (EARS) is a system initially developed for the Emergency Operation Center of the Kenya Ministry of Health, Department of Disease Surveillance and Response Unit. The system aggregates the data collected both for immediate reportable diseases and public health events from DHIS2 and provide a channel that alerts the EOC for response. The system also allow input of other disease and public health events from any other relevant data source, including the daily EOC call registers, live news channels, newspapers, the internet and social media.The EOC National level started using this system in May 2017 and one of its success stories is the certification by WHO where Kenya was certified to be Guinea free country.

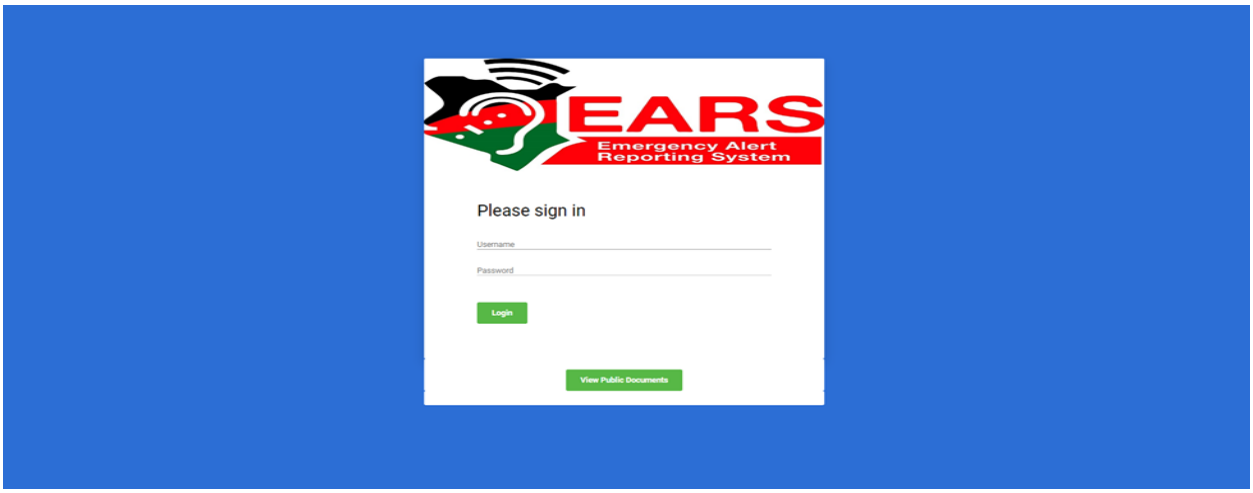


Figure 45: *EARS login page*

Ears System Access Levels

Level 1: National Level

At the national level, users will access data from every county. This will enable the users at this level to monitor and help coordination with the counties.

Level 2: County Level

At the county level, users will be able to access data that belongs to their specific county and sub county.

Level 3: Sub-county Level

At the sub county level, users will be able to view data for the whole county to enable them monitor what happens in neighboring sub counties

EARS Modules

Dashboard module

Dashboard to display system KPI's, with numbers of events in different modules

Data capture modules

Module to capture data into the system from different sources, i.e. from county EOC hotline, newspapers, internet and social media

Reports module

Report module to display reports based on data captured. These are customizable reports and raw data reports for extraction.

Mapping and GIS module

Heat maps of diseases within the county, health facility and lab reference locations within the county

Jitenge Module

Module for COVID-19 management (Truck drivers, air travelers, HBC and facility based quarantine)

Human resource module

Module to manage EOC staff, allocation of tasks and managing county resources I.e. vehicles for emergency response etc.

Contacts module

A module for emergency contacts. The module includes a database collection of all the emergency contacts within the county.

Document repository module

A repository for saving all relevant documents at a central place for sharing within the county staff e.g., minutes of meeting etc.

Jitenge

Jitenge System is an integrated platform that allows the capturing of progress data for COVID-19 exposed individuals in quarantine or isloation. As per the guidelines, the system will either monitor an individual for the 14 days of home isolation and care, 7 days post facility quarantine and isolation, or the number of days a truck driver is within the country's borders. Jitenge is available as an Android Mobile Application (Jitenge MOH Kenya), USSD Session (*299#), and a dynamic dashboard system.

Modules in Jitenge

Home Based Care & Isolation Module – initiated by the health care worker as per the MOH guidelines

Truck Drivers' Module – initiated by the point of entry officials or driver can self-register before entry

Designated Quarantine & Isolation Facility Module – initiated by the health care worker as per the MOH guidelines

Airline Module – Initiated by travelers entering Kenya as per the guidelines of the travelers surveillance form by MOH

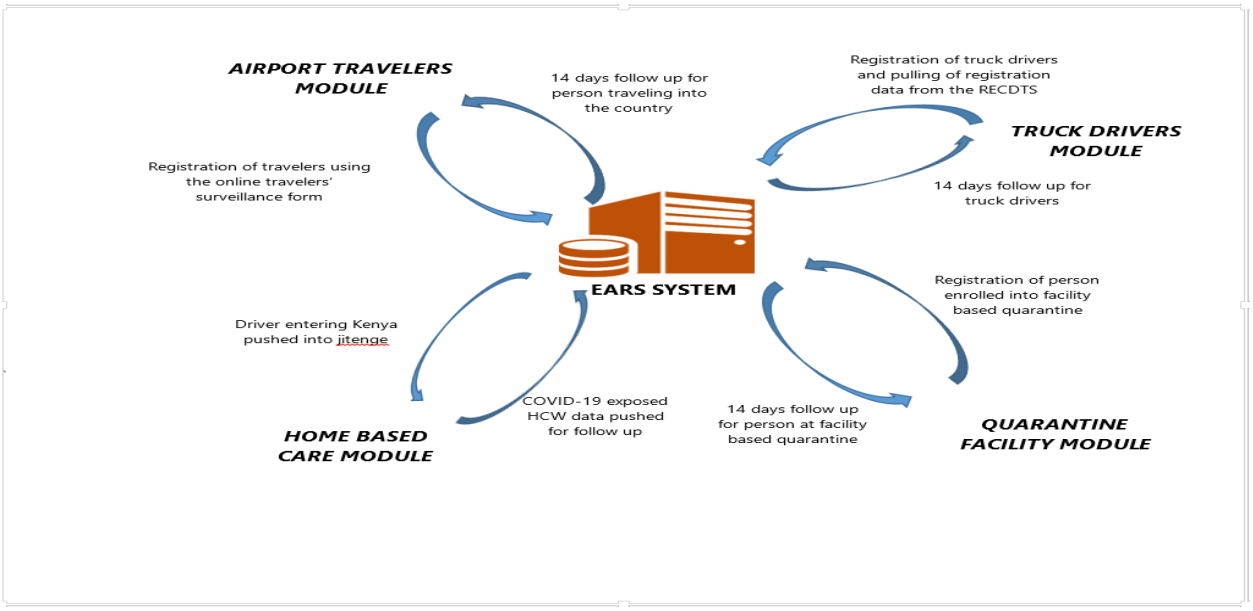


Figure 46: *EARS system Modules*

Jitenge Value Preposition

Contacts' daily reporting reminders

Ease of follow-up by Health Care Workers

Flagging of cases with alarming symptoms e.g. high temperature and any "Yes" response

Geo-location upon consent for clients

9.5 Benefits of eSurveillance

The eIDSR provides real-time information for immediate action. Potential benefits of eIDSR include:

(i)Early alert and detection

With eIDSR, the speed of outbreak detection can be improved, as information may be more rapidly captured, and in some cases, the time and place of an outbreak can be predicted with varying degrees of accuracy, thus enabling opportunities for prevention and control.

(ii)Timely reporting

eIDSR tools allow rapid and timely transmission of data from lower primary reporting units to subsequent higher levels to enable appropriate public health action. With availability of internet, data can be submitted in real time.

(iii)Standardization of data

Standardization of tools in the eIDSR system enables data collection to be more consistent and complete for ease of data exchange and comparison across health facilities.

(iv)Better data transmission and management including storage

A major challenge of paper-based data is a need to compile reports from various sources and provide reports to higher level offices at regular intervals and to different administrative levels. Moreover, data storage and transport can be difficult, and there is a risk of data damage and loss.

With eIDSR there is faster data transmission, and moreover, data are also organized into a format that is more accessible for use and interpretation.

Interoperability and sharing of data

eIDSR provides an opportunity for 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 e.g., the family planning logistic management report that the health facility provides is used to compute additional supplies.

Automated transmission, analyze s and improved quality data

Paper-based reporting 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 health staff.

Ultimate contribution towards good response, better monitoring and evaluation

eIDSR provides a platform for data storage and automatic analysis across health facilities for better monitoring and evaluation of various public health interventions.

Cost reduction

eIDSR makes for early detection of disease outbreaks, which in effect, can contribute to overall reduction of high costs associated with management of these outbreaks.

Data security and user-agreement policies

There should be clear guidelines on how to access data.

There should be scheduled data backups (local and remote).

Physical data storage devices should be secure and locked.

IT System Maintenance

Software upgrades, hardware upkeep or replacement and server maintenance should be considered, if system is in-house.

Sustainability

In order to ensure sustained support of the eIDSR program, a sustained financial base will need to be established to account for routine and one-time costs such as hardware system maintenance, training of personnel, connectivity costs and end- user materials, such as those for information, education and communication (IEC).

There should be local capacity to maintain 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 and computers, and associated operational costs.

Resources for continued capacity building, training, re-training, etc. should be established. eIDSR should be anchored within national eHealth policy and strategy.

Note: There should be, right from the beginning, stakeholder (including private companies and telecom companies) involvement in the design and implementation stage.

There should be advocacy for domestic financial resource allocation as well as innovative financial solutions, including leveraging resources from the private sector, such as telecom providers.

Interoperability

Ideally, data may be shared across systems (including with the surveillance system), from the animal and other relevant sectors.

9.6 Using eIDSR in Core surveillance functions

There are many components that will ensure successful implementation of eIDSR in the public health sector. These components include understanding the scope and operational environment, using the right tools, and building capabilities within the local context. The One Health approach provides an opportunity for creating interoperable, interconnected electronic reporting systems between human and animal surveillance systems.

The use of e-tools for conduct of Data Quality Assessment/Assurance (DQA) is also part of a monitoring and evaluation strategy of IDSR functions, which may be used for continuing improvement of data quality. Such tools can identify errors, inconsistencies and other data anomalies which can affect reliable, accurate, precise and complete data.

e-Surveillance platform is expected to facilitate;

- real-time reporting (indicator and event-based surveillance);
- alert notification (community and health facility reporting case-based reporting;
- routine reporting (weekly aggregates) and routine monthly reporting outbreak/emergency management;

- contact tracing, real-time outbreak line-listing event management (hazard description, characterization, risk assessment and outcomes);
- information products i.e., situation reports (Sitreps), epidemiological bulletin etc. refer to **Section 8;**
- monitoring and Evaluation and Data Quality Assessment (DQA); refer to **Section 8.**

9.7 Role and responsibilities at different levels in the context of real time reporting and outbreak/emergency management

The following are some roles and responsibilities with regard to eIDSR at various levels.

***Table 22**: Roles of stakeholders in eIDSR implementation at different levels*

Level	**Roles in eIDSR implementation**
Community	Contribute information on events e.g., through toll-free helplines
Health facility	Depending on the esurveillance 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
Sub-county	Provide Sub-County staff access to the electronic surveillance platforms Verify and approve onward transmission of reported events from lower health facilities Issue alerts to other facilities and leaders regarding events within the sub county Provide feedback to the reporting health facility regarding the event Update the health facilities and leaders regarding progress in the response Training, mentorship and supervision of health staff Mobilization of resources to support effective implementation of eIDSR Ensure availability of electronic surveillance compatible ICT equipment
County	Training and supervision Collaborate with National level for guidelines and TA to develop and update electronic tools Issue alerts to sub counties Provide feedback to the reporting sub-county regarding the event Monitor implementation of actions/recommendations from the national level

National	Maintaining the surveillance server Development and dissemination of guidelines Developing and updating electronic tools Managing the *e*surveillance system, including troubleshooting Maintaining system administration (registration of health staff using server) Training and supervision Routine routing of messages, analysis and provision of feedback to all stakeholders (national program, partners, sub-counties as well as health facilities, and notifiers) Issue alerts to sub-counties, region and other relevant stakeholders Coordination of partners and stakeholders in the implementation of esurveillance Ensuring linkage with other platforms, to facilitate interoperability and avoid duplication Monitoring alerts Advocacy to policy makers and mobilizing resources to sustain the system

9.8 Supervision, Monitoring and Evaluation

E Surveillance 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 such as:

- acceptability or willingness to participate. i.e., number of people who are accessing and using the system correctly;
- accessibility – Is the system accessible from the place where the reporting site is situated? In some areas, where mobile telephone is used for eSurveillance, accessibility is an important aspect, and this can hamper prompt reporting of diseases;
- data quality and completeness – Check for any data errors;
- timeliness of data submission;
- system flexibility,
- portability
- stability; and
- cost.

To improve data use at the service level, users should be encouraged to use the system with regular feedback of information to lower levels; information flow should not be one-way.

Other system performance indicators include core surveillance indicators for monitoring IDSR (**refer to section 8).** The IDSR support supervision checklist should be used during supervisory visits, while considering integrated

needs from other teams, in terms of joint supervision. The supportive supervision checklist has to be updated to incorporate eSurveillance, and uploaded as part of the eSurveillance platform. Overall evaluation of the eSurveillance 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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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES FOR KENYA

THIRD EDITION



SECTION 10: TAILORING INTEGRATED DISEASE SURVEILLANCE AND RESPONSE (IDSR) TO EMERGENCY OR FRAGILE HEALTH SYSTEM CONTEXTS

May 2022

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10.0 Introduction

Humanitarian emergencies have major implications for the populations where they occur and for their health services surveillance systems (WHO, 2012). Emergencies typically result in population displacement to congested settings where access to basic needs like water, food, shelter and other social services are constrained. These conditions increase the risk of death from common epidemic and endemic diseases.

Consequently, effective public health surveillance and outbreak response is a priority during public health emergencies in affected populations. Due to the disruption of health and other social services during the emergencies, the routine IDSR system must be enhanced to meet the public health surveillance and outbreak response needs in humanitarian contexts. In these settings, IDSR should be tailored to the prevailing context to meet the additional emergency needs.

Similarly, an Enhanced IDSR system should be established in such settings to address the humanitarian emergency. It should be based on the IDSR strategy, structures, tools, guidelines and resources, but should ensure the flexibility required in addressing the surveillance and response needs of affected populations in emergency situations. This should be done within the existing national IDSR system.

This section introduces key principles of implementing IDSR in complex humanitarian emergencies. This involves enhancing IDSR core functions to ensure early detection, assessment and response to acute public health events. For a more detailed description, please 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).

Acute and protracted crises have major immediate and long-term effects on population health and health systems. Conflicts and disasters create disruptions in the overall functionality of the health system. In such situations, the routine IDSR system may be underperforming or may be disrupted. The IDSR must therefore be tailored to adequately meet the surveillance information needs of a humanitarian emergency. Examples of such humanitarian emergencies include: armed conflict, famine, natural disasters and other major emergencies.

10.1 Key definitions in Emergency contexts

10.1.1 Disaster

A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources (International Strategy for Disaster Reduction [ISDR], 2009). A disaster is also defined as a situation or event which overwhelms local capacity, necessitating additional national or international assistance (Center for Research on Environmental Decisions [CRED, Relief Web, 2008).

10.1.2 Humanitarian Emergency

A situation where the basic human needs of a population are threatened and therefore requires extraordinary measures and urgent action (Relief Web, 2008).

10.1.3 Complex Emergency

A humanitarian crisis in a country, region or society where there is total or considerable breakdown of authority resulting from internal or external conflict and which requires an international response that goes beyond the mandate or capacity of any single and/or ongoing UN country program (ReliefWeb, 2008).

10.2 Early Warning and Response

Early warning is an organized mechanism to detect, as early as possible, any abnormal occurrence or any divergence from the usual or normally observed frequency of diseases, conditions and events. It relies on a network of people from functional static or mobile health facilities/clinics whose responsibility it is to collect, investigate, report, analyze and disseminate information from the field to the central level for appropriate action.

10.2.1 Rationale

The enhanced surveillance needs during humanitarian emergencies demand that surveillance systems are in place for systematic collection, collation, analysis, and interpretation of data, and for dissemination of information to facilitate public health response to prevent excess morbidity, mortality and disability (WHO, 2009). Consequently, during the acute phase of a humanitarian emergency, IDSR should be modified as soon as possible to focus on priority health problems during the emergency phase. The tailored IDSR should focus on diseases, conditions or events for a given emergency context and should be flexible enough to respond to other emerging public health priorities (WHO, 2009).

During emergencies, populations are more vulnerable to morbidity, mortality and disability resulting from endemic and epidemic-prone diseases. Thus, IDSR should be enhanced within 3–10 days of grading the public health emergency to facilitate rapid detection and response to disease outbreaks and public health events (WHO, 2009). Ultimately, this will contribute to the overall goal of reducing avoidable morbidity, mortality, and disability during humanitarian crises (WHO, 2009b)

10.2.2 Objectives of Orienting 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 sensitivity of detection, quality of risk assessment, and timeliness and effectiveness of the response to acute public health risks in order to minimize the negative health consequences to the affected population.

Specific objectives are to:

(a) Detect sudden public health events and health risks early.

(b) Ensure immediate communication of information from local and intermediate levels to national levels as well as from any source identified at the national level.

(c) Verify the initial information (i.e., the signal).

(d) Document the nature of the event through investigation, characterization, etiological confirmation.

(e) Perform risk assessment to determine the level of risk posed by the detected event.

(f) Ensure immediate alert mechanisms from national and/or intermediate levels to local levels.

(g) Ensure prompt investigation as necessary and implement an adequate response through mitigation and control measures, as required by the continuous risk assessment.

(h) Alert and maintain communication/coordination with national/international stakeholders.

10.2.3 Critical components

During humanitarian crises, all functional static and mobile health facilities/clinics, including those in refugee camps for internally displaced persons (IDPs) which 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, the data collection and analysis processes need to be systematic and formal. Epidemic intelligence should be based on the two main IDSR event detection systems, namely:

i) Indicator-based surveillance (immediate and weekly reporting of data aggregated by health facilities)

ii) Event-based surveillance- the organized collection, monitoring, assessment and interpretation of mainly unstructured ad hoc information regarding health events or risks.

These complementary systems increase the sensitivity of IDSR to ensure timely detection and verification of outbreaks, and effective monitoring of morbidity patterns (WHO, 2012)

10.3 Implementation of IDSR in Humanitarian emergencies

10.3.1 Rapid assessment of the situation

During the acute phase of the emergency, it is necessary to undertake a systematic assessment of the risk of acute public health events. This involves gauging both the likelihood of a disease occurring and its eventual impact. The assessment can identify the epidemic-prone diseases that have the potential to cause the greatest amount of morbidity and mortality in the affected population, and determine the geographical scope of surveillance.

Assessment of the status of key surveillance infrastructure is also done. These include: existing surveillance capacity, identification of resource needs for IDSR implementation, including staff with relevant skills, communication and IT equipment laboratory support and other logistics. It should be based on consensus-building, analysis of existing data, establishment of working groups and conducting of in-depth interviews, as required. It should be based on an all-hazards approach and be embraced to guide the process 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, environment and review the strengths, weaknesses, threats and opportunities around the existing national surveillance system in order to identify available resources to reinforce IDSR. Gap analysis does not require a new or additional formal evaluation to be carried out. The results of previous evaluations of the surveillance system can be reused. In cases where not all of the information needed is available, focus groups or in-depth interviews with stakeholders at all levels of the surveillance system could be considered.

10.3.3 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. The objectives 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, intermediate and local 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 and county levels to ensure a single-entry point for reporting, triaging of information, verifying signals, analysis, assessing risks, monitoring and responding to acute public health events.

During acute or complex emergencies where the capacity of the national and county IDSR system in the MoH is greatly constrained, the roles and responsibilities of various actors may need to be reinforced.

10.4 Stakeholders in implementation of IDSR in Humanitarian Emergencies

10.4.1 National level

The overall coordination of data collection, entry, analysis and dissemination during public health crises should be undertaken by the Division of Disease Surveillance and Response (DDSR) in the Ministry of Health (MoH) with support from WHO and partners and submitted to the Public Health Emergency Operations Center (PHEOC). The county Public Health Emergency Management Committee (PHEMC) coordinated through the activated national PHEOC to support the coordination and response activities among the affected populations. The functions of the PHEOC will be guided by the initial rapid assessment and should include but not limited to:

(a) Providing dedicated technical oversight.

(b) Coordinating the supervision of surveillance and outbreak response activities in crisis among the affected populations.

(c) Guiding coordination of health workers and partners for effective disease surveillance and outbreak/public health response in crisis-affected populations.

(d) Supporting sub-counties or counties to investigate and respond to outbreaks or public health events including the reorientation of staff in IDSR.

(e) Conducting regular analysis of epidemiological trends and production of regular surveillance bulletins and situation reports.

(f) Providing aids for reporting and notifying priority diseases, conditions and events.

(g) Supporting evaluation.

10.4.2 County and Sub-County Level

The existing disease surveillance coordinators at County and Sub-County-level should coordinate surveillance and response activities among affected populations. However, during acute crises or complex emergencies where the local capacities are overwhelmed the national level in collaboration with the health cluster partners provide support to:

(a) Coordinate disease surveillance and outbreak response in crisis-affected populations.

(b) Ensure timely reporting of priority diseases, conditions and events related to the crisis.

(c) Conduct trend analysis and provide feedback to health facilities and clinics.

(d) Conduct initial investigation of disease outbreaks and public health events.

(e) Respond to disease outbreaks and public health emergencies in collaboration with National MoH, partners, and local health facilities.

10.4.3 Public and Private/Faith-Based health facilities or clinics

All identified focal persons working in health facilities or mobile clinics offering curative, preventive and health promotion services should implement the following:

(a) Detect, collect and report priority diseases, conditions and events using the MOH IDSR tools

(b) Support the verification and investigation of disease outbreaks and public health events.

(c) Undertake public health and outbreak response measures, with support from the community health volunteers, County and Sub County Disease Surveillance Coordinators and National Surveillance Officers.

10.5 Surveillance functions during an acute humanitarian emergency

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 prioritized in addition to the DDSR priority list. In identifying the list of 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:

(a) Epidemic.

(b) Vaccine preventable diseases due to disruption of immunization in most of the emergencies.

(c) Ability to cause severe morbidity or death.

(d) International surveillance requirements (IHR, 2005).

(e) Availability of prevention and control measures.

(f) Availability of reliable and meaningful case definitions and simple laboratory tests, where appropriate, it is critical that clinicians register the most accurate diagnosis per patient and that only new case visits are counted and not the follow-up visits.

The sources of data on new cases include:

(a) Outpatient clinics

(b) Inpatient records

(c) Laboratory records

(d) Mobile clinics in the community or from focal people identified from community

(e) IDP/refugee camp clinics

(f) Other sources of event-based information

10.5.2 Case definitions

For the diseases, conditions and events already included in the DDSR 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 IDSR case definitions.

10.5.3 Laboratory support

Quality assured WHO approved Point of care Rapid Diagnostic Test (RDT) kits for diseases like malaria, cholera, meningitis, hepatitis A and hepatitis E are essential for timely treatment and outbreak response decisions.

Laboratory confirmation is more critical for suspected outbreaks in affected populations and the following should be put in place to facilitate timely investigation of new outbreaks:

(a) Adequate stocks of outbreak and sample collection kits/SOPs (standard operating procedures) at the local level.

(b) Cold chain and shipping arrangements that are linked to the national specimen transportation network.

(c) Field or mobile laboratories that are set up to address the routine and outbreak laboratory testing needs of crisis-affected populations.

(d) Existing laboratories at national and county levels that have been strengthened to address the extra demands of the affected populations.

(e) Referral laboratories (national and international) should be identified to facilitate laboratory confirmation, antibiotic susceptibility testing and quality control.

(f) The existing IDSR laboratory and case investigation forms should be used for routine collection and reporting of laboratory aggregate and case-based data.

(g) 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, mobile clinics, laboratories, disease-specific active case search or outbreak investigations; community health workers, community alerts and other sources of disease surveillance data.

Health workers should observe the following standards:

(a) Strict adherence to the case definitions while collecting disease, conditions or event data.

(b) Each patient should be assigned one main diagnosis and counted once.

(c) New and follow-up visits should be coded separately in the health facility register.

The data collection will entail the following paper-based tools and/or electronic platforms:

(a) Kenya Health Management Information System (KHMIS) outpatient and inpatient

registers.

(b) IDSR immediate case-based and laboratory investigation form.

(c) IDSR weekly/monthly summary reporting form.

(d) Disease specific line listing forms.

(f) Generic or disease-specific case investigation forms.

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/HMIS reporting tools to capture diseases, conditions and events unique to crisis-affected populations. Consequently, the existing IDSR/HMIS paper-based tools and/or electronic reporting platforms should be updated to capture such additional diseases, condition, and public health events.

The reporting platforms (paper based and/or electronic) should provide for the following reporting timelines:

(a) Immediate reporting of epidemic-prone disease alerts.

(b) Daily reporting of aggregated and/or case-based data on priority diseases, conditions and events during the acute phase of the crisis and after a new outbreak is confirmed.

(c) Weekly reporting of aggregated data on priority diseases.

(d) Weekly line listing should be updated with community and health facility deaths and reported.

10.5.6 Data Analysis and Interpretation

The principles of data analysis utilized as part of the routine IDSR should be used in crisis- affected populations. Analysis on aggregated data is therefore conducted to document and describe disease trends and crossing of thresholds. The data is also used to calculate ratios and rates.

Before embarking on any analysis, data validation and cleaning should be undertaken for missing entries, outliers, and duplicates. The basic analysis entails case/death descriptive analysis by time, person, and place.

10.5.6.1 Morbidity indicators in crisis-affected populations include:

(a) Absolute counts of cases and deaths by priority disease.

(b) Incidence of disease (new cases by week divided by the total population) with a graph to

show trends from recent weeks. This can be disaggregated by location and person characteristics.

(c) Proportional morbidity (new cases of disease in a week divided by the new consultations in the week).

(d) Case Fatality Ratio (CFR) – the proportion of cases that die from a specific disease.

(e) Attack rate during outbreaks as the cumulative incidence of epidemic disease in a population over a period of time.

10.5.6.2 The mortality indicators in crisis affected populations

It is critical that mortality rates (CMR and U5MR) are monitored for affected populations to ensure that rates exceeding the established emergency threshold are detected and responded to promptly.

(a) Crude Mortality Rate (CMR) as deaths per 1 000 per day is calculated as the number of deaths divided by the population present during the period and the total number of days over which the deaths were reported.

(b) Under-five Mortality Rate (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 analysiss for both routine and case-based outbreak data thus saving time and ensuring analyzed 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 get timely feedback. Weekly surveillance summaries, bulletins and presentations should be presented and reviewed during:

(a) Weekly IDSR or outbreak committee meetings.

(b) Health, Water, Sanitation and Hygiene (WASH) and other relevant cluster meetings.

(c) Other relevant disease control meetings.

10.5.8 Support functions for surveillance in crisis-affected populations

The support functions include:

(a) Training of health care workers, surveillance focal persons or points and rapid response teams on surveillance functions including outbreak preparedness, investigation and response.

(b) Communication infrastructure (computers, phones, internet connectivity) based on local context and surveillance needs.

(c) Regular support supervision to enhance surveillance functions at all levels.

(d) Periodic evaluation (audit) to improve the performance of the surveillance system

10.5.9 Outbreak preparedness

Outbreak preparedness is paramount given the heightened risk of disease outbreaks in crisis- affected populations. Preparedness efforts should, as much as possible, be integrated in the existing national IDSR framework at national, county and sub-county levels with the Ministry of Health leading the efforts and supported by WHO and partners. However, during acute or complex emergencies where the capacities of the Ministry of Health are greatly compromised or diminished, the WHO, working with the health cluster partners should take lead in enhancing outbreak preparedness.

The key preparedness efforts in crisis-affected populations should entail the following:

(a) Strengthening existing or forming new multisectoral outbreak control teams at national and county, sub-county levels, with roles and responsibilities designated for each team member.

(b) Updating existing or developing new outbreak prevention and response plans that incorporate risks unique to crisis-affected populations.

(c) Development or updating (if necessary) of standard line-list forms for data collection during an outbreak.

(d) Development and distribution of standard treatment protocols for key diseases, with strategies for training of staff.

(e) Calculation of potential attack rates for epidemic-prone diseases, where possible.

(f) Pre-positioning stocks of essential treatment supplies to initiate outbreak control (e.g., oral rehydration salts, intravenous fluids, vaccination material, personal protective equipment, transport media for samples, water purification supplies, disinfectants, spray pumps and information leaflets on preventive measures for health staff or the community

(g) Strengthen laboratory capacity that should include:

i. Procurement of Sample collection Kits depending on the suspected event
ii. Procurement of Sample packaging kits for the priority diseases
iii. Resource mobilization for procurement of laboratory reagents, chemicals and other supplies
iv. Decentralization of laboratory functions to enable easy access for a short turn- around time for results.
v. Capacity building and re-orientation

(h) Identifying potential sites for quarantine, isolation and adequate treatment of patients, or for extra capacity, in the event of a surge in cases (e.g., a cholera treatment center)

(i) Implementing relevant prevention measures based on the risk assessment of diseases (e.g., measles and cholera vaccination, indoor-residual spraying of dwellings and distribution of long-lasting insecticide-treated nets to prevent outbreaks of measles, cholera, and malaria).

(j) Scaling up 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:

(a) Assess the severity of the humanitarian crisis based on the crude mortality rate (CMR)

and under five mortality rates (U5MR).

(i) The crude mortality rate threshold should be less than 1 death per 10 000 people per day.

(ii) The under-five mortality rate threshold should be less than 2 deaths per 10 000

children per day.

(b) Alert system for detecting possible outbreaks based on doubling of weekly incidence compared to the weekly average of previous 2-3 weeks.

(c) Detection of a case of potentially severe epidemic-prone disease like measles, polio, cholera, viral hemorrhagic fevers (VHF) or meningitis based on the IDSR alert and action thresholds specific to crisis-affected populations.

Once the thresholds are exceeded, verifications, investigations and response should be instituted promptly to prevent further morbidity and mortality

10.5.9.2 Alert verification

To minimize morbidity and mortality, alert verification should start immediately once the alert is received by county and national surveillance focal points (WHO, 2012). The verification can be done by telephone or site visit and can include the collection of information about:

(a) Cases based on standard case definitions (SCDs).

(b) Symptoms and signs (consider differential diagnoses).

(c) Date of onset of symptoms of the first and the most recently detected cases.

(d) Place and date seen or admitted at the health facility.

(e) Age, sex and vaccination status of patients, where relevant

(f) Place of residence at onset of illness.

(g) Where cases are occurring (community-level data)

(h) Geographical, personal and time relationships between cases.

(i) Laboratory capacity for prompt investigation of samples from suspected cases.

(j) Outcomes including, for example, deaths, case management details and the health-care staff 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 national and sub- national levels that have been established as part of the national IDSR framework. In acute and complex emergencies, dedicated and trained teams will be identified to undertake the investigations, which should follow existing IDSR outbreak investigation guidelines that have been adapted to address the unique needs of crisis-affected populations.

10.5.11 Outbreak response

Outbreak response should follow the existing national IDSR framework at national and sub- national levels with the country's existing structures leading the efforts. However, during acute or complex emergencies where the capacities of the Ministry of Health are greatly compromised or diminished, the WHO, should take lead in coordinating support from partners in implementation of outbreak response activities.

The additional risks in the crisis-affected populations will demand strengthening existing or formation of new multisectoral outbreak control teams at national and sub national 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.

10.5 Exit strategy

During the recovery phase of the crisis, the Ministry of Health will work with the WHO and other partners to re-establish all the IDSR structures and focal points in the crisis-affected populations. The Ministry of Health (MoH) should conduct an After-Action Review (AAR) to assess what happened, why it happened and document lessons learnt and gaps identified to inform the recommendations to prevent future occurrences.

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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES FOR KENYA

THIRD EDITION



SECTION 11: SUMMARY GUIDELINES FOR SPECIFIC PRIORITY DISEASES AND CONDITIONS

May 2022

SECTION 11: SUMMARY GUIDELINES FOR SPECIFIC PRIORITY DISEASES AND CONDITIONS

This section provides disease specific guidance to:

a) Take action to respond to alert and action (epidemic)thresholds for specific diseases
b) Identify surveillance goals and objectives for each priority disease
c) Identify surveillance data to analyze and interpret for each priority disease
d) Prepare to use the subcounty analysis workbook

The pages in this section provide summary guidelines for each of the priority diseases targeted forsurveillance. This section is intended as a rapid reference only. When further information is required, please use the detailed references listed in the summary. Kenya has adapted these guidelines of priority diseases from the WHO-AFRO suggested list depending on the local epidemiological situation.

ACUTE HEMORRHAGIC FEVER SYNDROME

Background

Acute hemorrhagic fever syndromes can be attributable to Ebola and Marburg viral diseases (filoviridae), Lassa fever (arenaviridae), Rift Valley fever (RVF) and Crimean-Congo hemorrhagic fever (CCHF) (bunyaviridae), dengue fever (dengue hemorrhagic fever (DHF)), yellow fever (flaviviridae) and other viral, bacterial or rickettsial diseases with potential to produce epidemics.

All cases of acute viral hemorrhagic fever syndrome whether single or in clusters, should be immediately notified without waiting for the causal agent to be identified.

Surveillance goal

Early detection of acute viral hemorrhagic fever syndrome cases and outbreaks, rapid investigation, and early laboratory verification of the etiology of all suspected cases.

Investigation of all suspected cases with contact tracing.

During epidemics, most infected patients do not show hemorrhagic symptoms and a specific case definitionaccording to the suspected or confirmed disease should be used (e.g., case definitions for Ebola-Marburg, CCHF, RVF, Lassa, DHF, and yellow fever).

Standard case definition

Suspected case: Acute onset of fever of less than 3 weeks duration in a severely ill patient AND any 2 of thefollowing; hemorrhagic or purpuric rash; epistaxis (nose bleed); hematemesis (blood in vomit); hemoptysis (blood in sputum); blood in stool; other hemorrhagic symptoms **and** no known predisposingfactors for hemorrhagic manifestations.

Confirmed case: A suspected case with laboratory confirmation or epidemiologic link to confirmed cases oroutbreak.

Note: During an outbreak, case definitions may be modified to correspond to the local event.

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the appropriate levels.
- Suspected cases should be isolated from other patients and strict barrier nursing techniques implemented. Standard precautions should be enhanced throughout the health care setting. (Referto **Annex 6K**)
- Treat and manage the patient with supportive care.
- Collect specimen safely to confirm the case.
- Conduct case-contact follow-up and active case search for additional cases.

Respond to action threshold

If a single case is confirmed:

- Maintain strict VHF infection control practices throughout the outbreak.
- Mobilize the community for early detection and care and conduct community education about how the disease is transmitted and how to implement infection control in the home care setting and during funerals.
- Conduct case-contact follow-up and active searches for additional cases that may not come to the health care setting.
- Request additional help from other levels as needed.

ACUTE HEMORRHAGIC FEVER SYNDROME

- Establish isolation ward to handle additional cases that may come to the health center.

Analyze and interpret data

Person: Implement immediate case-based reporting of cases and deaths. Analyze age and sex distribution.Assess risk factors and plan disease control interventions accordingly.

Time: Graph cases and deaths daily/weekly. Construct an epidemic curve during the outbreak.**Place**: Map locations of cases' households and work sites.

Laboratory confirmation

Diagnostic test	Presence of IgM antibodies against Ebola, Marburg, CCHF or Lassa *or* Presence of Ebola in post-mortem skin necropsy
Specimen	*For ELISA*: Whole blood, serum or plasma *For PCR*: Whole blood or blood clot, serum/plasma or tissue *For immunohisto-chemistry:* Skin or tissue specimens from *fatal* cases.
When to collect the specimen	Collect specimen from the first suspected case. If more than one suspected case, collect until specimens have been collected from 5 to10 suspected cases.
How to prepare, store, and transport the specimen	Handle and transport specimens from suspected VHF patients with extreme caution.Wear protective clothing and use barrier precautions. *For ELISA or PCR:* ▪ Refrigerate serum or clot ▪ Freeze (-20C or colder) tissue specimens for virus isolation *For Immunohistochemistry:* ▪ Fix skin snip specimen in formalin. Specimen can be stored up to 6 weeks. Thespecimen is not infectious once it is in formalin. ▪ Store at room temperature. Formalin-fixed specimens may be transported atroom temperature.
Results	Diagnostic services for VHF are available in CVR KEMRI. Advance arrangements areusually required for VHF diagnosis Contact the DDSR or CVR-KEMRI.

Reference

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- Viral Infections of Humans; Epidemiology and Control. 1989. Evans, A.S. (ed). Plenum Medical Book Company, New York

ACUTE JAUNDICE SYNDROME

Background

- Jaundice is not a common presentation, but it has the potential of developing into an outbreak situation hence importance of surveillance. There are many causes of Jaundice, e.g., Hepatitis virus, malaria, aflatoxicosis, Gall Bladder obstruction etc. All these diseases are of public health importanceand should be investigated.
- To differentiate acute jaundice from others of lesser public health importance, surveillance will focusonly on jaundice of less than 2 weeks duration.
- Some causes of jaundice can be diagnosed in the Sub-county lab by testing the blood of the patients.

Hepatitis:

- Enterically transmitted Hepatitis A Virus (HAV) and Hepatitis E Virus (HEV) are a worldwideproblem.
- Common source epidemics have been related to contaminated water and to contamination via infected food handlers.
- In general, both HAV and HEV are self-limiting viral infections; case fatality is normally low (0.1 –0.3%). Women in the third trimester of pregnancy are especially susceptible to fulminant HEV disease.
- Both HAV and HEV are transmitted via the faecal-oral route.
- Prevention and control measures for hepatitis A and hepatitis E include adequate supplies of safe- drinking water and improvement of sanitary and hygienic practices to eliminate faecal contaminationof food and water.

Viral hepatitis B and viral hepatitis C:

- Estimates indicate that worldwide, there are 350 million carriers of hepatitis B virus and 170 million carriers of hepatitis C virus.
- Hepatitis B and C epidemics are uncommon.
- Chronic infection and severe sequelae occur with hepatitis B – an estimated 15% to 25% of chronically infected persons will die prematurely of either cirrhosis or hepatocellular carcinoma. Chronic infection is common in hepatitis C and 5% to 20% of those infected with HCV may develop cirrhosis. There seems to be a connection between HCV infection and hepatocellular carcinoma.
- Hepatitis B is transmitted by percutaneous or per mucosal exposure to blood or other infectious bodyfluids. Major modes of transmission include sexual contact with an infected person, perinatal transmission from mother to infant, shared needles or syringes among injecting drug users, householdcontact (e.g., communally used razors and toothbrushes) and iatrogenic exposure (transfusions, unsafe injection practices). In most countries where HBV is highly endemic, most infections occur during infancy and early childhood.
- Hepatitis C is transmitted by parenteral exposure to blood and plasma derivatives. It is found in highest concentrations in blood. The major causes of HCV infection worldwide are use of unscreened blood transfusions and re-use of needles and syringes that have not been adequately sterilised.
- Prevention and control measures for hepatitis B and C include transfusion safety, safe and appropriate use of injections and hepatitis B vaccination.
- There is no specific treatment for acute viral hepatitis A, B, C and D.

Clinical Description: A New Patient with an acute illness (less than 4 weeks) and with the following symptoms:

- Yellowness of the eyes, dark urine, anorexia, malaise, extreme fatigue and sometimes pain in the right abdominal quadrant

Health Education: Health education is the most effective prophylactic measure and should be mainly directed at early reporting and prompt treatment, importance of safe water, hygienic food practices andpersonal hygiene.

Aflatoxicosis:

Aflatoxicosis in humans is associated with the consumption of aflatoxin from food contaminated with the

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mould Aspergillus flavus. A number of aflatoxins with a range of potency (B1, G1, B2, G2) are produced by Aspergillus, the relative proportions depending on the species of mould. Jaundice, fever, ascites, oedema of the feet, and vomiting are the symptoms associated with aflatoxicosis.

Outbreaks of acute aflatoxin poisoning are a recurrent public health problem. In 2004, one of the largest, most severe aflatoxicosis outbreaks occurred in Kenya followed by another outbreak in 2005. The Kenya outbreaks are likely to be an underestimation of the problem; furthermore, the burden of disease attributable to chronic aflatoxin exposure (e.g. hepatocellular carcinoma, impaired growth, immune suppression) remains undefined.

The major sources of exposure are maize and groundnuts as these are the foods that are most susceptible to contamination and consumed in the greatest amounts. The greatest risk for health impact lies within developing countries located in tropical regions, which rely on these commodities as their staple food source. Food insufficiency and lack of diversity substantially contribute to the susceptibility of individualsand communities to aflatoxins. Many factors affect the growth of Aspergillus fungi and the level of aflatoxin contamination in food. Contamination can occur at any stage of food production from pre- harvest to storage. Factors that affect aflatoxin contamination include the climate of the region, the genotype of the crop planted, soil type and minimum and maximum daily temperatures

Surveillance goal

- Detect hepatitis outbreaks.
- Detect aflatoxicosis outbreak
- Identify areas/populations at high risk to target prevention and control measures.
- Estimate burden of disease.
  NB. If countrywide surveillance is not possible, surveillance in sentinel areas or hospitals may provideuseful information on potential sources of infection.

Standard case definition

Suspected case: Any person presenting with acute onset (within 14 days) of yellowness of eyes/skin withor without fever.

Confirmed case: A suspected case whose samples have:

- Turned positive for hepatitis virus,
- Turned positive for aflatoxin or
- Suspect who has consumed foods/grains confirmed to be contaminated with aflatoxins

Respond to alert threshold

If hepatitis cases are suspected:

- Report case-based information to the appropriate levels.
- As necessary, treat and manage the patient(s) with supportive care.
- Collect specimens and send to laboratory to identify the etiology of the illness
- Other measures include:
  - Immediate provision of safe drinking water - steps must be taken to provide safe water to the community for drinking and cooking. Chlorine tablets may be distributed to all households so that they may chlorinate their drinking water themselves.
  - All water sources for human consumption in the community should be chlorinated with chlorine.Residual chlorine should be ensured before this water is used.
  - Health education of the community to boil drinking water if feasible may be resorted to.
  - Provision of safe water is the responsibility of the dept of water supply and should be co- ordinated by the BDO / CEO / Collector. However, the health department should be involved in this measure and should advise the water supply department about the areas to be targeted.
  - **Sanitary disposal of human waste:** The community should be educated on the need for observingsanitary practices.
  - The importance of handwashing after visiting the toilet must be emphasized.

If aflatoxicosis is suspected:

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- Collect blood serum for laboratory confirmation
- Institute case management
- Collect food samples
- Active surveillance for more cases

Respond to Action Threshold

If hepatitis cases are confirmed:

- Inform the DDSC/DMOH
- Initiate case management.
- Determine mode of transmission
- Identify population exposed to risk of infection
- Eliminate common source(s) of infection
- Implement appropriate prevention and control interventions:
  - Disinfection of drinking water sources
  - IEC to promote hygienic measures
  - Informing the local practitioners about the possibility of an outbreak.
  - In areas, that are endemic for Falciparum malaria, blood smears for malaria parasites need to betaken from the cases.
  - If Hepatitis A or E is suspected, then water is taken for microbiological analysis.
  - Support the County/sub-county team during outbreak investigation

If aflatoxicosis cases are confirmed:

- Seize and sample all foods of questionable standards
- Confiscate and destroy all aflatoxin contaminated foods
- Involve other stakeholders e.g., Ministry of Agriculture, administration
- Create public awareness
- Active surveillance
- Systematic sampling of all aflatoxin susceptible grains in the food chain in the country.

Analyze and interpret data

Time: Graph cases and deaths.

Place: Plot location of case households. Incidence by geographical area

Person: Count monthly cases and deaths.

NB. Data will be compiled on monthly basis. During outbreak periods data should be compiled andsubmitted weekly.

Threshold levels for action:

- If there are more than 2 cases of jaundice in a village or an urban unit (of 1000 population) within aweek.
- A single case of death due to acute jaundice (jaundice of less than 2 weeks)

Laboratory confirmation

For hepatitis: Confirm by serological testing of surface antigens or IgMs of the respective hepatitis virus.

For aflatoxicosis:

- Take blood samples from cases for aflatoxin levels
- Take suspected food samples
- Use rapid diagnostic kits
- Use chromatographic techniques

Reference

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- WHO Recommended Strategies for Prevention and Control of Communicable Diseases; WHO/CDS/CPE/SMT/2001.13
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ACUTE VIRAL HEPATITIS

Background

Viral hepatitis A and viral hepatitis E:

- Enterically transmitted HAV and HEV are a worldwide problem.
- Common source epidemics have been related to contaminated water and to contamination viainfected food handlers.
- In general, both HAV and HEV are self-limiting viral infections; case fatality is normally low (0.1 – 0.3%). Women in the third trimester of pregnancy are especially susceptible to fulminantHEV disease.
- Both HAV and HEV are transmitted via the faecal-oral route.
- Prevention and control measures for hepatitis A and hepatitis E include adequate supplies ofsafe-drinking water and improvement of sanitary and hygienic practices.

Viral hepatitis B and viral hepatitis C:

- Worldwide, there are 350 million carriers of hepatitis B virus and 170 million carriers ofhepatitis C virus.
- Hepatitis B and C epidemics are uncommon.
- Chronic infection and severe sequelae occur with hepatitis B. An estimated 15% to 25% of chronically infected persons will die prematurely of either cirrhosis or hepatocellular carcinoma.
- Chronic infection is common in hepatitis C and 5% to 20% of those infected with HCV may develop cirrhosis. There seems to be a connection between HCV infection and hepatocellular carcinoma.
- Hepatitis B is transmitted by percutaneous or per mucosal exposure to blood or other infectiousbody fluids. Major modes of transmission include sexual contact with an infected person, perinatal transmission from mother to infant, shared needles or syringes among injecting drug users, household contact (e.g., communally used razors and toothbrushes) and nosocomial exposure (transfusions, unsafe injection practices). In most countries where HBV is highly endemic, most infections occur during infancy and early childhood.
- Hepatitis C is transmitted by parenteral exposure to blood and plasma derivatives. It is found inhighest concentrations in blood. The major causes of HCV infection worldwide are use of unscreened blood transfusions and re-use of needles and syringes that have not been adequately sterilised.
- Prevention and control measures for hepatitis B and C include transfusion safety, safe and appropriate use of injections and vaccination (hepatitis B).

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- There is no specific treatment for acute viral hepatitis A, B, C and D.

Surveillance goal

- Detect hepatitis outbreaks.
- Identify areas/populations at high risk to target prevention and control measures.
- Estimate burden of disease.
- If countrywide surveillance is not possible, surveillance in sentinel areas or hospitals mayprovide useful information on potential sources of infection.

Standard case definition

Suspected case: Any person with acute illness typically including acute jaundice, dark urine, anorexia,malaise, extreme fatigue, and right upper quadrant tenderness. (Note: infected children are often asymptomatic.)

Confirmed case: A suspected case that is laboratory confirmed

Respond to alert threshold

If hepatitis cases are suspected:

- Report case-based information to the appropriate levels.
- As necessary, treat and manage the patient(s) with supportive care.
- Collect specimens and send to laboratory to identify the etiology of the illness

Respond to action threshold

If hepatitis cases are confirmed

- Determine mode of transmission
- Identify population exposed to risk of infection
- Eliminate common source(s) of infection
- Implement appropriate prevention and control interventions

Analyze and interpret data

Time: Analysis of suspected and confirmed cases by week. Graph cases and deaths weekly. Constructan epidemic curve during outbreaks.

Place: Plot location of case households.

Person: Analyze by age and gender. Assess risk factors to plan and monitor prevention and controlmeasures.

Laboratory confirmation

Diagnostic test	**Hepatitis A:** IgM anti-HAV positive **Hepatitis B:** +ve for Hepatitis B surface antigen (HbsAg) or IgM anti-HBc positive**Hepatitis C:** Anti-HCV positive **Hepatitis D:** HBsAg positive or IgM anti-HBc positive plus anti-HDV positive (onlyas co-infection or super-infection of hepatitis B) **Hepatitis E:** IgM anti-HEV positive and/or IgG anti-HEV positive
Specimen	Serum
When to collect the specimen	Specimens should be collected from suspected patient. IgM anti-HAV becomes detectable 5-10 days after exposure. HBsAg can be detected in serum from several weeks before onset of symptoms todays, weeks or months after onset; it persists in chronic infections. IgM anti-HBcpositive usually disappears within 6 months.
How to prepare, store and transport the	Use universal precautions to minimize exposure to sharps and any body fluid. Collect 5-10 ml of venous blood. ▪ Let clot retract for 30 to 60 minutes at room temperature or centrifuge to

ACUTE VIRAL HEPATITIS

specimen	separate serum from red blood cells. ▪ Aseptically pour off serum into sterile, screw capped tubes. ▪ Store serum at 4°C. ▪ For storage >5 days, samples are held at -20°C ▪ Transport serum samples using appropriate packaging to prevent breakage or leakage.
Results	Results are usually available within one to 3 days from arrival in the laboratory.

Reference

- WHO Recommended Strategies for Prevention and Control of Communicable Diseases; WHO/CDS/CPE/SMT/2001.13
- WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2
- WHO Fact Sheet No 328, Hepatitis A, revised May 2008.
- WHO Fact Sheet No 204, Hepatitis B, revised August 2008
- WHO Fact Sheet No 164, Hepatitis C.
- WHO Fact Sheet No 280, Hepatitis E, revised January 2005.
- World Health Organization
- http://www.who.int/topics/hepatitis/en/
- United States, Centers for Disease Control and Prevention
- http://www.cdc.gov/hepatitis/
- Control of Communicable Diseases Manual, 18th Edition

ADVERSE EVENTS FOLLOWING IMMUNIZATION (AEFI)

Background

Reports of AEFIs have had negative effects on national immunization programmes. Most reports are "coincidental" events not related to vaccines. It is important to identify real events and determine their cause.

Surveillance goal

To determine the cause of an AEFI or cluster of AEFIs and correct it.

Standard case definition

A medical incident that takes place after vaccination causes concern and is believed to be caused by thevaccination.

Respond to alert threshold

If a single case is suspected:

- Treat the patient
- Communicate with the parents and community
- Respond to rumours or public enquiries
- Complete case investigation form

Respond to action (epidemic) threshold

If a single case is confirmed:

- Monitor for a cluster
- Send report immediately to initiate investigation of cause
- Take remedial action to avoid another AEFI occurring from the same cause

ADVERSE EVENTS FOLLOWING IMMUNIZATION (AEFI)

Analyze and interpret data

Determine the cause of the event. Is it programme-related, Vaccine-induced, coincidental or unknown?Beware of mass psychological illness if a number of school-aged or older individuals are involved at thesame time.

Reference

1. Surveillance of adverse events following immunization. Field guide for managers of immunization programmes. WHO/EPI/93.02 Rev 1. http://www.who.int/vaccines- documents/DocsPDF/www9541.pdf
2. Kharabsheh S. Mass psychogenic illness following Td vaccine in Jordan. Bulletin of the WHO 2001.79 (8); 764-770. http://www.who.int/bulletin/pdf/2001/issue8/vol79.no.8.764-770.pdf

ANTHRAX (HUMAN)

Background

- Anthrax is a widespread zoonotic disease caused by the spore-forming bacterium *Bacillus anthracis*, a Gram positive rod-shaped bacterium. It is transmitted from infected domestic livestock (cattle, sheep, goats, pigs and others) or wild game animals to humans by direct contact or indirect contactwith animals or their products.
- The incubation period typically ranges from 1 to 7 days, but may be longer (up to two to three weeks for cutaneous anthrax and up to 42 days for inhalation anthrax). Persons exposed to occupational hazards include those handling infected carcasses and those employed in the processingof bones, hides, wool and other animal products. Persons may also become infected by handling orconsuming meat from animals that are sick with or have died of the disease. Biting flies have been reported to transmit the disease from infected animals to humans however how readily or often thisoccurs is unknown. Human anthrax is a serious problem in several countries and has potential for explosive outbreaks (especially the gastrointestinal form that is contracted from eating infected meat); while pulmonary (inhalation) anthrax is mainly occupational. The threat of biological warfare attacks should not be forgotten. Anthrax has a serious impact on the trade of animal products.
- The control of anthrax is based on its prevention in livestock. Programmes based only on preventionin humans are costly and likely to be ineffective except for those industrially exposed.
- There is an effective vaccine for those persons considered at-risk for occupational exposure, and effective vaccines are available for livestock, particularly for herds with ongoing exposure to contaminated soil or vegetation.
- In Kenya anthrax is a notifiable disease.

Surveillance goal

- To detect outbreaks.
- To monitor control and prevention programmes

Standard case definition

Suspected case: Any person with an acute onset illness characterized by several clinical forms which are:

a) ***Cutaneous form****:* Any person with skin lesion evolving over 1 to 6 days from papular through vesicular stage, to a depressed black eschar invariably accompanied by oedema that may be mildto extensive
b) ***Gastro-intestinal*****:** Any person with abdominal distress characterized by diarrhoea, nausea,

vomiting, anorexia and followed by fever

c) **P*ulmonary (inhalation)*:** any person with brief prodrome resembling Severe acute respiratoryillness, followed by rapid onset of dyspnoea, hypoxia, and high temperature, with X-ray evidence of mediastinal widening

d) ***Meningeal*:** Any person with acute onset of high fever possibly with convulsions, loss of consciousness, meningeal signs and symptoms; commonly noted in all systemic infections, but may present without any other clinical symptoms of anthrax.

AND has an epidemiological link to confirmed or suspected animal cases or history of handling contaminated animal products

Confirmed case: A clinically compatible case of cutaneous, inhalational or gastrointestinal illness that is laboratory-confirmed by:

(a) Isolation of *B. anthracis* from an infected tissue or site or sample.or

(b) Other laboratory evidence of *B. anthracis* infection based on at least two supportive laboratorytests. (ELISA/PCR)

Note: it may not be possible to demonstrate B. anthracis in clinical specimens if the patient has beentreated with antimicrobial agents.

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the appropriate levels (public health sector DDSR and Department of veterinary services)
- Use standard barrier precautions for all forms. Use protective equipment and clothing (gloves, gowns, face shields), and respiratory protection if there is a risk of aerosols; disinfection and dressing any cuts and abrasions before putting on protective clothing.
- Perform environmental disinfection with 10% chlorine solution.
- Treat and manage the patient with supportive care and using antibiotics such as Penicillin V,procaine penicillin (uncomplicated cases), or penicillin G (severe cases)
- Collect appropriate specimen safely to confirm the case.
- Conduct joint (public health and animal health sectors) investigation of cases/deaths
- Strengthen animal vaccination activities to prevent inter-sub-counties transmission.
- In humans, selective preventive vaccination may be considered in case of occupational exposure

Respond to action threshold

If a single case is confirmed:

- Standard infection control precautions are sufficient and should be used when managing the patients
- Particular attention should be paid to body fluid spills which should be managed by cleaning and decontamination (**Annex 6K)**. This should be done promptly and thoroughly, because organismswhich remain on surfaces may form spores which are also infectious.
- As is usual practice, personal protective equipment should be used in situations where there is potential for splashes and inoculation injuries. Any incidents should be reported immediately
- Mobilize the community for early detection and care.
- Conduct community education about the confirmed case, how the disease is transmitted, and how to prevent infection at home.
- Conduct active searches for additional cases that may not come to the health care setting.

ANTHRAX (HUMAN)

- Provide information about prevention in the home and when and where to seek care.
- Burry bodies and carcasses properly or cremate (if practiced).

- NB: Animals should not be opened if anthrax is suspected
- Request additional help from national level as needed.

Analyze and interpret data

Time: Graphs of number of suspected / probable / confirmed cases by date.

Place: Map of suspected and confirmed human and animal cases by geographical area

Person: Table showing the number of suspected / probable / confirmed cases by date, age and sex

Laboratory confirmation

Diagnostic test	Isolation of *Bacillus anthracis* from a clinical specimen (e.g., blood, lesions, discharges) Demonstration of *B.anthracis* in a clinical specimen by microscopic examination ofstained smears (vesicular fluid, blood, cerebrospinal fluid, pleural fluid, stools) Positive serology (ELISA, Western blot, toxin detection, chromatographic assay,fluorescent antibody test)
Specimen	**Cutaneous** ▪ For vesicular lesions, two swabs of vesicular fluid from an unopened vesicle ▪ For eschars, the edge should be lifted and two swab samples rotated underneath ▪ For ulcers, the base of the lesion should be sampled with two saline moistenedswabs ▪ Blood cultures obtained prior to antimicrobial therapy, if the patient has evidence of systemic symptoms. ▪ A full thickness punch biopsy of a papule or vesicle including adjacent skin should be obtained from all patients with a lesion being evaluated for cutaneous anthrax, to be submitted in 10 percent formalin for histopathology. ▪ In patients not on antibiotic therapy or on therapy for <24 hours, a second biopsy specimen may be taken. ▪ Acute and convalescent serum samples for serologic testing. **Gastro-intestinal** ▪ Blood cultures obtained prior to antimicrobial therapy. ▪ Ascites fluid for culture and PCR. ▪ Stool or rectal swab for culture and PCR. ▪ Oropharyngeal lesion, if present, for culture and PCR. ▪ Acute and convalescent serum samples for serologic testing. ▪ Autopsy tissues from fatal cases for histopathology.**Stool** ▪ Collect 5-10 g in a clean sterile leak-proof container **Blood** ▪ Collect per institution's procedure for routine blood culture. ▪ Collect 10 ml of blood in EDTA for PCR **Inhalation** ▪ Blood cultures obtained prior to antimicrobial therapy. ▪ Pleural fluid, if present, for culture and PCR.

	▪ CSF, in patients with meningeal signs, for culture and PCR. ▪ Pleural and/or bronchial biopsies for IHC. ▪ Acute and convalescent serum samples for serology ▪ Autopsy tissues from fatal cases for histopathology
When to collect the specimen	▪ Specimens should be collected from any patient being evaluated for cutaneousanthrax. ▪ Specimens for culture should be obtained prior to initiation of antimicrobial therapy as it may not be possible to demonstrate *B. anthracis* in clinical specimens if the patient has been started treatment. Organism is best demonstrated in specimen taken at the Vesicular stage ▪ If available at reference laboratories specimens may be submitted for PCR **Caution: *B. anthracis* is highly infectious**
How to prepare, store and transport specimen	**Vesicular stage**: collect fluid from intact vesicles on sterile swabs. **Eschar stage**: Store swabs for ≤24 h and transport within ≤2h at room temperature. **Stool**: collect 5-10 g in a clean sterile leak-proof container. If not possible to deliver tolaboratory immediately, may be stored for ≤24 h at 4°C then transport within 1h at room temperature. **Blood**: collect per institution's procedure for routine blood culture. Collect 10 ml ofblood in EDTA for PCR. Transport within 2h at room temperature. **Sputum**: collect specimen into a sterile leak proof container. If not possible to deliverto laboratory immediately, may be stored for ≤24 h at 4°C then transport within 1hat room temperature. .
Results	Diagnostic capacity for Anthrax may not be available in most counties. Assistance fromCMR KEMRI should be sought. Contact the head DDSR and Department of Veterinary Services.

Reference

- WHO. Anthrax in humans and animals. World Health Organization, Geneva. (2008) (Availableon http://www.who.int/csr/resources/publications/ AnthraxGuidelines2008/en/index.html
- WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2
- WHO recommended Strategies for the Prevention and Control of Communicable Diseases, WHO/CDS/CPE/SMT/2001.13
- 2003 WHO Manual for Laboratory Diagnosis of Anthrax (http://www.searo.who.int/en/Section10/Section17/ Section58/Section909.htm)
- "CDC: Anthrax Information for Health Care Providers" (http://emergency.cdc.gov/agent/anthrax/anthrax-hcp-factsheet.asp)
- "CDC: Recommended Specimens for Microbiology and Pathology for Diagnosis: Inhalation, Cutaneous, and Gastrointestinal Anthrax" (http://emergency.cdc.gov/agent/anthrax/lab-testing/recommended_specimens.asp)

BRUCELLOSIS

Background

- Brucellosis is the most widespread zoonosis transmitted from animals (cattle, sheep, goats, pigs, camels and buffaloes), through direct contact with blood, placenta, foetuses or uterine secretions, orthrough consumption of infected raw animal products (especially milk and milk products).
- Human brucellosis due to *Brucella melitensis* has serious public health consequences in areas wheresheep and goat are raised. Brucellosis has an important worldwide impact on human health and the animal industry.
- In most countries brucellosis is a notifiable disease. Control measures are based on prevention. Surveillance is a key element for management of prevention and control programmes.
- Recommended types of surveillance:
  - Routine surveillance must be undertaken, particularly among high-risk groups (farmers, shepherds, workers in slaughterhouses, butchers, veterinarians, laboratory personnel).
  - Early case-based reporting to appropriate levels is mandatory.
  - In endemic countries where investigation of all reported cases may not be feasible, a representative proportion of reported cases should be investigated routinely.
- Special aspects
  - The surveillance activities of both MOH and DVS should be fully coordinated and integrated. Administrative arrangements between the two sectors must be established to facilitate immediate cross-notification of cases, as well as joint investigations.
  - Surveillance and control programmes must be promoted in livestock keeping communities.

Surveillance goal

- Early case detection
- Mapping of high-risk areas
- Document epidemiological data
- Improving laboratory diagnosis and reporting
- Synchronize control programs between human and animal health sectors.
- Aggregate data for reporting by number of cases, age, sex and type of diagnosis.

Standard case definition

Clinical description: An illness characterized by acute or insidious onset, with continued, intermittent orirregular fever of variable duration, may have profuse sweating particularly at night, fatigue, anorexia, weight loss, headache, arthralgia generalized aching, arthritis/spondylitis, meningitis, or focal organ involvement (endocarditis, orchitis/epididymitis, hepatomegaly, splenomegaly).

Suspected Case: A case that is compatible with the clinical description **and** is epidemiologically linked tosuspected or confirmed animal cases or contaminated animal products.

Probable: A suspected case that has a positive Rose Bengal test or a clinically compatible case with at least one of the following:

- Epidemiologically linked to a confirmed human or animal brucellosis case
- Presumptive laboratory evidence (*Brucella* total antibody titer >160 by standard tube agglutination test (SAT) or *Brucella* microagglutination test (BMAT) in one or more serum specimens obtained after onset of symptoms), but without definitive laboratory evidence of *Brucella* infection.

Confirmed Case: Patient with

- Culture and identification of *Brucella* spp. from a clinical specimen, or
- Evidence of a fourfold or greater rise in *Brucella* antibody titer between acute and convalescent-phase serum specimens obtained two or more weeks apart.

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the appropriate levels (DDSR and Department ofveterinary services)

BRUCELLOSIS

- Arrange for laboratory testing of blood samples
- Report and investigate all suspected outbreaks of brucellosis
- Search for source of infection in collaboration with Department of Veterinary Services
- Treat patients with appropriate antibiotics (use drug of choice)

Respond to action threshold

If a single case is confirmed:

- Identify areas/populations at high risk to identify source (s) and modes of transmission inorder toprevent and control the disease
- Conduct health education programs with simple messages on how to make dairy and other animalproducts safe for human consumption
- Mount control measures in collaboration with animal health experts.

Analyze and interpret data

Time: Graph cases and deaths.

Place: Plot location of case households. Incidence by geographical area**Person:** Count weekly/monthly cases and deaths.

Tables: Incidence by age, sex, type of diagnosis, risk group, by clinical features, by month/year.

NB. Data will be compiled monthly. During outbreak periods data should be compiled and submittedweekly.

Surveillance data

- Estimate the magnitude of the problem in humans and animals
- Monitor the distribution of the disease in humans and animals
- Monitor and evaluate impact of prevention activities in humans, and of control measures in animals

Investigation data

- Identify populations at-risk
- Identify potentially contaminated animal products
- Identify potentially infected herds or flocks of animal.

Laboratory confirmation

Probable:

- ELISA (IgA, IgM), 2-mercaptoethanol test, complement fixation test, Coombs, fluorescent antibody test (FAT), and radio-immunoassay for detecting antilipopolysaccharide antibodies; and counterimmunoelectrophoresis (CIEP)
- Fourfold or greater rise in *Brucella* antibody titer between acute- and convalescent-phase serum specimens obtained two or more weeks apart.
- Brucella agglutination titre (e.g., standard tube agglutination tests: SAT>160) in one or more serumspecimens obtained after onset of symptoms

Confirmed:

- Culture and identification of *Brucella* spp. from a clinical specimen, or
- Detection of *Brucella* DNA in a clinical specimen by PCR assay.

CANCERS (GENERAL)

Background

- Cancer is a multifaceted disease known to be caused by both Internal and external risk factors including tobacco, alcohol, numerous chemical substances, radiation, and some infectious organisms.
- Cancer is the generic term for a large group of diseases in which cells grow out of control and can spread to other parts of the body. Cancer involves a series of mutations or changes in the genetic makeup of a cell, causing it to look and function differently from normal cells.
- Internal factors which may predispose one to cancer include inherited genetic mutations, hormone imbalances, Immune disorder conditions and some metabolic disorders. (KEMRI, Cancer Incidence Report- 2006).
- Statistics in Kenya has shown that about 50 Kenyans die daily from various forms of cancers.
- About 80,000 cases of cancer are diagnosed each year in Africa and Asia (Pact Kenya 2010).
- According to International Atomic Energy Agency (2010), the Cancer situation in Kenya is dire with asevere lack of Medical Practitioners and a large number of new Cancer cases being diagnosed annually.
- A study by KEMRI (2010), found that of the 2,292 Cancer-related deaths recorded in Nairobi during a two-year period, Oral tumours claimed the biggest percentage of victims. This report also indicatesthat people who develop a Liver condition called Cirrhosis, in many cases caused by too much alcohol and Hepatitis B and C viruses can develop liver cancer. The study also states that women who take more than three alcoholic drinks a day increase their risk of Breast Cancer. In addition, in the Kenya Medical Research Institute Study (2008), further found out that Cancer Treatment is improving in the developed world.
- An article published in Global Medicine (2011), States that the incidence of Cancer in Kenya is on therise, with over **82,000 new cases** reported annually. Kenyatta National Hospital, the only Public institution that hosts most of the Cancer Experts and Technology in Kenya, is currently overwhelmedwith Inpatient and Outpatient Cases and simply cannot cope.
- Cancer ranks third among the main causes of death in Kenya after infections and cardiovascular diseases.
    - The common types of Cancer for Women are **Breast** and **Cervix Cancer**.
    - Men are affected by the following types of Cancer: **Oesophagus, Neck and Prostate** cancers.
    - In children the commonest Cancers are **Blood cancer (Leukaemia) and Lymphomas**.
- Cancer accounts for up to **18,000 deaths** annually in Kenya; up to 60 per cent of those who die arein the most productive years of their life.
- Among men, Prostate Cancer has assumed unbearable proportions.
- Every 4th February, the World marks the World cancer day.

Surveillance goal

The Cancer Surveillance System (CSS) collects population-based data on cancer incidence and survival in 13 counties in western Washington State. These cancer data are collected to provide public healthscientists and practitioners with the ability to:

- Track trends in the incidence of all forms of cancer (surveillance);
- Identify and investigate patterns of cancer occurrence (epidemiology); and,
- Monitor of trends in mortality and survival for specific cancers (end results).

Cancer surveillance provides a quantitative portrait of cancer and its determinants in a definedpopulation. The core functions of cancer surveillance are the measurement of cancer incidence, morbidity, survival, and mortality for persons with cancer. It also includes the assessment of genetic predisposition, environmental and behavioural risk factors, screening practices, and the quality of care from prevention through palliation. Cancer surveillance tells us where we are in the effort to reduce the

CANCERS (GENERAL)

cancer burden and also generates the observations that form the basis for cancer research andinterventions for cancer prevention and control.

Reference

- http://www.fhcrc.org/about/index.html
- http://surveillance.cancer.gov/about/
- Futures Report, September 2001, a collaboration among the National Cancer Institute, the National Center for Health Statistics, the Centers for Disease Control and Prevention, the American Cancer Society, and the North American Association of Central Cancer Registries.

CANCERS (BREAST CANCER)

Background

- Breast cancer is the most common form of cancer in women worldwide. Breast cancer also affects men, though to a lesser extent. In the year 2000, there were 1,050,346 cases of breast cancer reported worldwide with 372,969 deaths. Most of these were in developed countries.
- Breast cancer in Kenyan women occurs more commonly in younger women (aged 40 to 49 years) compared to the West where the peak prevalence is between 50 and 59 years. In addition, most patients in Kenya present at late stages of the disease. When screening and detection are regularly and correctly performed, and timely treatment is provided, breast cancer is associated with a good prognosis. Unfortunately when diagnosis is made late, breast cancer is associated with poor outcome.
- One of the contributing factors to late presentation is lack of awareness about early detection of breast cancer. The community needs to be sensitised and educated on how to detect breast lumps early.
- The breast is quite accessible because of its anatomical location on the external surface of the chest. Itis therefore easy to detect changes early through simple observation and manual breast examination.These simple procedures that can be performed by individuals on their own breasts or by a health care provider at any level of health facility help pick up lumps when they are still small.
- Other advanced screening procedures such as mammography and fine needle aspiration and cytology(FNAC) are carried out in higher levels of health care

RISK FACTORS

- The specific cause of breast cancer is unknown. Most of the risk factors (approximately 90%) are thought to be modifiable and are mainly environmental and life-style related; while the rest (5 to 10%) are genetic. Women who inherit a mutated breast cancer gene (BRCA-gene) from either parenthave 85-90% chance of developing breast cancer. The major risk factors include:
  - Female sex
  - Age
  - Family history of breast cancer
  - Prolonged exposure to oestrogens
- Other related factors include: hormone replacement therapy, ionizing radiation, high-fat diet, lack ofphysical exercise, obesity, alcohol and family history of other cancers such as ovarian, prostate, colorectal and endometrial.

Surveillance goal

- Early detection and intervention for the most at-risk population
- Estimate the magnitude of the disease
- Monitor prevention and control program activities

Standard case definitions

CANCERS (BREAST CANCER)	
Suspected case: Any person presenting with one or more of the following: palpable mass in the breast,pain in the breast, blood or pus discharge from the nipples, changes in the breast skin texture and appearance, ulceration, enlargement of the axilllary lymph nodes. To be refined later. DRH to be contacted. Or any person presenting with a lesion on routine breast examination including Mammography ***Confirmed case:*** Suspected case confirmed by histological methods	
Respond to alert threshold	
▪ Promote early detection by supporting interventions to address risk factors ▪ Facilitate advocacy through IEC to the at-risk population ▪ Encourage screening by self-breast examination, clinical breast examination, breast ultrasound and mammography.	
Respond to action threshold	
▪ Ensure treatment is carried out according to the guidelines	
Analyze and interpret data	
Time: Graph cases monthly to analyze trends **Place: C**ompare sub-county trends with national and regional trends **Person:** Analyze the distribution of cases by age and other demographic factors.	
Screening	
▪ Breast Self-Examination (BSE) ▪ Clinical Breast Examination (CBE) ▪ Breast imaging (mammography and/or ultrasound scanning).	
Laboratory confirmation	
Diagnostic test	Cytology Histology
Specimen	▪ Fine needle aspirate to extract breast tissue fluid or cells ▪ Core biopsy to extract breast tissue ▪ Incisional biopsy to remove a part of a breast lump ▪ Excision biopsy to remove a whole breast lump
When to collect specimen	Anytime abnormal breast pain, or an abnormal breast shape or discharge is seen,or an abnormal breast area or swelling is seen upon screening
How to prepare, store, and transport	▪ Every breast excision specimen should be delivered to the pathologist intact. Ifthe specimen has been incised previously or fragmented, evaluation of the surgical margins will not be possible. ▪ The specimen should be oriented and marked by the surgeon using sutures. These suture marks should be documented clearly for the pathologist in the pathology request form. ▪ Ideally, specimens should be transported fresh (in a plastic bag or container onice) to the laboratory, to enable the pathologist to examine and mark the margins, and slice the specimen prior to fixation. ▪ However, when immediate transport is not practical, for: o FNA specimen: Smear the aspirate on a clean slide and wet-fix by alcoholspray or by immersion in alcohol o Tissue specimen: Immediately place in formalin (at least twice the specimen volume). The container should be large enough to ensure that no distortion of the specimen occurs.

CANCERS (BREAST CANCER)	
	▪ As a guide, a specimen left at room temperature for 30 minutes may commence autolysis and compromise hormone receptors results as well as pathology assessment. ▪ Surgeons should not use diathermy as the thermal injury can produce cauteryartefact.
Results	These will be provided by the pathologist. Together with clinical examination,these will be used to stage the breast cancer.
Reference: As for cervical or prostate cancers	

CANCERS (CERVICAL CANCER)
Background
Cervical cancer is abnormal cell growth in the cervix. The main cause is a virus called the Human Papilloma Virus (HPV). HPV is usually sexually transmitted. Infection can also spread through skin-to-skin genital contact without penetrative sex Cancer of the cervix is the second most common cancer among women worldwide. It is the leading cause of cancer deaths in developing countries. In 2008, it is estimated that 529,409 new cases occurredwith 274,883 of the women (52% of cases) dying. Of the total new cases each year, about 86% occur indeveloping countries, where 80-90% of deaths occur. According to the Nairobi Cancer Registry 2003-2006, cervical cancer is the second most common cancerafter breast cancer at 19.3% and 20% respectively of all reported cancers in Kenya. However cervical cancer is the most common cause of cancer related deaths in Kenya. The incidence of cervical cancer inKenya is estimated to be 2,454 women per year with annual number of deaths estimated at 1,676 women. Cancer of the cervix is easily detectable and curable in its early stages. ***Cervical cancer is recognized as an AIDS-defining illness in HIV infection.***
Surveillance goal
▪ Early detection and intervention for the most at-risk population ▪ Estimate the magnitude of the disease ▪ Monitor prevention and control program activities
Standard case definitions
Suspected case: Any woman aged 15 and above presenting with abnormal vaginal bleeding after sexualintercourse and pain during sexual intercourse with or without smelly vaginal discharge/pelvic pain/and or mass ***Probable case*:** Suspected case confirmed by Visual Inspection with Acetic Acid (VIA) or Visual Inspection with Lugol's Iodine (VILI) or Cytology using Conventional Pap smear ***Confirmed case:*** Suspected case confirmed by histological methods
Respond to alert threshold
▪ Promote early detection through screening campaigns ▪ Advocate for HPV vaccine for females aged 9–13 years. ▪ Promote interventions to address other risk factors ▪ Increase awareness through IEC.
Respond to action threshold
▪ Ensure treatment is carried out according to the guidelines
Analyze and interpret data

CANCERS (CERVICAL CANCER)

Time: Graph cases monthly to analyze trends

Place: Compare sub-county trends with national and regional trends

Person: Analyze the distribution of cases by age and other demographic factors.

Screening:

1. Visual inspection with acetic acid (VIA): Involves non-magnified visualization of uterine cervix soaked with 3–5% acetic acid. Carcinoma in situ will show a well-defined, acetowhite areas in the transformation zone, close to or abutting the squamocolumnar junction. Women with a positive VIA are referred for more investigations
2. PAP smear (Papanicolaou smear): Start 3 years after first sexual intercourse, then yearly – once everythree years
3. Colposcopy permits the identification of mucosal abnormalities characteristic of CIN or invasivecancer.

Laboratory confirmation

Diagnostic test	Histology of biopsy or following hysterectomy
Specimen	Biopsy (punch biopsy, cone biopsy, endo-cervical curettage)
When to collect	Biopsy is best taken around mid-cycle in suspected cases.
How to prepare, store, and transport	▪ Ideally, specimen should be transported fresh (in a plastic bag or container onice) to the laboratory ▪ However, when immediate transport is not practical, immediately place specimen in formalin (at least twice the specimen volume). The container should be large enough to ensure that no distortion of the specimen occurs. ▪ As a guide, a specimen left at room temperature for 30 minutes may commence autolysis and compromise hormone receptors results as well as pathology assessment.
Results	These will be provided by the pathologist. Together with clinical examination andsurgical procedures, these will be used to stage the cervical cancer.

Reference

- National Guidelines for Prevention and Management of Cervical, Breast and Prostate Cancers , **MINISTRY OF PUBLIC HEALTH AND SANITATION, Division of reproductive health, 2011**
- World Health Organization (2008). *Cancer Control: Knowledge to Action: WHO Guide to EffectivePrograms. Policy and Advocacy* [Online] Available from: http://www.who.int/cancer/FINAL-Advocacy-Module%206.pdf (Accessed on: 10 March 2011)
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- Ministry of Health. *National Reproductive Health Policy 2007*. Government of Kenya, 2007
- Kenya Cancer Registry.Kenya Medical Research Institute.2010

CANCERS (OESOPHAGEAL CANCER)

Background

Cancer of the oesophagus develops as a result of cell changes in the lining of the oesophagus.

There are two main types of cancer of the oesophagus: squamous carcinoma, which is more common atthe upper end of the gullet, and adenocarcinoma, which is more common at the lower end, particularly around the junction between the gullet and the stomach.

According to the Kenya cancer registry, carcinoma of the esophagus is the fifth most common cancer inKenya.

Risk factors include:

- Age. Most patients are over 60,
- Sex. It is more common in men.
- Heredity. It is more likely in people who have close relatives with cancer.
- Tobacco smoking and heavy alcohol use increase the risk, and together appear to increase the risk more than either individually. Tobacco and/or alcohol account for approximately 90% of all esophageal squamous cell carcinomas. Tobacco smoking is also linked to esophageal adenocarcinomathough no scientific evidence has been found between alcohol and esophageal adenocarcinoma.
- Gastroesophageal reflux disease (GERD) and its resultant Barrett's esophagus increase esophageal cancer risk due to the chronic irritation of the mucosal lining. Adenocarcinoma is more common in this condition.[6]
- Human papillomavirus (HPV)
- Corrosive injury to esophagus by swallowing strong alkalines (lye) or acids.
- Particular dietary substances, such as nitrosamine.
- A medical history of other head and neck cancers increases the chance of developing a second cancerin the head and neck area, including esophageal cancer.
- Radiation therapy for other conditions in the mediastinum.
- Obesity increases the risk of adenocarcinoma four-fold. It is suspected that increased risk of refluxmay be behind this association.
- Thermal injury as a result of drinking hot beverage
- Alcohol consumption in individuals predisposed to alcohol flush reaction

Surveillance goal

- Early detection and intervention for the most at-risk population
- Estimate the magnitude of the disease
- Monitor prevention and control program activities

Standard case definitions

Suspected case: Any person presenting with gradual difficulty in swallowing with or without pain, weightloss, excessive salivation, vomiting or regurgitation of feeds

Confirmed case: Suspected case confirmed by histological methods

Respond to alert threshold

- Support interventions to address risk factors
- Facilitate advocacy through IEC to the at-risk population
- Advice on need to undergo endoscopy with biopsy for histology for suspected cases

Respond to action threshold

- Ensure treatment is carried according to the guidelines

Analyze and interpret data

CANCERS (OESOPHAGEAL CANCER)

Time: Graph cases monthly to analyze trends

Place: Compare sub-county trends with national and regional trends

Person: Analyze the distribution of cases by age and other demographic factors.

Screening

The following testes/procedures may be used in screening and in staging the cancer:

- Barium swallow and follow-through
- Endoscopy: OesophaGealgastroDuodinoscopy(OGD)
- Endoscopic ultrasound is the most sensitive test to help determine the depth of penetration of the tumour

Laboratory confirmation

Diagnostic test	Histology
Specimen	▪ Excision biopsy at surgery ▪ Tissue biopsy at endoscopy
When to collect specimen	▪ In all suspected cases ▪ As a screening procedure when indicated, e.g., when there is a strong familyhistory of oesophageal or stomach cancer.
How to prepare, store, and transport	▪ Ideally, specimen should be transported fresh (in a plastic bag or container on ice) to the laboratory ▪ However, when immediate transport is not practical, immediately place specimen in formalin (at least twice the specimen volume). The container should be large enough to ensure that no distortion of the specimen occurs. ▪ As a guide, a specimen left at room temperature for 30 minutes may commence autolysis and compromise hormone receptors results as well as pathology assessment.
Results	These will be provided by the pathologist. Together with clinical examinationand surgical procedures, these will be used to stage the oesophageal cancer.

Reference

- World Health Organization (2008). *Cancer Control: Knowledge to Action: WHO Guide to EffectivePrograms. Policy and Advocacy* [Online] Available from: http://www.who.int/cancer/FINAL-Advocacy-Module%206.pdf (Accessed on: 10 March 2011)
- World Health Organization (2007). *The World Health Organization's Fight against Cancer. Strategies that Prevent, Cure and Care*. [Online] Available from: http://www.who.int/cancer/publicat/WHOCancerBrochure2007.FINALweb.pdf (Accessed on: 10 March 2011).
- Ministry of Public Health and Ministry of Medical Services. *National Cancer Control Strategy 2011-2016.E*Government of Kenya.
- Eosophageal cancer;Wikipedia the free ecyclopedia; *http://en.wikipedia.org/wiki/Esophageal_cancer*

CANCERS (PROSTATE CANCER)

Background

- Prostate cancer occurs when cells of the prostate gland multiply abnormally and in an uncontrolled manner.
- Prostate cancer is the most common cancer in men in Africa and the third cause of cancer deaths in men after age 55 worldwide.
- According to the Nairobi cancer registry report, prostate cancer represented 73% of all cancers of the reproductive system in males between 2000 and 2002. Although these figures are low, they were reported by just a few hospitals in Nairobi, and the indication is that prostate cancer is much more common than these figures indicate.
- Risk factors include: Age, Race, Diet, High Testosterone levels, Infections e.g., Chronic prostatitis and frequent sexually transmitted illnesses, Family history
- Initially, the disease is localized but later spreads locally, through the lymphatics and via the bloodstream to organs such as the pelvic bone, lumbar vertebrae, rectum and other distant tissues such as the lungs and liver.
- Prevention: Measures to prevent prostate cancer include creating and increasing awareness of prostate cancer among the general population, educating them on the risk factors and encouraging them to improve their diet with reference to micronutrients and vitamins.
- Locally available foodstuffs that contain micronutrients that protect against prostate cancer include green leafy vegetables, tomatoes, pumpkins and water melons, particularly the seeds. Clients shouldbe encouraged to eat them routinely. In addition, there are screening methods that can detect earlycases when they are still curable.

Surveillance goal

- Early detection and intervention for the most at-risk population
- Estimate the magnitude of the disease
- Monitor prevention and control program activities

Standard case definitions

Suspected case: Any male aged 40 and above presenting with any of the following; decrease in the force of urine stream, intermittency, frequency, urgency, dysuria, pain on ejaculation, haematuria, dribbling ofurine, difficulty in achieving an erection and finally distended bladder with urinary retention

Confirmed case: Suspected case confirmed by histopathological methods

Respond to alert threshold

- Promote early detection by supporting interventions to address risk factors
- Facilitate advocacy through IEC to the at-risk population
- Advice on need to seek care for screening and diagnosis

Respond to action threshold

- Ensure treatment is carried out according to the guidelines

Analyze and interpret data

Time: Graph cases monthly to analyze trends

Place: Compare sub-county trends with national and regional trends

Person: Analyze the distribution of cases by age and other demographic factors

Screening Methods

- Digital Rectal Examination (DRE)
- Prostate Specific Antigen (PSA): Both diagnostic and to get baseline to follow up during treatment. PSA is a very sensitive tumour marker and can be used in early detection of the disease. Normal levels for age are:
  - 0-49yrs below 2.5 ng/L

- 50-59yrs below 3.5 ng/L
- 60-69yrs below 4.5ng/L
- >70yrs below 6.5

- Trans-rectal Ultra-sonography (TRUS)

Laboratory confirmation	
Diagnostic test	Histology
Specimen	▪ Biopsy: Trans-urethral or trans-rectal ▪ Excisional biopsy of prostate during prostatectomy
When to collect	Any suspected case in which screening findings are suggestive of prostatic cancer
How to prepare, store, and transport	▪ Ideally, specimen should be transported fresh (in a plastic bag or container on ice) to the laboratory ▪ However, when immediate transport is not practical, immediately place specimen in formalin (at least twice the specimen volume). The container should be large enough to ensure that no distortion of the specimen occurs. ▪ As a guide, a specimen left at room temperature for 30 minutes may commence autolysis and compromise hormone receptors results as well as pathology assessment.
Results	These will be provided by the pathologist. Together with clinical examinationand surgical procedures, these will be used to stage the prostatic cancer.

Reference

- National Guidelines for Prevention and Management of Cervical, Breast and Prostate Cancers, **MINISTRY OF PUBLIC HEALTH AND SANITATION, Division of reproductive health, 2011**
- World Health Organization (2008). *Cancer Control: Knowledge to Action: WHO Guide to EffectivePrograms. Policy and Advocacy* [Online] Available from: http://www.who.int/cancer/FINAL- Advocacy-Module%206.pdf (Accessed on: 10 March 2011)
- World Health Organization (2007). *The World Health Organization's Fight against Cancer. Strategies that Prevent, Cure and Care*. [Online] Available from: http://www.who.int/cancer/publicat/WHOCancerBrochure2007.FINALweb.pdf (Accessed on: 10 March 2011).
- Ministry of Public Health and Ministry of Medical Services. *National Cancer Control Strategy 2010-2015* (Draft). Government of Kenya.
- Ministry of Health. *National Reproductive Health Policy 2007*. Government of Kenya, 2007

CHIKUNGUNYA

Introduction

- Chikungunya fever is a viral illness that is spread by the bite of infected mosquitoes. The diseaseresembles dengue fever, and is characterized by severe, sometimes persistent, joint pain (arthritis), as well as fever and rash. It is rarely life-threatening. Nevertheless, widespread occurrence of diseases causes substantial morbidity and economic loss
- The word "Chikungunya" is Makonde for "that which bends up," in reference to the stooped posture of patients afflicted with the severe joint pain associated with the disease. Epidemics offever, rash and arthritis, resembling Chikungunya fever were recorded as early as 1779. However, the virus was first isolated between 1952-1953 from both man and mosquitoes duringan epidemic, in Tanzania.
- Chikungunya fever historically displayed interesting epidemiological profiles; major epidemics appeared and disappeared cyclically, usually with an inter-epidemic period of 7-8 years and sometimes as long as 20 years. After a long period of absence, outbreaks appeared in Indonesiain 1999 and have been virtually ongoing since 2004.

Surveillance goal

- Detect Chikungunya sporadic cases and outbreaks promptly, and seek laboratory verification
- Identify high risk areas in order to improve prevention of outbreaks by taking steps to avoidmosquito bites and elimination of breeding sites.

Standard case definition

Suspected case: Any person with acute onset of fever >38.5°C and severe arthralgia/arthritis notexplained by other medical conditions.

Confirmed case: A suspected case with laboratory confirmation

Respond to alert threshold

If Chikungunya cases are suspected:

- Report case-based information immediately to the next level.
- Collect specimens for confirming the cases
- Conduct an investigation to determine the risk factors for transmission
- Manage and treat the cases using anti-inflammatory agents

Respond to action threshold

If chikungunya cases are confirmed

- Symptomatic treatment for mitigating pain and fever using anti-inflammatory drugs along with rest usually suffices. Persistent joint pain may require analgesic and long-term anti-inflammatorytherapy.
- Prevention is entirely dependent upon taking steps to avoid mosquito bites and elimination of mosquito breeding sites.

To avoid mosquito bites:

- Wear full sleeve clothes and long dresses to cover the limbs.
- Use mosquito coils and repellents.
- Use mosquito nets – to protect babies, old people and others, who may rest during the day. Theeffectiveness of such nets can be improved by treating them with permethrin (pyrethroidinsecticide). Curtains (cloth or bamboo) can also be treated with insecticide and hung at windows or doorways, to repel or kill mosquitoes.
- Mosquitoes become infected when they bite people who are sick with Chikungunya. Mosquito

nets and mosquito coils will help prevent mosquitoes from biting sick people

Analyze and interpret data

Time: Graph cases and deaths weekly. Construct an epidemic curve during outbreaks.**Place:**

Plot location of case households with precise mapping.

Person: Report immediate case-based information for cases and deaths. Report summary totals monthly. During outbreak, count cases and deaths weekly. Analyze by age. Assess risk factors to improve prevention of outbreaks.

Laboratory confirmation

Diagnostic test	Serological tests show a rise in antibody titer to Chikungunya virus; the virus may be isolated from the blood of acutely ill patients in newborn mice, mosquitoes or cell culture or detected using IFA or Reverse Transcription Polymerase Chain Reaction (RT-PCR)
Specimen	Serum
When to collect the specimen	Collect specimen from the first suspected case (s). Suspected CHIK cases occur in clusters. Collect representative specimens from suspected cases. If outbreak is confirmed, collect more specimens from cases and also mosquitoes from the affected homes fortesting. Type of Specimen ▪ Acute-phase blood (0-10 days after onset) ▪ Convalescent-phase blood (7 - 21 days after onset)Time of collection: ▪ When patient presents ▪ Collect second sample during convalescence. Between days 7 and 21 afteronset.
How to prepare, store, and transport the specimen	Transport of specimens should comply with the WHO guidelines for the safetransport of infectious substances and diagnostic specimens (WHO, 1997). For ELISA: Refrigerate at 2º to 8º C serum or clot for testing within 24 hour. If keptfor longer store at -80º. For Isolation and RT_PCR: Store at -80º or transport in fully charged dry shipper. Mosquitoes for testing should be transported in fully charged dry shipper. Focus onAedes species
Results	Diagnostic services for Chikungunya are not routinely available. Contact theappropriate National authority or WHO. ▪ Ministry of Health, Division of Disease Surveillance and Response should beable to advice Preliminary results are ready within 24 hours after samples arrive in the laboratory. Confirmatory results are ready within a week from sample reception.

Reference

- Weekly Epidemiological Record N° 1, 2005, 80, 1-8; http//www.who.int/wer World Health Organization http://www.who.int/mediacentre/factsheets/fs327/en/
- United States, Centers for Disease Control http://www.cdc.gov/ncidod/dvbid/chikungunya/

CHIKUNGUNYA

- Sergon et al Seroprevalence of Chikungunya Virus (CHIKV) Infection on Lamu Island, Kenya, October 2004. Am J Trop Med Hyg. 2008 Feb;78(2):333-337
- Powers et al. Evolutionary relationships and systematics of the alphaviruses. J Virol. 2001 Nov;75(21):10118-31

CHOLERA

Background

- Acute illness with profuse watery diarrhoea caused by *Vibrio cholerae* serogroups O1 or O139.The disease is transmitted mainly through the faecal-oral route; that is through eating or drinkingcontaminated food or water.
- Cholera causes over 100 000 deaths per year. It may produce rapidly progressive epidemics or worldwide pandemics. In endemic areas, sporadic cases (less than 5% of all non-outbreak- related diarrhoea cases) and small outbreaks may occur.
- Incubation period is from a few hours to 5 days, usually in the range of from 2 to 3 days.
- There has been a resurgence of cholera in Africa since the mid-1980s, where over 80% of the world's cases occurred in 1999. The majority of cases occurred from January through April.
- Cholera may cause severe dehydration in only a few hours. In untreated patients with severe dehydration, the case fatality rate (CFR) may exceed 50%. If patients present at the health facility and correct treatment is received, the CFR is usually less than 1%. At least 90% of the cases are mild, and they remain undiagnosed.
- Risk factors: eating or drinking contaminated foods such as uncooked seafood or shellfish fromestuarine waters, lack of continuous access to safe water and food supplies, poor sanitary conditions, attending large gatherings of people including ceremonies such as weddings or funerals, contact with persons who died of cholera.

- Other enteric diarrhoea may cause watery diarrhoea, especially in children less than 5 years of age.Please see *Diarrhoea with dehydration* summary guidelines.

Surveillance goal

- Detect and respond promptly and appropriately to cases and outbreaks of watery diarrhoea. Toconfirm an outbreak, collect and transport stool specimens transported in Cary-Blair medium.
- Do immediate case based reporting of cases and deaths when an outbreak is suspected.
- Maintain a linelist for cases and deaths

Standard case definition

Suspected case: If there is no cholera epidemic any person aged 5years or more with acute watery diarrhoea, with or without vomiting **or**

If there is a cholera epidemic, a suspected case is any person age 2 years or more with acute waterydiarrhoea, with or without vomiting.

Confirmed Case: A suspected case in which vibrio cholera O1 or O139 has been isolated in the stool

Respond to alert threshold

If a single case is suspected:

- Report case based information immediately to the next level.
- Manage and treat the case according to national guidelines.
- Enhance strict hand-washing and isolation procedures.

- Perform contact tracing
- Conduct case based investigation to identify similar cases not previously reported.

- Obtain stool specimen from 5 patients within 5 days of onset of acute watery diarrhoea, and beforeantibiotic treatment is started. See laboratory guidelines for information on how to prepare, store and transport the specimens.

Respond to action threshold

If a suspected case is confirmed:

- Establish treatment centre in locality where cases occur. Treat cases on site rather than askingpatients to go to static treatment centres elsewhere.
- Strengthen case management including treatment.
- Mobilize community early to enable rapid case detection and treatment. Survey the availability of clean drinking water.
- Work with community leaders to limit the number of attendance in funerals or other large gatherings for ceremonies or other reasons, especially during an epidemic.
- Reduce sporadic and outbreak-related cases through continuous access to safe water. Promote safepreparation of food (especially seafood, fruits, and vegetables). Promote safe disposal of human waste.

Analyze and interpret data

Time: Graph daily/weekly cases and deaths and construct an epidemic curve during outbreaks. **Place:** Plot the location of case households.

Person: Count daily/weekly total cases and deaths for sporadic cases and during outbreaks. Analyze distribution of cases by age and according to sources of drinking water. Assess risk factors to improve control of sporadic cases and outbreaks.

Laboratory confirmation

Diagnostic test	**Simple initial procedures:** Laboratories lacking capacity to carry out confirmatory tests are encouraged to conduct the following simple tests that may point to cholera: ▪ Motility testing: spin about 2 mls of liquid stool, put one drop on a drop of saline and one drop on peptone water. Observe for motility, Vibrio remain motile on peptone water and non-motile on saline water. ▪ On the same smears gram stain for demonstration of Gram negative curved rods **Confirmatory testing:** ▪ Isolate *V. cholerae species* from stool culture and determine serotype usingpolyvalent antisera for *V. cholerae*. ▪ If desired, confirm identification with Inaba and Ogawa antisera. If specimen is not serotypable, consider, *V. cholerae* O139 (see note in results column).
Specimen	Liquid stool/ rectal swab
When to collect the specimen	For each new area affected by the outbreak, a laboratory confirmation should be done. Collect stool sample from the first suspected cholera case. If more than one suspected cases, collect until specimens have been collected from 5 to 10 cases. Collect stool from patients fitting the case definition and: ▪ Onset within last 5 days, and

	▪ Before antibiotics treatment has started *Do not delay treatment of dehydrated patients.* Specimens may be collected after rehydration (ORS or IV therapy) has begun. If possible, specimens should be collected from 5 – 10 suspected cases every 1 – 2 weeks to monitor cessation of the outbreak, changes in serotypes, and antibiotic sensitivity patterns of V.*cholerae.*
How to prepare, store, and transport the specimen	▪ Place specimen (stool or rectal swab) in a clean, leak proof container and transportto lab within 2 hours. ▪ If more than 2- hour delay is expected, place stool-soaked swab into Cary-Blairtransport medium. ▪ If Cary-Blair transport medium is not available and specimen will not reach the labwithin 2 hours: • Store at 4°C to 8°C • Do not allow specimen to dry. Add small amount of 0.85% NaCl ifnecessary • To transport, transport in well- marked, leak proof container • Transport container in cold box at 4ºC to 8ºC
Results	▪ Cholera tests **should** be routinely performed in all laboratories at sub-county level. ▪ Culture results usually take 2 to 4 days ▪ Cary-Blair transport medium is stable and usually good for at least one year after preparation. It does not require refrigeration if kept sterile and in properly sealed container. If colour changes (medium turns yellow) or shrinks (depressed meniscus), do not use the medium. ▪ The O139 serotype has not been reported in Africa and only in a few places in southwest Asia. ▪ Serological determination of Ogawa or Inaba is not clinically required. It is also not required if polyvalent antisera results are clearly positive.

Reference

- *Management of the patient with cholera*, World Health Organization, 1992. WHO/CDD/SER/91.15 Rev1 (1992)
- *Epidemic diarrheal disease preparedness and response--Training and practice.* Facilitator and participant manuals. World Health Organization, 1997. WHO/EMC/DIS/97.3 and WHO/EMC/DIS/97.4
- "Laboratory Methods for the Diagnosis of Epidemic Dysentery and Cholera." CDC/WHO, 1999 CDC, Atlanta, GA, USA

DENGUE FEVER

Including Dengue hemorrhagic fever (DHF) and Dengue shock syndrome (DSS)

Background

- Dengue fever is an arbovirus transmitted by aedes mosquitoes (both Ae. Aegypti and Ae. Albopiticus). Dengue is caused by four serologically distinct, but closely related viruses: dengue virus(DENV) 1, 2, 3, and 4 of the Flaviviridae family.
- Dengue fever is an emerging pandemic that has spread globally during the past 30 years as a resultof changes in human ecology. Dengue is found in tropical and sub-tropical regions around the world, predominately in urban and semi-urban areas. During dengue epidemics, infection rates among those who have not been previously exposed to the virus are often 40% to 50%, but can reach 80% to 90%.
- Dengue fever is a severe, influenza-like illness that affects infants, young children and adults, but seldom causes death. Dengue hemorrhagic fever (DHF) is a potentially deadly complication that has become a leading cause of hospitalization and death among children in Asia. There is good evidence that sequential infection with the different serotypes of dengue virus increases the risk of more severe disease that can result in shock syndrome (DSS) and death.
- Epidemic dengue activity in Africa has mostly been classical dengue fever caused by DENV-1 and DENV-2 without associated mortality. The first major outbreak of DENV-3 in Africa was documented in Mozambique in 1984-1985. During this outbreak, most patients experienced secondary infections and 2 deaths were attributed to DHF and shock. In 2008, yellow fever and DENV-3 were found to be co-circulating in Abidjan, Cote d'Ivoire, however, no severe dengue casesor deaths attributable to dengue were identified.
- There is no specific treatment for dengue, but appropriate medical care frequently saves the lives ofpatients with dengue hemorrhagic fever.
- Infected humans are the main carriers and multipliers of the virus, serving a source of the virus foruninfected *Aedes aegypti* mosquitoes which maintain the urban dengue transmission cycle. The virus circulates in the blood of infected human for 2-7 days, at approximately the same time that they have a fever. A sylvatic transmission cycle has been documented in west Africa where DENV-2 hasbeen found in monkeys. There is no evidence of person-to-person transmission.
- At present, the only method of controlling or preventing dengue virus transmission is to combat thevector mosquitoes using environmental management and chemical methods.

Surveillance goal

Surveillance for suspected cases and investigation of clusters of suspected cases in areas with *Ae. Aegypti* and *Ae. Albopiticus* mosquitoes

Standard case definition

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

Dengue Fever Confirmed case: A suspected case with laboratory confirmation (positive IgM antibody,rise in IgG antibody titres, positive PCR or viral isolation).

Dengue Hemorrhagic 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; hematemesis or melaena; andthrombocytopenia (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,

DENGUE FEVER

Including Dengue hemorrhagic fever (DHF) and Dengue shock syndrome (DSS)

signs of plasma leakage (pleural effusion, ascites, hypo-proteinaemia).

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

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the next level.
- Conduct active search for additional cases
- Collect specimens for confirming the cases

Respond to action threshold

If a single case is confirmed:

- Report case-based information immediately to the next level.
- Conduct active search for additional cases
- Collect specimens for confirming the cases
- Survey the community to determine the abundance of vector mosquitoes, identify the most productive larval habitats, promote and implement plans for their elimination, management or treatment with appropriate larvicides.
- Educate the public and promote behaviors to remove, destroy or manage mosquito vector larvalhabitats.
- Manage and provide supportive treatment to dengue fever cases. Implement standard infectioncontrol precautions. Prevent access of mosquitoes to patients by using mosquito bednets.
- Refer suspected DHF/DSS cases to more advanced facilities.

Analyze and interpret data

Time: Graph cases and deaths weekly/monthly. Construct an epidemic curve during the outbreak. **Place:** Plot location of case households and work sites using precise mapping.

Person: Case-fatality rate. Analyze age and sex distribution. Percentage of DHF / DSS cases and of hospitalizations.

Laboratory confirmation

Diagnostic test	▪ Demonstration of IgM and IgG by Antibody Assays. ▪ Detection of viral genomic sequences by PCR. ▪ Isolation of the dengue virus using cell culture. ▪ Antigen detection Assays for acute phase samples when PCR or isolation isnegative. ▪ Demonstration of dengue virus antigen in autopsy tissue by immunohistochemistry or immunofluorescence or in serum samples by EIA. *Note: there are several diagnostic techniques available to document an infection bythe dengue virus. The IgM ELISA is the basic test for serologic diagnosis.*
Specimen	▪ ELISA: Whole blood, serum or plasma from acute (0-5 days) andconvalescent 6 or more days) depending on each case. ▪ PCR: Whole blood or blood clot, serum/ plasma or tissue preferably fromacute specimens (0-5 days)

DENGUE FEVER

Including Dengue hemorrhagic fever (DHF) and Dengue shock syndrome (DSS)

	The samples should be collected for diagnosing a suspected dengue fatality: A blood sample to attempt PCR, virus isolation and serology. If an autopsy isperformed, blood from the heart should be collected.
When to collect the specimen	Collect specimen from the first suspected case. If more than one suspected case, collect until specimens have been collected from 5 to10 suspected cases. Type of Specimen ▪ Acute-phase blood (0-5 days after onset of symptoms) ▪ Convalescent-phase blood (≥ 6 days after onset) Time of collection: Collect 2nd sample during convalescence. Between days 6 and 21after onset. Lab diagnosis of fatal cases is indispensable for understanding the risk factors forsevere cases.
How to prepare, store, and transport the specimen	Transport of specimens should comply with the WHO guidelines for the safetransport of infectious substances and diagnostic specimens. For ELISA or PCR: ▪ Refrigerate serum or clot. For long term storage freeze -20C ▪ Freeze (-20C or colder) tissue specimens for virus isolation If an autopsy has been performed and no fresh tissues are available, tissues fixed informalin should be submitted for immunohistochemical studies.
Results	**Diagnostic services for Dengue fever and Dengue hemorrhagic fever are not routinely available.** Advance arrangements are usually required for VHF diagnostic services. Contact the appropriate National authority or WHO.

Reference

- WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2
- Dengue: clinical and Public Health Aspects/CDC

DIABETES

Background

- Diabetes mellitus (DM) is a widespread chronic disease that occurs when the pancreas does not produce enough insulin, or when the body cannot effectively use the insulin it produces. Diabetes can cause serious health complications including heart disease, blindness, kidney failure, and lower-extremity amputations.
- The most common form is Type 2 diabetes that represents more than 85% of the cases. Other formsare less common such as Type 1 (10% of cases), specific diabetes and gestational diabetes (5% ofcases).
- The risk factors that affect the onset of diabetes are well-known. They comprise non-modifiable factors like old age (over 45 years of age), family history, and the causes of diabetes in pregnancy.Modifiable risk factors for diabetes are obesity, physical inactivity and excessive alcohol consumption.
- The global prevalence in 2000 was estimated at 2.8%, with projections of 4.8% by 2030. The total

DIABETES

number of persons affected will rise from 171 million in 2000 to 366 million in 2030 if no action is taken. Annual mortality linked to diabetes worldwide is estimated at more than one million.

- Diabetes is no longer considered rare in Africa. Recent estimates based on the WHO STEP-wise approach for monitoring the risk factors of non-communicable diseases indicate prevalence of between 1% and 20%. In some countries such as Mauritius, it reaches 20%.
- The rate of limb amputations due to diabetes varies from 1.4% to 6.7% of diabetic foot cases. In some African countries, the mortality rate is higher than 40 per 10,000 inhabitants.
- In the African Region, efforts made to create an environment that enhances the fight against diabetesinclude adoption of resolutions on non-communicable diseases in 2000, cardiovascular diseases strategy in 2005, and diabetes mellitus strategy in 2007. The World Health Organization and the International Diabetes Federation (IDF) have also jointly carried out actions to contribute to promoting diabetes awareness in Africa.

Surveillance goal

- Estimate the magnitude of the disease
- Monitor trends and risk factors
- Identify populations at highest risk (e.g.; age groups, urban vs. rural)
- Monitor prevention and control program activities

Standard case definition

Suspected new case: Any person presenting with the following symptoms:

- Increased thirst
- Increased hunger
- Frequent urination

Confirmed new case: Any person with:

- A non-fasting venous blood or plasma glucose measurement of ≥ 11.1mmol/L (200 mg/dl)

OR

- A fasting venous blood or plasma glucose measurement of ≥ 7 mmol/L (126 mg/dl) or capillaryglucose ≥ 6.1 mmol/L (110 mg/dl)
- Any person with a non-fasting venous plasma glucose measurement of ≥ 11.1mmol/L (200 mg/dl) or capillary glucose ≥ 11,1 mmol/L (200 mg/dl)

**Report only the first lab-confirmed diagnosis of the patient*

Recommended public health action

For people with diabetes: Treat confirmed cases according to the standardized case management guidelines (WHOPEN).

Sub-county-level Prevention:

- Implement an integrated prevention and control programme for non-communicable diseases focusing on diabetes through community awareness and education activities conducted in accordance with national prevention and control programmes for non-communicable diseases. These activities would include multisectoral strategies and plans of action on diet, weight- reduction, and physical activity.
- Implement clinical preventive measures and treatment interventions using evidence-based guidelines (screening high risk patients, for example).

Analyze and interpret data

DIABETES

Time: Graph cases quarterly to analyze trends.

Place: Compare sub-county trends with national and regional trends.

Person: Analyze the distribution of cases by age and other demographic factors.

****Data for non-communicable diseases is analyzed for long term trends***

Laboratory confirmation	
Diagnostic test	Measuring glucose in capillary blood using a reagent strip test and referencemeter Measuring glucose in plasma using a glucose-oxidase colorimetric test methodLab case definition (see section 8.0)
Specimen	Plasma, Capillary blood, Venous whole blood
When to collect	Blood glucose measurements must be carried out on the day and at the timerequested. Fasting specimen: for adult the fasting period is usually 10 to 16 hours. For children the fasting period is 6 hours. Post-prandial specimen: 2hr post-prandial specimen.
How to prepare, store, and transport	Specimen should be examined immediately or preserved in florinated bottle athealth facility where the specimen is taken.
Results	Results are ready within few hours.

Reference

- Non communicable Diseases: A strategy for the African Region, AFR/RC50/10
- Cardiovascular Diseases in the African Region: Current situation and perspectives, AFR/RC55/12
- Diabetes prevention and control: a strategy for the African Region, AFR/RC57/7
- Steps manual: http://www.who.int/chp/steps/en/
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- IDF, *Diabetes Atlas*, 2nd Edition, Brussels, International Diabetes Federation, 2003.
- WHO, *Preventing chronic diseases: A vital investment*, Geneva, World Health Organization, 2005.
- WHO, The burden of mortality attributable to diabetes, Geneva, World Health Organization, 2004.
- WHO-PEN: Protocols for health promotion, prevention and management of NCDs at primary care level http://www.afro.who.int/en/divisions-a-programmes/ddc/division/2257-who-pen- protocols.html
- Sub-county Laboratory Practice in Tropical countries, Cambridge

DIARRHEA WITH BLOOD (SHIGELLA)

Background

- *Shigella dysenteriae* type 1 (SD1*)* is the most common cause of enteric infections and is transmitted from person-to-person through faecal-oral route.
- Large scale outbreaks may be caused by *Shigella dysenteriae* type 1 (SD1) with up to 30% ofpopulations infected. The case fatality rate may approach 20% among young children and elderly persons with severe dehydration.
- The incubation period is 1 to 4 days.
- Clinical illness is characterized by acute fever and bloody diarrhoea, and can also present withsystemic symptoms and signs as well as dehydration especially in young children.
- Risk factor: overcrowded areas with unsafe water and poor sanitation (for example, refugee andfamine populations).
- SD1 is frequently resistant to multiple antibiotics including trimethoprim-sulfamethoxazole.
- Enterohemorrhagic and enteroinvasive *E. coli* and other bacteria or parasites such as *Entamoeba histolytica* may also cause bloody diarrhoea.

Surveillance goal

- Detect and respond to dysentery outbreaks promptly.
- Improve percentage of laboratory-confirmed cases and evaluate proportion verified as type 1(SD1).
- Determine antibiotic sensitivity pattern of the agents isolated (especially SD1) both for routine surveillance and during outbreaks.

Standard case definition

Suspected case: A person with diarrhoea with visible blood in stool.

Confirmed case: Suspected case with stool culture positive for *Shigella dysenteriae* type1.

Respond to alert threshold

- When you see cases increasing or in areas where cases have not been reported.
- Take an average of 1.5 times higher than the baseline (cases you have had in the past 3 weeks)If you observe

that the number suspected case or deaths is increasing over a period of time:

- Report the increase to the next level of the health system.
- Treat the suspected cases with oral rehydration and antibiotics based on recent susceptibilityresults, if available.
- Obtain stool or rectal swab specimen for confirming the SD1 outbreak.
- Investigate the case to determine risk factors contributing to transmission.

Respond to action threshold

If a suspected outbreak is confirmed:

- Search for additional cases in locality of confirmed cases.
- Strengthen case management and treatment.
- Mobilize community to enable rapid case detection and treatment.
- Identify high risk populations using person, place, and time data.
- Reduce sporadic and outbreak-related cases by promoting hand-washing with soap or ash and water after defecating and before handling food. Strengthening access to safe water supply andstorage, and use of latrines and safe disposal of human waste.

Analyze and interpret data

Time: Graph monthly trends in cases and deaths. Construct an epidemic curve for outbreak cases.

DIARRHEA WITH BLOOD (SHIGELLA)

Place: Plot location of case households.

Person: Count cases and deaths each month. During an outbreak, count outbreak-related cases by week. Routinely analyze age distribution. Assess risk factors to improve control and prevention of sporadic diseases and outbreaks.

Laboratory confirmation	
Diagnostic test	Isolate *Shigella dysenteriae* type 1 (SD1) in culture to confirm shigella outbreak.If SD1 is confirmed, perform antibiotic sensitivity tests with appropriate drugs.
Specimen	Stool or rectal swab.
When to collect the specimen	For each new area affected by the outbreak, a laboratory confirmation should bedone. Collect sample when an outbreak is suspected. Collect stool from 5-10 patients whohave bloody diarrhea and: ▪ Onset within last 4 days, and ▪ Before antibiotic treatment has started. Preferably, collect stool in a clean, dry container. Do not contaminate with urine.Sample stool with a swab, selecting portions of the specimen with blood or mucus. If stool cannot be collected, obtain a rectal swab sample with a clean, cotton swab.
How to prepare, store, and transport the specimen	Place stool swab or rectal swab in Cary-Blair transport medium. Transport to laboratory refrigerated. If Cary-Blair not available, send sample to lab within 2 hours in a clean, dry container with a tightly-fitting cap. Specimens not preserved in Cary-Blair will havesignificant reduction of *shigellae* after 24 hours. If storage is required, hold specimens at 4°C to 8°C, and do not freeze.
Results	Culture results are usually available 2 to 4 days after receipt by the laboratory.SD1 isolates should be characterized by antibiotic susceptibility. After confirmation of initial 5-10 cases in an outbreak, sample only a small numberof cases until the outbreak ends, to monitor cessation of the outbreak, and antibiotic sensitivity patterns, which will guide the definitive treatment. Refer to disease specific guidelines in Section 8.0 for additional information about the epidemic potential of *Shigella dysenteriae* 1

Reference

- Guidelines for the control of epidemics due to Shigella dysenteriae type 1. WHO/CDR/95.4
- Safe Water Systems for the Developing World: A Handbook for Implementing Household-basedWater Treatment and Safe Storage Projects. Department of Health & Human Services. Centers for Disease Control and Prevention. Atlanta. 2000
- "Laboratory Methods for the Diagnosis of Epidemic Dysentery and Cholera". CDC/WHO, 1999 CDC, Atlanta, GA, USA

DIARRHEA WITH DEHYDRATION IN CHILDREN LESS THAN 5 YEARS OF AGE

Background

Diarrhoea with dehydration in children less than 5 years of age is due to infections of the gastrointestinaltract caused by viruses (especially *Rotavirus*), bacteria *(E. Coli, Salmonellae, shigellae, Campylobacter, Yersinia*, and others), and parasites (*Giardia*, *Entamoeba*, cryptosporidia, and cyclospora). These diseases are transmitted through eating contaminated food or water, or through faecal-oral route

Diarrheal diseases represent the second leading cause of death among children less than 5 years of age inmany African countries, with more than 3 million deaths per year.

Different epidemiological patterns (for example, seasonality) are observed for different pathogens.

The Ministry of Health advocate that each sub-county team use the Integrated Management of ChildhoodIllnesses (IMCI) strategy to reduce morbidity and mortality of childhood diarrhoea.

Surveillance goal

- Detect diarrhoea outbreaks promptly. Laboratory confirmation can confirm specific pathogenic agent outbreak, but laboratory confirmation is not necessary for routine surveillance of diarrhoeawith dehydration.
- Monitor antimicrobial resistance during outbreaks of bacterial origin.

Standard case definition

Suspected case:: Passage of 3 or more loose or watery stools in the past 24 hours **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; sunkeneyes; not able to drink or drinking poorly; skin pinch goes back very slowly.

Confirmed case:

Suspected case confirmed with stool culture for a known enteric pathogen. *Note:* Laboratoryconfirmation of specific agent causing outbreak is not routinely recommended for surveillance purposes.

Respond to alert threshold

If you observe that the number of cases or deaths is increasing over a period of time:

- Report the problem to the next level.
- Investigate the cause for the increased number of cases or deaths and identify the problem.
- Make sure that cases are managed according to IMCI guidelines.
- Encourage home-based therapy with oral rehydration.

Respond to action threshold

If the number of cases or deaths increase to two times the number usually seen in a similar period in thepast:

- Assess health worker practice of IMCI guidelines for managing cases and improve performancefor classifying diarrhoea with dehydration in children less than 5 years of age.
- Teach mothers about home treatment with oral rehydration.
- Conduct community education about boiling and chlorinating water, and safe water storage andpreparation of foods.

Analyze and interpret data

Time: Graph cases and deaths to compare with same period in previous years. Prepare graphs for outpatient diarrhoea with some dehydration and for diarrhoea with severe dehydration. Construct an

DIARRHEA WITH DEHYDRATION IN CHILDREN LESS THAN 5 YEARS OF AGE

epidemic curve when outbreaks are detected.

Place: Plot location of case households.

Person: Report monthly totals due to diarrhoea with some dehydration and also for diarrhoea with severe dehydration from outpatient services. Also report monthly inpatient total cases and deaths due todiarrhoea with severe dehydration.

Laboratory confirmation

Laboratory culture of stools may be used to confirm possible outbreaks of specific agents, but is notnecessary for case definition.

Reference

Management of childhood illness: Clinical skills training course for first level health facilities. WorldHealth Organization. WHO/CDR/95.14

Integrated Management of Childhood Illness: A WHO/UNICEF Initiative Bulletin of the World Health Organization. Vol. 75, 1997, Supplement 1, 1997. ISBN 92 4 068750 5

EBOLA OR MARBURG VIRAL HEMORRAGHIC FEVERS

Background

- The Ebola and Marburg viruses are both filoviruses.
- Almost 3,000 cases of Ebola with over 1,900 deaths have been documented since the Ebola viruswas discovered in 1976. Major Ebola outbreaks have occurred in Sudan, DRC, Cote d'Ivoire, Gabon, Uganda and Congo.
- More than 500 cases of Marburg with over 400 deaths were reported during outbreaks of Marburg virus that occurred in DRC (1998-2000), Angola (2004-2005) and Uganda (3 cases in 2007).
- These two viruses are transmitted by direct contact with the blood, secretions, organs or other body fluids of infected persons. The infection of humans with Ebola virus through the handling ofinfected chimpanzees, gorillas, and forest antelopes (alive and dead) has been documented.
- Ecological studies are in progress to identify the natural reservoirs of both Marburg and Ebola. There is evidence that bats are involved.
- Epidemics can be dramatically amplified in health care facilities with inadequate infection control precautions/barrier nursing procedures.
- Incubation period for Ebola and Marburg is 2 to 21 days.
- Between 20% and 80% of patients have hemorrhagic manifestations depending on the Ebola or Marburg virus strain. Patients become increasingly infectious as their illness progresses.
- High case fatality ratios have been reported during Ebola outbreaks (25% to 90%) and during Marburg outbreaks (25% to 80%)
- There is no specific treatment for either disease. Severe cases require intensive supportive care, aspatients are frequently dehydrated and in need of intravenous fluids or oral rehydration with solutions containing electrolytes.
- Close contact with a severely ill patient, during care at home or in hospital, and certain burial practices are common routes of infection. Transmission via contaminated injection equipment orthrough needle-stick injuries is associated with more severe disease. Infection may also be spreadthrough contact with soiled clothing or bed linens from an infected patient.

Surveillance goals

EBOLA OR MARBURG VIRAL HEMORRAGHIC FEVERS

- Early detection of cases and outbreaks, rapid investigation, and early laboratory verification of the etiology of all suspected cases.
- Investigation of all suspected cases with contact tracing.
- During epidemics, most infected patients do not show hemorrhagic symptoms and a specificcase definition according to the suspected or confirmed disease should be used.

Standard case definition

Suspected case: Illness with onset of fever and no response to usual causes of fever in the area, and atleast one of the following signs: bloody diarrhoea, bleeding from gums, bleeding into skin (purpura), bleeding into eyes and urine.
Confirmed case: A suspected case with laboratory confirmation (positive IgM antibody, positive PCR orviral isolation), or epidemiologic link to confirmed cases or outbreak.

Note: During an outbreak, these case definitions may be changed to correspond to the local event.

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the appropriate levels.
- Suspected cases should be isolated from other patients and strict barrier nursing techniquesimplemented.
- Standard precautions should be enhanced throughout the healthcare setting.
- Treat and manage the patient with supportive care.
- Collect specimen to confirm the case(s).
- Conduct case-contact follow-up and active case search for additional cases.

Respond to action threshold

If a single case is confirmed:

- Maintain strict VHF infection control practices throughout the outbreak. See **Annex 9K**
- Mobilize the community for early detection and care of cases and conduct community educationabout how the disease is transmitted and how to implement infection control in the home care setting and during funerals.
- Conduct case contact follow-up and active searches for additional cases that may not come to thehealth care setting.
- Request additional help from other levels as needed.
- Establish isolation ward to handle additional cases that may come to the health centre.

Analyze and interpret data

Person: Implement immediate case-based reporting of cases and deaths. Analyze age and sex distribution.Assess risk factors and plan disease control interventions accordingly.
Time: Graph cases and deaths daily/weekly. Construct an epidemic curve during the outbreak.**Place**: Map locations of cases' households.

Laboratory confirmation

Diagnostic test	Presence of IgM antibodies against Ebola, Marburg, CCHF, Lassa or West Nile Fever *or* Presence of Ebola in post-mortem skin necropsy
Specimen	▪ *For ELISA*: Whole blood, serum or plasma ▪ *For PCR*: Whole blood or blood clot, serum/plasma or tissue ▪ *For immunohisto-chemistry:* Skin or tissue specimens from *fatal* cases.
When to collect	Collect specimen from the first suspected case.

EBOLA OR MARBURG VIRAL HEMORRAGHIC FEVERS

	If more than one suspected case, collect until specimens have been collected from 5 to10 suspected cases.
How to prepare, store, and transport	HANDLE AND TRANSPORT SPECIMENS FROM SUSPECTED VHF PATIENTS WITH EXTREME CAUTION. WEAR PROTECTIVE CLOTHING AND USE BARRIER PRECAUTIONS. *For ELISA or PCR:* ▪ Refrigerate serum or clot ▪ Freeze (-20C or colder) tissue specimens for virus isolation *For Immunohistochemistry:* ▪ Fix skin snip specimen in formalin. Specimen can be stored up to 6 weeks. Thespecimen is not infectious once it is in formalin. ▪ Store at room temperature. Formalin-fixed specimens may be transported atroom temperature.
Results	Diagnostic services for VHF are not routinely available. Advance arrangements areusually required for VHF diagnostic services. Contact the appropriate National authority or WHO.

Reference

- Interim Infection Control Recommendations for Care of Patients with Suspected or ConfirmedFilovirus (Ebola, Marburg) Hemorrhagic Fever. BDP/EPR/WHO, Geneva March 2008.
- Infection control for VHF in the African health care setting, WHO, 1998. WHO/EMC
- WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2
- WHO Fact Sheet No 103, Ebola hemorrhagic fever, revised December 2008
- WHO Fact Sheet, Marburg hemorrhagic fever, revised July 2008
- Interim Infection Control Recommendations for Care of Patients with Suspected or ConfirmedFilovirus (Ebola, Marburg) Hemorrhagic Fever. BDP/EPR/WHO, Geneva March 2008.
- WHO recommended Guidelines for Epidemic Preparedness and Response: Ebola HemorrhagicFever (EHF). WO/EMC/DIS/97.7.
- Dengue hemorrhagic fever: diagnosis, treatment, prevention and control. 2nd edition. Geneva:World Health Organization. 1997.

GUINEA WORM DISEASE (DRACUNCULIASIS)

Background

- Dracunculiasis is commonly known as Guinea worm disease. It is caused by a large nematode, adisabling parasite that emerges through the skin of the infected person.
- This is an old disease, known since antiquity, leaving many patients with unfortunate socio- economic consequences. It is transmitted through ingestion of water containing a crustacean (cyclops) which is infested by an immature form (larvae) of the nematode. The Cyclops is foundin stagnant surface water sources (ponds, traditional shallow wells) in rural areas. The female nematode discharges from the host's skin when there is contact with water. The incubation period is between 9 to 12 months. There is no treatment or vaccine against the disease.
- Successful disease control strategies conducted by the endemic countries and an international coalition of partners has pushed Dracunculiasis towards eradication. By December 2008, 4619 cases of Guinea worm were reported to WHO, worldwide, compared to 892 000 that were

GUINEA WORM DISEASE (DRACUNCULIASIS)

reported in 1989, showing a reduction of 99.47%.

- In 1989, the disease was endemic in 20 countries, worldwide: Benin, Burkina Faso, Cameroon, Central African Republic, Côte d'Ivoire, Chad Ghana, Ethiopia, India, Pakistan, Kenya, Mali, Mauritania, Niger, Nigeria, Sudan, Senegal, Togo, Uganda and Yemen
- Currently, solely Africa remains affected where 6 countries are still endemic in 2009: Sudan, Ghana, Mali, Ethiopia, Nigeria, and Niger.

Surveillance goal

- Active detection and investigation of each case at the community level. Monthly reporting ofcases to the next level.
- In zones where local transmission of the Guinea worm disease has been interrupted, maintainactive searches for additional cases or rumors of case.
- Report all imported cases to countries or areas of origin.
- Integrate into surveillance to confirm absence of transmission.

Standard case definition

Suspected case: A person presenting with a skin lesion or lesions (blister or a boil) living in a high riskarea for Guinea Worm Disease or having history of travel to a Guinea Worm Disease endemic area

Confirmed case: A person presenting with a skin lesion or lesions (blister or boil) with emergence of oneor more guinea worms from the blister or boil (each individual should be counted only once in a calendar year)

Respond to alert threshold

If a single case is suspected:

- Report the case according to national program guidelines for eradication of Dracunculiasis.
- Treat the wound (if any) to decrease disability associated with painful leg lesions.
- Conduct case investigation to confirm risk factors.
- Improve access to safe water according to national guidelines.

Analyze and interpret data

Time: Graph cases monthly

Place: Plot distribution of households and work sites for cases from which cases have been reported**Person**: Count monthly cases, and analyze age distribution. Report monthly to next levels

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required. Diagnosis is made by visual recognitionof the adult worm protruding from a skin lesion or by microscopic identification of larvae. Laboratory tests to investigate dracunculiasis are limited because the larvae of *D. medinensis* are normally washedinto water. A diagnosis usually made when the blister has ruptured and the anterior end of the female worm can be seen. If required, laboratory confirmation of the diagnosis can be made as follows: place afew drops of water on the ulcer, collect and transfer the water to a slide and examine microscopically for
motile larvae.

Reference

- *Dracunculiasis or guinea-worm*, Geneva, World Health Organization, WHO/CDS/CEE/DRA/99.2, 1999and WHO/WER N°37 September 2003
- Control of Communicable Diseases Manual, 18th Edition
- Sub-county Laboratory Practice in Tropical countries, Cambridge

HUMAN INFLUENZA CAUSED BY A NEW SUBTYPE

Background

- An influenza pandemic occurs when a new influenza A virus emerges with efficient and sustainedhuman-to-human transmission in populations with limited immunity. Influenza pandemics occurred in 1918, 1957 and 1968. The 1918 pandemic killed an estimated 40–50 million people.It is predicted that a pandemic of equivalent magnitude could kill 62 million people, 96% of them in developing countries.
- Successful containment or control of pandemic influenza is dependent on early recognition of sustained human-to-human transmission. Countries have been encouraged as part of pandemicpreparedness planning to enhance surveillance to (i) detect the emergence of new disease; (ii) characterize the disease (epidemiology, clinically, severity); and (iii) monitor its evolution.
- **Influenza A (H1N1) 2009**: On 11 June 2009, WHO declared a global pandemic due to influenzaA (H1N1) 2009 virus and as of 8 October 2009, 195 countries, territories and areas had reportedcases and/or outbreaks of pandemic (H1N1) virus. The spectrum of disease ranges from non- febrile, mild upper respiratory tract illness to severe or fatal pneumonia.
- **Influenza A (H5N1)**: Another influenza subtype, H5N1 has been circulating among birds for more than 10 years. In 2003, infections in people exposed to sick birds were identified. Since 2003, H5N1 has been confirmed in poultry and/or wild birds in 62 countries and 442 confirmed human H5N1 cases with 262 deaths have been reported from 15 countries. One confirmed death from human infection with AInfluenza (H5N1) was reported from Nigeria in January 2007. Most patients with H5N1 present with symptoms of fever, cough and shortness of breathand radiological evidence of pneumonia. The large majority of cases for which risk factor data are available indicate that direct contact with live or recently dead poultry is the most importantrisk factor for human H5N1 infection. However, the continued geographical spread of this highlypathogenic avian influenza virus among birds in Asia, Europe, the Middle East and Africa has heightened concerns about the possibility of a global human pandemic of influenza H5N1.
- Under the IHR (2005), a State Party is required to notify WHO of the first occurrence of human influenza caused by a new subtype,

Surveillance goals

- To detect and investigate the first evidence of sustained human-to-human transmission of an influenza virus with pandemic potential.
- To assess the earliest cases of pandemic influenza occurring in a country in order to characterizethe new disease including its clinical characteristics, risk factor information, and epidemiologicaland virological features.
- To monitor the course of the pandemic within the country, regionally and globally.

Standard case definition

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

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

- Close contact (within 1 meter) with a person (e.g. caring for, speaking with, or touching) who isa suspected, probable, or confirmed H5N1 case;
- Exposure (e.g. handling, slaughtering, de-feathering, butchering, preparation for consumption) topoultry or wild birds or their remains or to environments contaminated by their faeces in an areawhere H5N1 infections in animals or humans have been suspected or confirmed in the last month;
- Consumption of raw or undercooked poultry products in an area where H5N1 infections in

HUMAN INFLUENZA CAUSED BY A NEW SUBTYPE

animals or humans have been suspected or confirmed in the last month;
- Close contact with a confirmed H5N1 infected animal other than poultry or wild birds;
- Handling samples (animal or human) suspected of containing H5N1 virus in a laboratory orother setting.

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

Respond to alert threshold

Respond to a suspected case of human influenza caused by a new subtype or to an usual event of severeacute respiratory infection:

- Report case-based information immediately to the appropriate levels.
- Implement acute respiratory disease infection control precautions immediately and enhanceStandard Precautions throughout the health care setting.
- Treat and manage the patient according to national guidelines.
- Collect laboratory specimens from case-patient and from symptomatic contacts and arrange forlaboratory testing
- Review clinical and exposure history during 7 days before disease onset.
- Identify and follow-up close contacts of case-patient.
- Search for additional cases.
- Conduct epidemiological investigation to identify risk factors for infection and populations at-riskfor severe disease.

Plan and implement prevention and control measures.

Respond to action threshold

If a single case of human influenza caused by a new subtype is confirmed or if another acute respiratorydisease of epidemic or pandemic potential is confirmed:

- Maintain strict acute respiratory disease infection control precautions and establish an isolationward to manage additional cases who may present for care.
- Treat and manage the patient according to national guidelines.
- Implement active surveillance of case-patient contacts.
- Conduct active searches for additional cases.
- Distribute laboratory specimen collection kits to health care facilities.
- Identify high risk populations.
- Mobilize the community to enable rapid case detection and treatment.

Conduct community education on how influenza is transmitted and on how to implement infectionmeasures in home and community settings.

Analyze and interpret data

Time: Graph weekly cases and deaths, construct an epidemic curve
Place: Plot location of case households and work sites using precise mapping.
Person: Count weekly total cases and deaths for sporadic cases and during outbreaks. Analyze age andsex distribution. Characterize the illness in terms of clinical presentation, the spectrum of disease, the proportion of cases requiring hospitalization, clinical outcomes, case fatality ratio, attack rates by age/occupation.

Laboratory confirmation

Diagnostic test	Identification of human influenza virus infections by: ▪ Detection of influenza-specific RNA by reverse transcriptase-polymerasechain reaction

	▪ Isolation in cell culture (BSL3 lab required for suspected new subtype) ▪ Direct antigen detection (low sensitivity)
Specimen	A variety of specimens are suitable for the diagnosis: ▪ Throat swab ▪ Nasopharyngeal swab ▪ Nasal swab ▪ Nasopharyngeal aspirate ▪ Intubated patients: tracheal swab or broncho lavage fluid ▪ Blood Specimens should be collected in the following order of priority: ▪ Throat swab/Nasopharyngeal swab ▪ Acute serum ▪ Convalescent serum
When to collect the specimen	Obtained specimen within 3 days of the onset of symptoms, Initial specimens (respiratory or blood) should ideally be collected from suspectedpatients before antiviral therapy is begun but treatment must not be delayed in order to take specimens. Optimally, paired sera (3-5 ml of whole blood), collected first during the acute phase of illness and then 14 days or later after the onset of illness, should be tested simultaneously. Specimens should be collected from deceased patients as soon as possible after death
How to prepare, store, and transport the specimen	Respiratory specimens should be transported in virus transport media. Media thatcould be used for a variety of viruses are commercially available. Specimens in viral transport medium for viral isolation should be kept at 4°C and transported to the laboratory promptly. If specimen is transported within 2 days,it may be kept at 4°C; otherwise should be frozen at or below -70 °C until transported to the laboratory. Repeated freezing and thawing must be avoided toprevent loss of infectivity. Sera may be stored at 4°C for approximately one week, but thereafter should befrozen at -20°C. Transport of specimens should comply with the WHO guidelines for the safe transport of infectious substances and diagnostic specimens
Results	Laboratory results should be confirmed by an approved laboratory. Any specimen with a positive result for influenza A virus and suspected of avianinfluenza infection/new subtype should be further tested and verified by a designated WHO CC/ WHO H5 Reference laboratory. Laboratories that lack thecapacity to perform specific influenza A subtype identification procedures are requested to: ▪ Forward specimens or virus isolates to a National Influenza Centre or to aWHO CC/WHO H5 Reference Laboratory for further identification orcharacterisation. ▪ Inform the WHO Office in the country that specimens or virus isolates arebeing forwarded to other laboratories for further identification or further characterization.

HUMAN INFLUENZA CAUSED BY A NEW SUBTYPE

References

- WHO guidelines for global surveillance during an influenza pandemic, April 2009.
- WHO updated interim guidance on global surveillance of human infection with pandemic(H1N1) 2009 virus, July 2009
- WHO guidelines for investigation of human cases of avian influenza A(H5N1), 2007
- WHO interim guidelines on infection prevention and control of epidemic- and pandemic-proneacute respiratory diseases in health care, June 2007.
- Collecting, preserving and shipping specimens for the diagnosis of avian influenza A (H5N1) virusinfection. Guide for field operations, October 2006
- WHO Rapid Advice Guidelines on pharmacological management of humans infected with avianinfluenza A (H5N1) virus, May 2006.
- WHO interim guidelines on clinical management of humans infected by influenza A(H5N1),August 2007.
- WHO guidelines for clinical management of human infection with new influenza A (H1N1) virus:Initial Guidance, May 2009.
- WHO Guidelines for pharmacological management of pandemic (H1N1) 2009 influenza andother influenza viruses, 20 August 2009.
- Recommended laboratory tests to identify avian influenza virus A in specimens from humans,WHO, revised August 2007.
- Collecting, preserving and shipping specimens for the diagnosis of avian influenza A(H5N1) virusinfection. Guide for field operations, October 2006 WHO/CDS/EPR/ARO/2006.1

HYPERTENSION

Background

- **Hypertension** or **high blood pressure** (HBP) is a chronic condition in which the blood pressure in thearteries is elevated. It is classified as either primary (essential) or secondary. 'Primary' Hypertensionis elevated blood pressure where no medical cause is found. 'Secondary' Hypertension is caused byother conditions that affect the arteries, heart, endocrine system or kidneys.
- Hypertension is a major risk factor for cardiovascular diseases such as heart attack or stroke. According to The World Health Report 2001, cardiovascular disease related deaths are increasing inthe African Region, and in 2000 accounted for 9.2% of the total deaths in the African Region. Prevalence ranges from 25% to 35% in adults aged 25 to 64 years.
- Hypertension affects approximately 1 billion worldwide and it is estimated that more than 20 million people in the African Region are affected.
- Major risk factors for hypertension are ageing, lack of physical activity, obesity, and a diet high in salt and fat. Other risk factors include; tobacco and alcohol use.
- Lifestyle modifications shown to lower BP include; weight reduction for individuals who areoverweight or obese, reducing the amount of fat and salt in the diet, and eating more fresh fruits and vegetables, increased physical activity, and reduction of alcohol and tobacco consumption.

Surveillance goal

- Prevention of secondary illness by early detection and standardized treatment
- Estimation of disease burden and reduction of identified risk factors
- Monitor control and prevention activities

HYPERTENSION

Standard case definition

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

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

**** Report only the new case as diagnosed in the health centre***

Recommended public health action

- Health promotion for non-communicable diseases focusing on HBP should be established, including community-based education on behavior change and adoption of healthy lifestyles
- Promote secondary prevention and treatment interventions at health facilities according to nationalguidelines.

Analyze and interpret data

Time: Graph cases quarterly to analyze trends.

Place: Compare sub-county trends with national and regional trends.

Person: Analyze the distribution of cases by age and other demographic factors.

****Data for non-communicable diseases is often analyzed for long term trends***

Laboratory confirmation

Diagnosis is clinical.

Reference

- WHO, Atlas of heart disease and stroke, Geneva, World Health Organization, 2004.
- Non communicable Diseases: A strategy for the African Region, AFR/RC50/10
- Cardiovascular Diseases in the African Region: Current situation and perspectives, AFR/RC55/12
- http://www.who.int/chp/steps/en/
- http://www.afro.who.int/dnc/databases/afro_infobase/index.html
- WHO CVD-risk management package for low-and medium resource settings.
- "The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure" U.S. Department of health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute, NIH Publication No. 03-5233, December 2003
- Handbook of Hypertension, Vol 20. Editor; C.J. Bulpitt, 2000
- http://www.cdc.gov/bloodpressure/

INFLUENZA-LIKE ILLNESS (ILI)

Background

- Respiratory infections are a significant cause of infectious disease morbidity and mortality in the world. The mortality rates are particularly high among infants, children and the elderly. However, the burden of disease is not well characterized in Africa.
- The most common pathogens causing respiratory infections are; Streptococcus pneumoniae,Haemophilus influenzae type b (Hib), Staphylococcus aureus and other bacterial species, RespiratorySyncytial Virus (RSV), measles virus, human parainfluenza viruses type 1, 2, and 3 (PIV-1, PIV-2 andPIV-3), influenza virus and varicella virus.
- An improved understanding of the epidemiology and seasonality of respiratory infections in Africa isessential for optimizing public health strategies for their prevention and control (e.g., vaccines and antivirals for prophylaxis and treatment, infection control).
- The threat of respiratory infections due to novel organisms that have epidemic or pandemic potential warrants special precautions and preparedness. Respiratory disease events that may constitute a public health emergency of international concern include; Severe Acute Respiratory Syndrome (SARS); human influenza caused by a new subtype, including human episodes of avian influenza; pneumonic plague; and novel agents that can cause large-scale SARI outbreaks with highmorbidity and mortality.
- Surveillance for respiratory infections is based on the Influenza-like Illness (ILI) case definition. Lab-based surveillance or investigations using the ILI case definition is used to identify the disease causing pathogen.

Surveillance goals

- Early detection of unusual events that might indicate a shift in the severity or pattern of diseaseassociated with influenza, or emergence of a new influenza strain.
- Establish and monitor baseline rates of severe respiratory disease, including monitoring the severityand impact of influenza,
- Describe and monitor vulnerable groups at highest risk of severe disease
- Detection of antigenic or genetic changes in circulating viruses or the appearance of antiviralresistance.

Standard case definition

Influenza-like Illness: A person with:

- Sudden onset of fever > 38 ºC AND
- Cough or sore throat in the absence of other diagnoses.

A confirmed case of influenza is a case that meets the clinical case definition and is laboratory confirmed(laboratory results must be positive for influenza virus).

Respond to an alert threshold

If there is an unusual event (a cluster of deaths, for example) of respiratory infection, or if a single caseof pandemic-prone acute respiratory disease is suspected:

- Unusual cases of influenza-like illness.
- Health-care workers with only occupational exposure risks develop ILI after providing care to patients with ILI.
- Two or more children and/or adults presenting with a respiratory infection or who died from a respiratory infection with onset of illness in a two-week period and in the same geographical area and/or are epidemiologically linked.
- Persons who have contact with birds/animals present with ILI;

INFLUENZA-LIKE ILLNESS (ILI)

- Any rumor of clusters of acute respiratory infections or of atypical respiratory infections

Respond to a suspected case of an epidemic- or pandemic-prone acute respiratory disease or to an usualevent of severe acute respiratory infections:

- Report case-based information immediately to the appropriate levels.
- Practice infection control precautions for an acute respiratory disease with epidemic/pandemic potential (e.g., Standard plus Contact plus Droplet Precautions) immediately and enhance StandardPrecautions throughout the health care setting.
- Treat and manage the patient according to national guidelines.
- Collect and transport laboratory specimens from case-patient and from symptomatic contacts andarrange for laboratory testing
- Review clinical history and exposure history during 7days before disease onset.
- Identify and follow-up close contacts of case-patient.
- Conduct active searches for additional cases.
- Conduct risk assessment to guide decision-making
- Public health measures related to international border and travel should be implemented under theframework of the international health regulations (2005)

Analyze and interpret data

Time: Graph cases and deaths weekly. Describe changes in the level of respiratory activity compared tothe previous week. Construct an epidemic curve throughout the year and describe transmission patterns. **Person:** Characterize the illness in terms of clinical presentation, the spectrum of disease including severity of illness, count and report cases and deaths, the proportion of cases requiring hospitalization,clinical outcomes, case fatality ratio, attack rates by age/occupation/blood relation, laboratory confirmed cases. Describe the overall level of respiratory disease activity. Immediate case-based reporting of cases and deaths. During the outbreak, Analyze age and sex distribution. Assess risk factorsimmediately

Place: Describe the degree of disruption of schools, health care infrastructure, workplace and point ofentry (PoE). Ascertain whether any evidence exists that the virus may have increased it ability to causehuman disease or improved its transmissibility. Also use trends of flu remedies and painkillers sales

Laboratory confirmation

Further technical information on the role of laboratory can be found in the WHO guideline on sentinel surveillance of influenza viruses

Reference

- World Health Organization – Acute Respiratory Infections http://www.who.int/vaccine_research/diseases/ari/en/index.html
- World Health Organization – Influenza resources http://www.who.int/csr/disease/influenza/inforesources/en/index.html
- World Health Organization – Influenza Fact Sheet http://www.who.int/mediacentre/factsheets/2003/fs211/en/
- World Health Organization - Interim guidelines on infection prevention and control of epidemic-and pandemic-prone acute respiratory diseases in health care, June 2007 http://www.who.int/csr/resources/publications/WHO_CD_EPR_2007_6/en/index.html
- World Health Organization - Guidelines for investigation of human cases of avian influenza A (H5N1), January 2007. http://www.who.int/csr/resources/publications/influenza/WHO_CDS_EPR_GIP_2006_4/en/index.ht ml
- World Health Organization - Collecting, preserving and shipping specimens for the diagnosis of

INFLUENZA-LIKE ILLNESS (ILI)

avian influenza A (H5N1) virus infection. Guide for field operations, October 2006. http://www.who.int/csr/resources/publications/surveillance/WHO_CDS_EPR_ARO_2006_1/en/index.html

- World Health Organization - Guidelines for the collection of human specimens for laboratorydiagnosis of avian influenza infection, 12 January 2005. http://www.who.int/csr/disease/avian_influenza/guidelines/humanspecimens/en/

INJURIES (ROAD TRAFFIC ACCIDENTS)

Background

- Injury is a physical damage resulting when the human body is briefly or suddenly subjected to levelsof energy exceeding its physiological tolerance or the impairment in function resulting from the lackof one or more vital elements (water, air, warmth) .The energy causing the injury can be mechanical,electrical, thermal, radiant or chemical. Injury is classified as intentional and unintentional.
- All injuries account for 10% of the world's deaths. 5.8 million People die each year as a result of different types of injuries. Of the all systems that people have to deal with on a daily basis; road transport is the most complex and the most dangerous.
- Road traffic accidents result in unintentional injury.
- A traffic collision (motor vehicle collision, motor vehicle accident, car accident, or car crash) occurs when a road vehicle collides with another vehicle, pedestrian, animal, road debris, or othergeographical or architectural obstacle. Traffic collisions can result in injury, property damage, and death.
- Worldwide, the number of people killed in road traffic crashes each year is estimated at 1.2 million,while the number of injured could be as high as 50 million.
- Road traffic injuries are a major but neglected global public health problem, requiring concerted efforts for effective and sustainable prevention.
- Road traffic injuries continue to be among the leading causes of death and disability among young people aged between 5 and 44 years and the leading cause of death in the category of people between 15-29 years. The majority of such deaths are currently among "vulnerable road users"- pedestrians, pedal cyclists and motorcyclists.
- Without increased efforts and new initiatives, the total number of road traffic deaths worldwide andinjuries is forecast to rise by some 67% by 2020, and in low income and middle-income countries deaths are expected to increase by as much as 83%
- The African region has the highest fatality rate for road traffic crashes at 32/100 000 population
- Road traffic injuries are preventable. Very substantial reductions in juries can be achieved by implementing measures which address risk factors (excessive and inappropriate speed, driving underthe influence of alcohol, non-use of seat belts and child restraints, non- use of helmets for cyclists)

Surveillance goal

- Estimate and monitor incidence of road traffic injuries and related outcomes
- Identify risk factors and high risk areas to inform prevention policy and programs
- Evaluate programmes aimed at preventing road traffic injuries
- Establish alert thresholds for fatalities to allow health facility personnel review care and servicesprovided to injured persons
- Establish incidence alert thresholds and monitor trends to enable sub-county health personnel informrelevant stakeholders

INJURIES (ROAD TRAFFIC ACCIDENTS)

Standard case definition

Road traffic injury: Any person who has sustained an injury as a result of a road traffic crash presentingfor the first time.
Road traffic fatality: Any person killed immediately or dying within 30 days as a result of an injury crash.

Respond to alert threshold

- Promote primary prevention by supporting interventions to address risk factors
- Review and monitor care and services provided to injured persons
- Review arrangements for mass casualty management

Respond to action threshold

- Step up enforcement of measures to address risk factors
- Activate mass casualty management system

Analyze and interpret data

Person: Analyze the distribution of cases by sex, age and other demographic factors
Time: Graphs to show monthly figures of cases and deaths, curves for the year to depict trends**Place**: Plot location of cases and identify high risk areas

Laboratory confirmation

Imaging of the injured person - when required

Reference

- WHO-2004, World Health report
- WHO- 2010 Status report on Road Safety in Africa
- WHO, 2004-Peden,M.; et al (eds) World report on Road Traffic Injury prevention
- WHO,2001- Holder Y., Peden M., Krug E. et al(eds) Injury Surveillance Guidelines, Geneva
- Harvey A,(Ed).*Data systems*, Geneva, World Health Organisation,2010

LEPROSY

Background

- Leprosy is a chronic mycobacterial disease of the skin, the peripheral nerves and upper airway mucous membranes. The disease is transmitted mainly through airborne spread from nasal secretionsof patients infected by Hansen's bacillus and also through inoculation into broken skin. Leprosy is endemic in several tropical areas around the world, including Africa.
- Patients are classified into two groups, depending on presence of skin and nerve signs:
  - Multibacillary patients (MB) with more than 5 skin patches and several nerve enlargements.
  - Paucibacillary patients (PB) with one to five skin patches and a single nerve enlargement.
- Leprosy control has improved greatly through use of WHO recommended multidrug therapy (MDT). Multiple drug therapy combining two or three drugs (rifampicin, clofaximine and dapsone) is very effective in curing leprosy. At the end of 1999, leprosy point prevalence in African countries was 1.6cases per 10 000 population with about 70 000 registered cases.
- Incubation period is 6 months to 20 years or more. Infection is probably frequent but clinical diseaseis rare, even among the closest contacts of patients. Multibacillary patients are most contagious, butinfectiousness is reduced rapidly as soon as multiple drug therapy begins. Leprosy can be complicatedby neuritis and leprosy reactions, resulting in impairment and disabilities of hands, feet, and eyes.
- Leprosy has historically been associated with social isolation and psychosocial consequences. This social stigma still persists in some countries in Africa.

LEPROSY

- Some skin diseases such as tinea versicolor, mycosis, vitiligo, Scleroderma, psoriasis, systemic lupus erythematosus and Von Recklinghausen disease may be mistaken for leprosy.

Surveillance goal

- Observe national trends towards the leprosy elimination target, defined as a reduction in prevalenceto less than 1 case per 10 000 population.
- Monitor resistance of Hansen's bacillus to drugs used for multi-drug therapy (MTD) on an ongoingbasis.
- As leprosy nears elimination, supplement routine surveillance with community-based surveillance.

Standard case definition

Suspected case: A person showing one of three cardinal signs of leprosy: hypo-pigmented or reddish skinlesion, loss or decrease of sensations in skin patch, enlargement or peripheral nerve.
***Confirmed case*:** A person showing at least two cardinal signs of leprosy and who has not completed afull course of treatment with multidrug therapy (MDT).

Respond to alert threshold

If a single case is suspected:

- Report the suspected case to the appropriate level of the health system.
- Investigate case for risk factors.
- Begin appropriate case management:
  - MB patients must be treated for 12 months with a three-drug regimen (12 MB blister packs to betaken in a period of 18 months).
  - PB patients must be treated for 6 months with a two drugs MDT regimen (6 PB blister packs tobe taken in a period of 9 months)

Respond to action threshold

If a suspected case is confirmed:

- Examine patients for skin and nerve signs at each contact that the patient has with a health worker todiagnose and care for leprosy reactions and impairments.
- Examine risk factors for treatment interruption (for example, inadequate supplies of MDT in the health centre, poor accessibility of patients' villages, and so on). Give sufficient blister packs for a full course of treatment to patients unable to attend a health centre monthly.
- Identify any fast increase or decrease of new cases during a period. Assess adequacy of surveillance inareas where under- or ever-reporting is suspected. Monitor distribution of MDT drugs.

Analyze and interpret data

Time: Graph cases by date diagnosed and treatment begun.
Place: Plot cases by location of households and disease classification (MB or PB)
Person: Count newly detected cases monthly by the type of leprosy (MB or PB). Analyze age anddisability distribution and treatment outcomes (cases cured, defaulted, relapsed).

Laboratory confirmation

Zn Staining

Reference

- Enhanced global Strategy for Further Reducing the Disease Burden due to Leprosy (SEA-GLP-2009.3)
- WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2

LYMPHATIC FILARIASIS

Background

- Lymphatic filariasis is the second leading cause of permanent and long-term disability worldwide. Itaffects over 120 million persons in 80 countries, and over 40 million persons are seriouslyincapacitated by the disease; 20% of the world population is at-risk of infection. Of those infected, roughly 1/3 are in India, 1/3 in Africa, and the rest in the Americas, Asia, and the Pacific. In 1997, resolution WHA50.29 called for the elimination of lymphatic filariasis as a global public health problem. The strategy adopted is based on:
  - Reducing transmission below a threshold where new infection ceases to occur
  - Treatment of the problems associated with disability control and prevention.
- Causal agents:in Africa only the filariae *Wuchereria bancrofti*, *Brugia malayi*, and *Brugia timori*
- Modes of transmission: transmitted by various species of mosquitoes, these parasitic filarial worms lodge in the human lymphatic system, producing millions of immature microfilariae that circulate in the blood. Microfilariae appear in the peripheral blood after 3 to 6 months for *Brugia malayi*, 6 to 12 months for *Wuchereria bancrofti*, often with nocturnal periodicity. When a mosquito thereafterbites the infected person, the microfilariae are picked up and the infection may be transmitted to others after about 2 weeks.
- Clinical description:
  - Filarial infection may be clinically asymptomatic (even in the presence of laboratory evidence oflymphatic and kidney damage); the disease may also present as one or more acute manifestations (fever, local swellings, tropical pulmonary eosinophilia syndrome, lymphangitis).
- Chronic complications include:
  - Lymphoedema or elephantiasis of the limbs
  - Damage to the genital organs (including hydrocoele in men)
  - Damage to the kidney (including chyluria) and lymphatic system.

Surveillance goal

There are currently 3 options and the choice will depend on the local situation:

1. Routine monthly reporting of aggregated data on probable and confirmed cases from periphery to intermediate level and to central level
2. Sentinel population surveys (standardized and periodical),
3. Active case-finding through surveys of selected groups or through mass surveys. International:Annual reporting from central level to WHO (for a limited number of countries).

Standard case definition

Resident of an endemic area with a clinical sign of hydrocoele or lymphoedema for which other causes of these findings have been excluded and/or a person with positive laboratory diagnosis ofmicrofilaremia in blood smear, filarial antigenaemia or positive ultrasound test.

Respond to alert threshold

- Confirm community prevalence of infection by surveys

Respond to action threshold

Case management

Hygiene measures for the affected body parts (and, when necessary, antibiotics and antifungal agents)can decrease the risk of adenolymphangitis:

- Washing the affected parts twice daily with soap and water
- Raising the affected limb at night
- Exercising to promote lymph flow
- Keeping nails short and clean

LYMPHATIC FILARIASIS

- Wearing comfortable footwear
- Using antiseptic or antibiotic creams to treat small wounds or abrasions, or in severe cases systemicantibiotics.

For the treatment of filarial carriers, the regimen recommended by the country is to be followed:

- In areas where there is neither Onchocerciasis nor loiasis: DEC 6 mg/kg single dose.
- In areas where Onchocerciasis has been excluded but not loiasis: individual clinical decision.

The current strategy for Filariasis control rests essentially on anti-parasitic measures. To interrupttransmission, the entire at-risk population must be given a yearly, 1-dose regimen of the following:

Areas with concurrent onchocerciasis:

- 400 mg of albendazole + ivermectin 150 micrograms per kg of body weight once a year for 4-6years

Areas with no concurrent Onchocerciasis

- Diethylcarbamazine 6 milligrams per kg of body weight + albendazole 400 mg once a year, or
- Diethylcarbamazine fortified salt for daily use for at least 6-12 months.

NOTE: In areas with *concurrent loiasis* (sub-Saharan Africa rain forest), mass interventions cannot at present be envisaged systematically (unless Onchocerciasis is a severe public health problem), because ofthe risk of severe adverse reactions in patients with high-density *Loa* infections (about 1 in 10,000 treatments).

It is important to educate the population on the importance of compliance during mass chemotherapy. Special efforts for vector control are not required as regards lymphatic Filariasis. They should be carried out under other existing vector control programmes such as anti-malaria vector control operations.

Analyze and interpret data

- Map the distribution of lymphatic Filariasis and identify implementation units that will require mass drug administration
- Analyze the drug coverage in implementation units
- Assess the decline of parasitological indices microfilaremia before starting MDA and after at least fourrounds of MDA till the criteria of less than 1% microfilaraemia in the population and less than 0.1%antigenaemia in school entry children is achieved

Laboratory confirmation

Diagnostic test	▪ Night blood smear ▪ Filarial antigen test
Specimen	▪ Blood smear ▪ Blood
When to collect	▪ Night between 10pm and 2am ▪ Any time of the day
How to prepare, store, and transport	Spread three drops of blood on a glass slide and spread across the slide to make three lines. After fixing with heat stain with Geimsa stain and examine under microscope Either a rapid ICT card test or by a lab based ELISA test
Results	Positive test is when microfilarieae of W.bancrofti is seen under the microscope Positive if filarial antigen is detected

Reference

- WHO.Monitoring and epidemiological assessment of the programme to eliminate lymphatic filariasis at implementation unit level WHO/CDS/CPE/CEE/2005.50

LYMPHATIC FILARIASIS

- WHO. *Lymphatic filariasis.* WHO/CDS/CPE/SMT/2001.7
- *WHO. Training module on lymphatic filariasis for drug distributors (in countries whereonchoerciasis is not co-endemic).* WHO/CDS/CPE/CEE/2000.10 (Parts 1 &2)
- *WHO. Training module on lymphatic filariasis for drug distributors (in countries whereonchoerciasis is co-endemic).* WHO/CDS/CPE/CEE/2000.11 (Parts 1 & 2)
- *WHO. The programme to eliminate lymphatic filariasis – essential elements for medicalpersonnel (in countries where onchoerciasis is not co-endemic).* WHO/CDS/CPE/CEE/2000.12
- *WHO. The programme to eliminate lymphatic filariasis – essential elements for medicalpersonnel (in countries where onchoerciasis is co-endemic).* WHO/CDS/CPE/CEE/2000.13
- WHO. *Preparing and implementing a national plan to eliminate filariasis (in countries where onchoerciasis is not co-endemic).* WHO/CDS/CPE/CEE/2000.15
- WHO. *The programme to eliminate lymphatic filariasis* (in onchoerciasis co-endemic countries). WHO//CDS/CPE/CEE/2000.16 Webpage: www.who.int/lymphatic_filariasis

MALARIA

Background

- Malaria is a highly prevalent tropical illness with fever following the bite of infected female Anopheles mosquitoes which transmit a parasite, *Plasmodium falciparum, P. ovale, P. vivax,* or *P.malariae*. Serious malarial infections are usually due to *P. falciparum* which may result in severe anaemia and vital organ involvement.
- Malaria is one of the leading causes of illness and death in many African countries. There are 900 000 deaths per year in Africa mainly in children less than 5 years of age and pregnant women.
- Incubation period from the time of being bitten to onset of symptoms is 7 to 30 days. The incubation period may be longer, especially with non- *P. falciparum* species.
- Transmission of malaria is highly seasonal in some areas in African countries but is perennial in the rest of the region

Surveillance goal

- Detect malaria epidemics promptly, especially in areas with seasonal epidemic transmission or with alarge population at-risk.

Standard case definition

Uncomplicated malaria: Any person living in area at rsik of malaria with fever or history of fever within24 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 withlaboratory confirmation of diagnosis by malaria blood film or other diagnostic test for malaria parasites.***Unconfirmed severe malaria:*** Any patient living in area at rsik of malaria hospitalised with severe febriledisease with accompanying vital organ dysfunction diagnosed clinically

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

Respond to alert threshold

If there is an unusual increase in the number of new malaria cases or deaths as compared to the sameperiod in previous non-epidemic years:

- Report suspected epidemic to the next level

MALARIA	
▪ Treat with appropriate anti-malarial drugs according to national program recommendations ▪ Investigate the cause for the increase in new cases ▪ Make sure new cases in children age 2 months up to 5 years are managed according to IMCIguidelines. ▪ Conduct community education for prompt detection of cases and access to health facilities.	
Respond to action threshold	
If the number of new cases exceeds the upper limit of cases seen in a previous non-epidemic period inprevious years: ▪ Evaluate and improve, as needed, prevention strategies, such as use of ITNs and IRS for all at-riskof malaria.	
Analyze and interpret data	
Time: Graph the number of cases by month/week. Construct an epidemic curve during epidemics.**Place:** Plot location of households for new cases and deaths. **Person:** Count the number of new malaria cases and deaths by month and analyze age groups and timeof onset.	
Laboratory confirmation	
Diagnostic test	▪ Microscopy: Presence of malarial parasites in blood films for suspected cases ▪ Malaria Rapid diagnostic test: Positive or negative test
Specimen	Blood: Usually finger-stick sample for all ages or other accepted method for collecting blood from very young children
When to collect	*For blood smear:* prepare blood film for all suspected cases admitted to inpatientfacility, or according to national malaria case management guidelines
How to prepare, store, and transport	Blood smear: ▪ Collect blood directly onto correctly cleaned and labelled microscope slides andprepare thick and thin smears. ▪ Allow smears to dry thoroughly ▪ Stain using the appropriate stain and technique ▪ Store stained and thoroughly dried slides at room temperature out of directsunlight. For rapid diagnostic tset: Collect specimen and perform test according tomanufacturers' instructions.
Results	Thick and thin smear results can be available the same day as preparation. Microscopic examination of malarial slides may also reveal the presence of otherblood-borne parasites. RDT result is obtained immediately. ***Note: In the inpatient setting, perform a hemoglobin estimation laboratory test toconfirm severe anaemia, in children 2 months to 5 years in age.***
Reference	
▪ Malaria epidemics: Detection and control, forecasting and prevention. Geneva. World Health Organization. WHO/MAL/98.1084 ▪ "Basic Laboratory Methods in Medical Parasitology" WHO, Geneva, 1991	

a. Setting malaria action (epidemic) threshold:

The national Malaria Control Program can assist sub-counties and health centres with determining appropriate thresholds for detecting possible epidemics. In the absence of a threshold set by thenational program, the following method can be used to determine the threshold level for a malaria epidemic. The threshold is determined using the median and the 3rd Quartile of a periodof time (for example, 5-year data from a health facility or sub-county by month/week):

1. Look at the number of malaria cases at a specific health facility or sub-county by month/weekfor the past 5 years.
2. Determine the median for each month/week (for example, each January for the last 5 years). Rank the monthly/weekly data for each month/week for the five years inascending order. Identify the number in the middle of each month's/week's series for the five years. This is the median. Repeat this process for each month/week in the five years.
3. Determine the 3rd Quartile for the monthly/weekly series by identifying the 4th highest number from the bottom in each data series (since data is ranked in ascending order). Thisis the 3rd Quartile representing the upper limit of the expected normal number of malariacases.
4. Plot the 3rd Quartile for each data series by month/week for the five year period and jointhe points with a line. The line represents the upper limit of the expected number of cases.
5. Plot the median for each data series by month/week for the five year period and join thepoints with a line. This line represents the lowest limit of expected number of cases.
6. The area between the two lines (the median and the 3rd Quartile) represents the "normalchannel". If the number of currently observed cases of malaria falls between the two lines,the number of new cases for that month/week is assumed to be "normal". If the numberis above the 3rd Quartile (upper limit), this is an indication of a possible malaria epidemic.

Please note that to ensure early detection and control of malaria epidemics, it is preferable to useweekly surveillance data in Malaria epidemic prone areas.

Source: WHO/AFRO Regional Malaria Program

MALNUTRITION IN CHILDREN UNDER 5

Background

- Globally, maternal and child under-nutrition are underlying causes for 3·5 million deaths, including 35% of the disease burden in children younger than 5 years. Of the 40 countries with a child stunting prevalence of 40% or more, 23 are in Africa.
- Severe malnutrition may act as a direct cause of death or an indirect cause by increasing dramaticallythe number of deaths in children suffering from common childhood illnesses such as diarrhea and pneumonia.
- Despite the above, the burden of child mortality due to severe malnutrition remains largely absent from the international health agenda and few countries, even in high prevalence areas, have specificnational policies aimed at addressing it comprehensively.
- The most vulnerable are children under five and pregnant and lactating women. The poor nutritional status and nutritional intake of pregnant women may contribute to newborns with low birth weight (a weight measured immediately after birth). A newborn weighing less than 2500 grams
  (2.5 kilos or 5.5 pounds) is considered a newborn with low birth weight (LBW). LBW is a major

MALNUTRITION IN CHILDREN UNDER 5

determinant of death, illness and disability in infancy and childhood and also impacts health outcomes in adult life.

- Socio-economic conditions, poor water and sanitation, mothers' nutritional education on how to feed babies and young children, and repeated infections are the main causes of malnutrition.
- Programmes elaborated to eradicate malnutrition are on food security, water and sanitation, promotion of infant and young children feeding practices, micronutrient supplementation programmes management of severe cases of malnutrition in the communities and in the health facilities, management of infections mainly diarrheal disease.
- Many sporadic surveys are being organized, but nutrition surveillance is currently poorly implemented and does not allow for interventions related to prevention and management of malnutrition.

Surveillance goal

- Early warning and problem identification.
- Policy-making and planning.
- Programme management and evaluation.
- Assess effectiveness of public health response that address causes of low birth weight, malnutrition inchildren and malnutrition in pregnant women

Standard case definition

Low birth weight newborns: Any new born with a birth weight less than 2500 grams (or 5.5 lbs)**Malnutrition in children:**

- Children under five who are underweight (indicator: weight for age<-2 ZScore) **OR**
- Children 6 to 59 months with MUAC<11.5 cm (high risk of mortality) **OR**
- Bilateral pitting oedema

Response to alert threshold

If more than 20% of children are underweight:

Programme emphasis on

- Breastfeeding support
- Nutrition education
- Supplementation of child and mother
- Prevention and treatment of diarrhea
- Prevention and treatment of severe malnutrition
- Socio-economic support

As soon as one case with MUAC less than 11.5 cm is detected or presence of bilateral oedema identified: Alert, further investigation should be conducted. In addition, refer the child to a therapeutic feeding programme.

If more or equal than 15% of low birth weight are less than 2.5 Kg:

Targeting interventions for improved antenatal care for women and neonatal care of infants including nutritional care (anti-smoking and anti-alcohol campaigns, nutritional care for women before and duringantenatal and during lactating period, malaria prophylaxis, new-born care facilities, etc.) to those at-riskof poor pregnancy outcomes and treat new born to prevent morbidity and death.

Analyze and interpret data

Time: Graph cases monthly to analyze trends and weekly in emergency**Place:** Plot location of households/community with cases

Person: Count monthly/weekly cases and analyze age and gender distribution

Laboratory confirmation

MALNUTRITION IN CHILDREN UNDER 5

Routine laboratory confirmation for surveillance is not required.

Reference

- Maternal and child undernutrition: global and regional exposures and health consequences: Black R.E. et al : The Lancet, Volume 371, Issue 9608, Pages 243 – 260.
- Gross R, Webb P, Wasting time for wasted children: severe child undernutrition must be resolved innon-emergency settings. Lancet 2006; 367: 1209-1211.
- Physical status: the use and interpretation of anthropometry Report of a WHO Expert Committee.WHO Technical Report Series, 1995, No 854: 81, 128-130, 198-208.
- WHO child growth standards and the identification of severe acute malnutrition in infants and children. A Joint Statement by the World Health Organization and the United Nations Children's Fund

MATERNAL DEATHS

Background

- The death of a woman while pregnant or within 42 dayys of termination of pregnancy, irrespective of he duration and the site of pregnancy from any cause related to or aggravated by the pregnancyor its management but not from accidental or incidental causes. Globally, about 80% of maternal deaths are due to; severe bleeding (mostly bleeding postpartum), infections (also mostly soon after delivery), hypertensive disorders in pregnancy (eclampsia) and obstructed labor. Complications afterunsafe abortion cause 13% of maternal deaths.
- Across the developing world, maternal mortality levels remain too high, with more than 500,000 women dying every year as a result of complications during pregnancy and childbirth. About half of these deaths occur in sub-Saharan Africa where a woman's lifetime risk of maternal death is 1 in 22, compared with 1 in 8,000 in industrialized countries.
- Hemorrhage is the leading cause of maternal death in sub-Saharan Africa, and unattended births are aparticular risk, especially in rural areas where transport to health care facilities is a problem.

Surveillance goal

- Estimate and monitor maternal mortality rates.
- Identify risk factors and high-risk areas for maternal mortality to inform program decisions.
- Evaluate programs aimed at reducing maternal mortality.

Standard case definition

The death of a woman while pregnant or within 42 days of delivery or termination of a pregnancy:

- Irrespective of the duration and site of the pregnancy
- From any cause related to or aggravated by the pregnancy or its management
- But not from accidental or incidental causes

Recommended public health action

- Monitor trends
- Increase availability, accesibility and use of early attendance of antenatal care
- Early detection of pregnancy complications
- Provide specialized training to profession birth attendants
- Support interventions to improve recognition and response to high-risk pregnancies at thecommunity level
- Report to the appropriate levels immediately
- Avail IEC to the community through the community strategy

MATERNAL DEATHS

- Improve health facility preparedness capacity to pregnancy complications

Analyze and interpret data

Time: Graph cases to construct an epidemic curve throughout the year in order to identify trends.**Place:** Plot the location of cases and analyze the distribution.
Person: Analyze the distribution of cases by age and other demographic factors.

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

- http://www.who.int/making_pregnancy_safer/topics/maternal_mortality/en/index.html
- http://www.unicef.org/index.php
- National guidelines for Maternal and Perinatal deaths Notification and Review, Ministry of pubic health and sanitation, Division of Reproduction Health

MDR/XDR TB

Background

- Multidrug-resistant TB (MDR-TB) is caused by bacteria that are resistant to at least ionized and rifampicin, the most effective anti-TB drugs. MDR-TB results from either primary infection with resistant bacteria or may develop in the course of a patient's treatment
- Extensively drug-resistant TB (XDR-TB) is a form of TB caused by bacteria that are resistant to isoniazid and rifampicin (i.e., MDR-TB) as well as any fluoroquinolone and any of the second-line anti-TB injectable drugs (amikacin, kanamycin or capreomycin)
- These forms of TB do not respond to the standard six-month treatment with 1st-line anti-TB drugs andcan take up to two years or more to treat with drugs that are less potent, more toxic and much moreexpensive
- Among all incident TB cases globally, 3.6% are estimated to have MDR-TB
- Possible risk factors include; HIV infection, male sex, previous incarceration, failed TB treatment andrelapse following standard TB treatment

Surveillance goal

- Early detection and treatment of persons with MDR/XDR TB to improve chances of clinicalimprovement and reduce transmission of MDR/XDR TB
- Identify areas/populations at high risk to target prevention and control measures.
- Estimate burden of disease.

Standard case definition

Suspected MDR- TB case: Any patient presenting with TB and

- Has been on re-treatment and who's sputum smear remains positive after three months' ofintensive therapy **or**
- Has had TB treatment for at least 5 months and still sputum positive **or**
- Return after default (missed two clinic days or 1 month) **or**
- Relapse after complete treatment within 2 years **or**
- Close contact (residing in same house hold) of a MDR Tuberculosis case **or**
- A health care worker **or**
- An Immigrant

Confirmed MDR TB: Positive diagnoses with TB culture and drug-resistance test reveals resistant to Isoniazid and Rifampincin

Suspected XDR TB case: Any patient with MDR TB with worsening signs and symptoms while on

treatment
OR
A contact with an XDR TB patient presenting with TB

Confirmed XDR TB: Positive diagnoses with TB culture and drug resistance test reveals resistance toIsoniazid, Rifampicin, an injectable drug (kanamycin, amikacin etc.) and a floroquinolone.

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the appropriate levels (public health sector and animalhealth sector)
- Collect specimen safely to confirm the case
- Treat and manage the patient with normal Tb regimen
- If hospitalization is required isolate the patient
- Collect specimen safely to confirm the case.

Respond to action threshold

If a single case is confirmed:

- Treat patient with the individualized anti-MDR/ anti-XDR regimen with DOTS plus (observation is bya health care worker for the 2 years)
- Standard infection control precautions are sufficient and should be used when managing the patients
- Request additional help from national level as required
- Monitor for side effects and patients improvement

Analyze and interpret data

Person: Analyze age and sex distribution. Assess risk factors and plan disease control interventionsaccordingly.
Time: Graph cases and deaths monthly.
Place: Map locations of cases' households and work sites.

Laboratory confirmation

Diagnostic test	Microscopy: Presence of Acid Fast Bacillus (AFB) in Ziehl Neelsen (ZN) stained smears Culture and identification Drug susceptibility test: Anti-tuberculosis drug resistance occurs when a strain of *Mycobacterium tuberculosis* isolate is resistant to one or more antimicrobial agents as evidenced by internationally recommended methods for susceptibilitytests) MDR =Resistance to Isoniazid and Rifampicin; X-DR= Resistance to Isoniazid and Rifampicin (MDR); plus additional resistanceto a fluoroquinolone and a second-line injectable agent
Specimen	Deep-chest sputum Aspirates
When to collect the specimen	Collect 2 sputum specimens (not saliva) spot and early morning for direct smear microscopy and examine
How to prepare, store, and transport the specimen	Smear should be examined at health facility where the specimen is taken. In case long distance transportation is required e.g., for TB culture, specimenshould be placed in three containers, i.e.: 1. A primary container which has the specimen and is leak proof with ascrew-cap.

MDR/XDR TB

	2. A secondary container which is durable, waterproof and made of metal or plastic with a screw-cap. It should have enough absorptive material to absorb the contents of the primary container should the latter break or leak. On its outside, the details of the specimen should be pasted. 3. A tertiary container is usually made of wood or card box. It should be capable of withstanding the shocks and trauma of transportation
Results	The national reference laboratory should be linked to an Supranational reference laboratory by strain exchange to ensure quality control

Reference

- Anti –tuberculosis drug resistance in the world. Report No. 4 WHO/ 2008
- Treatment of Tuberculosis: Guidelines for National Programs. WHO/TB/97.230
- Policy Statement of Prevention Therapy Against TB in People Living with HIV, WHO/TB/98.255
- Laboratory Services in Tuberculosis Control, Parts I, II and III. WHO publications WHO/TB/98.258
- Guidelines to surveillance of drug resistance in tuberculosis 4th ed. WHO/HTM/TB/2009.422

MEASLES

Background

- Measles is a febrile rash illness due to paramyxovirus (*Morbillivirus)* transmitted human-to-humanvia airborne droplet spread. It is the fourth leading cause of death in children less than 5 years of agein many African countries.
- The incubation period is 7 to 18 days from exposure to onset of fever.
- Among children with vitamin A deficiency and malnutrition, measles may result in severe illness dueto the virus itself and associated bacterial infections, especially pneumonia; only the minority of casesare severe.
- Measles is among the most transmissible of human infections. Large outbreaks occur every few yearsin areas with low vaccine coverage and where there is an accumulation of persons who have neverbeen infected or vaccinated. The true incidence of measles far exceeds reported cases.
- Risk factors include low vaccine coverage (<85 to 90%) which allows accumulation of susceptible persons at high risk for measles. Outbreaks can be explosive in areas of high population density.
- Other viral illnesses such as rubella may cause or contribute to similar outbreaks.

Surveillance goal

- Detect outbreaks of fever with rash illness promptly:
- *In countries with a measles elimination target*: immediate case-based reporting of suspected cases and deaths of fever with rash illness; confirm all suspected measles cases with laboratory test (usuallyserum IgM).
- *In countries with accelerated measles control programs*: Summary reporting of cases and deaths forroutine surveillance and outbreaks; confirm the first five cases of suspected measles in a health facility per week with laboratory test (usually serum IgM)

Standard case definition

Suspected case: Any person with fever and maculopapular (non-vesicular) generalized rash and cough,coryza or conjunctivitis (red eyes) or any person in whom a clinician suspects measles.

Confirmed case: A suspected case with laboratory confirmation (positive IgM antibody) or

epidemiological link to confirmed cases in an outbreak.

Respond to alert threshold

If an outbreak is suspected: Five or more cases of suspected measles in a sub-county or health facility in amonth

- Record in a case based form and report suspected case to the next level.
- Collect blood sample for confirming the outbreak.
- Treat cases with oral rehydration, vitamin A, and antibiotics for prevention of bacterial super-infection. Use airborne isolation precautions where feasible.
- Investigate the case or outbreak to identify causes for outbreak.

Respond to action threshold

If an outbreak is confirmed: Three or more cases laboratory confirmed as IgM positive in a sub-county orhealth facility in a month

- Improve routine vaccine coverage through the EPI, and lead supplemental vaccination activities inareas of low vaccine coverage.
- Mobilize the community early to enable rapid case detection and treatment.

Analyze and interpret data

Time: Graph daily/weekly cases and deaths. Construct epidemic curve for outbreak cases.**Place:** Plot location of case households.

Person: Count total cases and analyze by age group, residence, sex and immunization status.

Laboratory confirmation

Diagnostic test	Presence of IgM antibodies to measles virus in serum.
Specimen	Serum Whole blood
When to collect the specimen	**In countries with pre-elimination target:** ▪ Collect specimen from suspected cases: Collect blood samples from the first 5 suspected cases (if there are more than 5 suspected cases). ▪ If the results are negative, continue collecting specimen. ▪ Once the first 3 specimen test positive, stop collecting specimen and start/continue linelisting further cases. ▪ Resume specimen collection if suspected cases start occurring three weeks or more after the last detected/line-listed cases in that outbreak area. If measles cases areconfirmed after that period, this should be considered as a new outbreak **In countries with an elimination target:** ▪ Collect specimen from every suspected case of measles ▪ Collect serum for antibody testing at first opportunity or first visit to the health facility.
How to prepare, store, and transport the specimen	▪ For children, collect 1 to 5 ml of venous blood depending on size of child. Collect into a test tube, capillary tube or microtainer. ▪ Separate blood cells from serum. Let clot retract for 30 to 60 minutes at room temperature. Centrifuge at 2000 rpm for 10-20 minutes and pour off serum intoa clean glass tube. ▪ If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clot

MEASLES

	retracts. Pour off serum the next morning. ▪ If no centrifuge and no refrigerator, let blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle). Pour off serum into a clean tube. ▪ Store serum at 4°C. ▪ Transport serum samples using appropriate packaging to prevent breaking or leaks during transport. ▪ Transport the serum in a specimen carrier/coolbox with frozen icebags to preventbacterial overgrowth (up to 7 days). If not refrigerated, serum stored in a clean tube will be good for at least 3 days.
Results	▪ The specimen should arrive at the laboratory within 3 days of being collected. ▪ Results are usually available after 7 days. ▪ If 3 out of the 5 suspected measles cases are laboratory confirmed, the outbreak is confirmed. ▪ Avoid shaking of specimen before serum has been collected. ▪ To prevent bacterial overgrowth, ensure that the serum is poured into a cleanglass test tube. The test tube does not need to be sterile, just clean.

Reference

- Using surveillance data and outbreak investigations to strengthen measles immunization programs,Geneva, World Health Organization. WHO/EPI/GEN/96.02
- WHO Guidelines for Epidemic Preparedness and Response to Measles Outbreaks WHO/CDS/CSR/ISR/99.1

MENINGOCOCCAL MENINGITIS

Background

- *Neisseria meningitidis*, *Haemophilus influenzae* type b (Hib), and *Streptococcus pneumoniae* constitute the majority of all cases of bacterial meningitis and 90% of bacterial meningitis in children.
- Meningococcal meningitis is the main form of epidemic meningitis and remains a major public healthchallenge in the African meningitis belt, an area that extends from Senegal to Ethiopia. In these countries, large outbreaks may occur during the dry season (e.g., November through May). Outsideof the meningitis belt, smaller outbreaks may occur year-round. The last major outbreak of meningococcal meningitis epidemic occurred in Kenya in West Pokot in 2006
- Epidemics in the meningitis belt are traditionally associated with *Neisseria meningitideis* serogroup Aalthough in 2002 an epidemic due to Nm serogroup W135 occurred in Burkina Farso and in 2006Nm serogroup X was isolated in Niger.
- Human-to-human disease transmission is via large respiratory droplets from the nose and throats ofinfected people.
- Incubation period is 2 to 10 days.
- Attack rates are highest among children aged less than 15 years. Case fatality rates are usually 8-15%among treated patients, and >70% among untreated cases. Many survivors suffer long-term sequelae including mental retardation, hearing loss and loss of limb use.
- Oily chloramphenicol is the drug of choice during epidemics because a single dose of this long-actingformulation has been shown to be effective. Antimicrobial resistance to chloramphenicol has not yet

been detected in Africa. However, resistance to sulphonamides is widespread.

- The current response to meningitis epidemics consists of reactive mass vaccination campaigns with bivalent (A and C) and/or trivalent polysaccharide vaccine (A, C, and W135) as soon as possible afteran epidemic has been declared. Polysaccharide vaccines do not protect very young children and only provide protection for up to three years resulting in repetitive meningitis outbreaks.
- A meningococcal A conjugate vaccine has been developed which is immunogenic in both infants andadults and is expected to confer long-term protection. It is expected that introduction of this conjugate vaccine into meningitis belt countries is likely to dramatically reduce the circulation of NmA and eliminate Nm A epidemics.

Surveillance goals

- To promptly detect meningitis outbreaks and to confirm etiology of meningitis outbreaks.
- To use the data to plan for treatment and vaccination supplies and other prevention and controlmeasures.
- To assess and monitor the spread and progress of the epidemic and the effectiveness of controlmeasures.
- To monitor the situation including serogroup shifts throughout the year.
- To perform periodic susceptibility testing for penicillin and chloramphenicol.

Standard case definition

Suspected case: Any person with sudden onset of fever (>38.5ºC rectal or 38.0ºC axillary) and one ofthe following signs: neck stiffness, altered consciousness or other meningeal signs.

Confirmed case: A suspected case confirmed by isolation of *N. meningitidis* from CSF or blood.

Respond to alert threshold

Alert threshold:

- For populations between 30 000 and 100 000 inhabitants, an attack rate of 5 cases per 100 000inhabitants per week.
- For populations less than 30 000 inhabitants, 2 cases in 1 week or an increase in the numbercompared to the same time in previous non-epidemic years.

Respond to alert threshold:

- Inform next level of health system
- Record cases on a line listing form
- Investigate and laboratory confirm the cases
- Treat all suspected cases with appropriate antibiotics as recommended by National protocol.
- Intensify surveillance for additional cases in the area
- Prepare to conduct a mass vaccination campaign

Respond to action threshold

Action threshold:

- For populations between 30 000 and 100,000: an attack rate of 15 cases per 100 000 inhabitants perweek. When the risk of an epidemic is high (no epidemic during last 3 years, alert threshold reachedin dry season), action (epidemic) threshold is 10 cases per 100 000 inhabitants per week.
- For populations less than 30 000 inhabitants: 5 cases in 1 week or the doubling of the number of cases over a 3-week period.

Respond to action threshold:

- Immediately vaccinate the epidemic sub-county as well as any contiguous sub-counties in alert phase.

MENINGOCOCCAL MENINGITIS

- Mobilize community to permit early case detection and treatment, and improve vaccine coverage during mass vaccination campaigns for outbreak control.
- Continue data collection, transmission and analysis.
- Maintain regular collection of 5-10 CSF specimens per week throughout the epidemic season in allaffected sub-counties to detect possible serogroup shift.
- Treat all cases with appropriate antibiotics as recommended by National guidelines

Analyze and interpret data

Time: In meningitis belt countries during epidemic season, graph weekly cases and deaths. Otherwise, graph monthly trends in cases and deaths. Construct an epidemic curve for outbreak cases.

Place: In epidemics (not in endemic situations), plot location of case households and estimate distanceto the nearest health facility.

Person: Count total sporadic and outbreak cases. Analyze age distribution.**Target case fatality rate:** <10%

Laboratory confirmation

Diagnostic test	Microscopic examination of CSF for Gram negative diplococci Culture and isolation of *N. meningitidis* from CSF
Specimen	Cerebral spinal fluid (CSF) Sample need to be preserved in TS medium **Note: CSF is the specimen of choice for culture and microscopic exam. If CSF notavailable, collect blood (10 ml adults, 1-5 ml for children) for culture.**
When to collect the specimen	Collect specimens from 5 to 10 cases once the alert or action (epidemic) threshold (see "Meningitis" in Section 8.0) has been reached.
How to prepare, store, and transport the specimen	▪ Prepare the patient and aseptically collect CSF into sterile test tubes with tops. ▪ Immediately place 1 ml of CSF into a pre-warmed bottle of trans-isolate medium. ▪ Incubate at body temperature (36C to 37C). ▪ Never refrigerate specimens that will be cultured. ▪ Keep CSF for microscopic exam and chemistry in cryovial and refrigerate send it tothe laboratory as soon as possible.
Results	▪ Isolation of *Neiserria meningitidis*, a fastidious organism, is expensive, and difficult. It requires excellent techniques for specimen collection and handling and expensivemedia and antisera. ▪ Initial specimens in an outbreak or for singly occurring isolates of *N. meningitis* should be serotyped and an antibiogram performed to ensure appropriate treatment. ▪ Trans Isolate medium (TI) is stable. If properly stored at temperature (4ºC) it canbe kept for up to two years after preparation. In the refrigerator, the liquid phase turns gelatinous but reliquifies at room temperature. Unused TI bottles should be kept tightly sealed. If there is any colour change (yellowing or clouding of the liquid medium) or drying or shrinkage of the agar slant, the medium should not beused.

Reference

- Weekly Epidemiological Record N 38, September 2000 (http://www.who.int/wer/pdf/2000/wer7538.pdf)
- WHO Regional Office for Africa Standard Operating Procedures for Enhanced Meningitis Surveillance

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in Africa, August 2009

- Control of epidemic meningococcal disease. WHO Practical Guidelines, 2nd Edition. WHO/EMC/BAC/98.3.
- "Laboratory Methods for the Diagnosis of Meningitis Caused by *Neisseria meningitidis, Streptococcus pneumoniae and Haemophilus influenzae.*" WHO document WHO/CDS/EDC/99.7 WHO, Geneva

METHANOL POISONING

Background

Methanol is a colourless volatile liquid, also referred to as methyl alcohol or wood alcohol is widelyused in commercial and industrial settings and can also be found in the home. Methanol is found as a component of many paint removers, varnishes, shellacs, windshield washing fluid and antifreeze. Methanol is derived as a by-product of wood distillation. Poisoning occurs with consumption of contaminated alcoholic spirits, accidental ingestion's, and suicide attempts. Methanol is rapidly absorbed from the gastric mucosa, and achieves a maximal concentration 30-90 minutes after ingestion. It is primarily metabolized in the liver via alcohol dehydrogenase into formaldehyde. Formaldehyde is subsequently metabolized via aldehyde dehydrogenase into formic acid, which ultimately is metabolizedto folic acid, carbon dioxide, and water.

Metabolism: Methanol → Formaldehyde → Formic acid → CO_2+H_2O

Methanol is primarily eliminated by liver through metabolism but a small percentage (2-5%) is renal excreted. Toxicity comes from the formation of formaldehyde and formic acid through hepatic dehydrogenases. The onsets of symptoms are associated with the accumulation of formic acid. Formate inhibits mitochondrial respiration leading to tissue hypoxia and lactate formation. Formate production occurs in the retina and leads to optic papillitis and retinal edema.

Further signs and symptoms may be shallow respiration, cyanosis, tachypnea, coma, seizures, electrolyte disturbances, and various hemodynamic changes including profound hypotension and cardiac arrest. There may be mild to profound loss of memory, confusion, and agitation, which may progress to stupor and coma as the severity of the acidosis increases.In severe cases, death is possible. Surviving patients can be left with permanent blindness or with other neurological deficits

In pure form, 10mls (2teaspoons) of methanol will cause blindness while 30mls is fatal.

A serum methanol concentration greater than 20 mg/dL soon after ingestion generally indicates the need for antidotal therapy. Initial symptoms may develop anywhere from 40 minutes to 72 hours afteringestion. The usual latent period is 12 to 18 hours. Co ingestion with alcohol may delay symptoms. Methanol poisoning can be treated with the antidotes ethanol or fomepizole. Both drugs act to reduce the action of alcohol dehydrogenase on methanol by means of competitive inhibition, so it is excreted by the kidneys rather than being transformed into toxic metabolites. Further treatment may include giving sodium bicarbonate for metabolic acidosis, and hemodialysis or hemodiafiltration can be used toremove methanol and formate from the blood folic acid is also administered to enhance themetabolism of formate.

Risk factor/s: Consumption of alcoholic beverages whose quality is not certified.

Surveillance goal

- Estimate and monitor incidence of methanol poisoning and related alcoholic impairments.
- Identify high risk areas and groups to inform prevention policy and programs

METHANOL POISONING

- Evaluate programmes aimed at preventing methanol poisoning
- Establish alert thresholds for fatalities to allow health facility personnel review care and servicesprovided to affected persons
- Establish incidence alert thresholds and monitor trends to enable sub-county/county health personnelinform relevant stakeholders

Standard case definition

Suspected case: Any person with alcohol intoxication with related symptoms of visual blurring, with orwithout blindness. **OR**

Any person dead or alive known to have taken an adulterated beverage together with other knownpersons.

Confirmed Case: A suspected case with laboratory confirmation.

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to relevant authorities.
- Manage and treat the case according to national guidelines.
- Conduct investigation to identify suspect alcoholic beverages which may be laced with methanoland other harmful compounds.
- Trace other people who may have shared the drink

Respond to action threshold

- Step up enforcement of measures to address risk factors
- Activate mass casualty management system

Analyze and interpret data

Time: Graph the number of cases by daily/weekly.**Place:** Plot the location of cases

Person: Count daily/weekly total cases and deaths for sporadic case incidents.

Analyze distribution of cases by locality and age groups and according to sources of the beverage.Assess risk factors to improve control of sporadic cases and incidences.

Laboratory confirmation

Diagnostic test	**Rapid procedure to detect methanol in blood (spot test):** Protein-free filtrate ofserum (1 mL) is added to 0.1 mL $KMnO_4$ solution (5 g in 100 mL H_2O). The test tube should be gently swirled and, after 5 minutes, sufficient powdered sodium bisulfite should be added to decolourise the permanganate. Freshly prepared chromotropic acid solution (0.2 mL, 0.5 g in 100 mL H_2O) and 6 mL concentrated H_2SO_4 should be added and mixed and heated in a boiling water bath for 5 minutes. A red-violet colour is positive and specific for methanol **Gas Chromatography** for quantifying methanol, ethanol and formic acid in both blood and urine.
Specimen	Blood and urine should be collected for methanol and formic acid determination.
When to collect the specimen	The specimen is collected as soon as the patient presents themselves or within 24 hours of methanol ingestion from live patients and during postmortem for deceased victims.
How to prepare,	Methanol and formate are stable in biological samples. Methanol, however, is a

store, and transport the specimen	volatile substance and samples should be stored in tightly capped containers. During all procedures, precautions should be taken to minimize the loss of alcoholsby evaporation. If prolonged storage before assay is necessary, it is advisable to keep the samples frozen at –20 °C ***Note no preservatives are added in blood and urine samples except anticoagulant.***
Results	Normal blood methanol concentrations derived from endogenous production anddietary sources are of the order of 15 mg/L (0.05 mmol/L) (range 2 to 30 mg/L) Urine normal formic acid concentrations average from 2 to 30 mg/L if determinedby the enzymic method (Shaller & Triebig, 1985), and from 2.1 to 289.2 mg/L if determined by gas-chromatography
Treatment	▪ ABC/Supportive care ▪ Gastric Lavage (in first few hours) ▪ Prevent methanol metabolism by ethanol and or Formepizole/Antizole Dosage:

Drug	Start dose	Maintenance dose
Oral 95% ethanol	1ml/kg	0.1-0.2mls/kg hourly
IV 10%ethanol in 50%dextrose	1-2mls/kg over 30mins	
Oral 40% ethanol	2.25mls/kg	0.25-4.5mls/kg hourly

Formepizole: 15mg/kg in 100mls D5W IV over 30mins and then 10mg/kg q 4hwith dialysis.

Reference

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- Brent J, McMartin K, Philips S, Aaron C, Kulig K: Fomepizole for the Treatment of Methanol Poisoning. N Engl J of Med 344; 424-429, 2001.
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- International Programme on Chemical Safety Poisons Information Monograph 335, Chemical
- Jacobsen D, McMartin KE: Antidotes for Methanol and Ethylene Glycol Poisoning. Clin Tox 35(2),127-143 (1997)
- Hanston P, Lambermont JY, Mahieu P: Methanol Poisoning During Late Pregnancy. Clin Tox 35(2);187-191 (1997)
- Monograph. Orphan Medical, Inc. Minnetonka, MN 1997
- Roy M, Bailey B, Chalut D, Senecal PE, Gaudreault P: What are the Adverse Effects of Ethanol usedas an Antidote in the Treatment of Suspected Methanol Poisoning in Children? Clin Tox 41(2); 155-161 (2003)
- Shaller KH, Triebig G (1985). Formate: determination with formate dehydrogenase. In: Bergmeyer, H.V. ed. Methods of enzymatic analysis, 3rd ed., vol. VI, Verlag Chemie, Weinheim.
- http://en.wikipedia.org/wiki/Methanol

NEONATAL DEATHS

Background

Almost 99% of newborn deaths occur in the developing countries where access to health care is low. Most of these newborns die at home, without skilled care that could greatly increase their chances for survival. Skilled health care during pregnancy, childbirth and in the postnatal (immediately following birth) period prevents complications for mother and newborn, and allows for early detection and management of problems. In addition, WHO and UNICEF now recommend home visits by a skilled health worker during a baby's first week of life to improve newborn survival. Newborns in special circumstances, such as low-birth-weight babies, babies born to HIV-positive mothers, or sick babies, require additional care and should be referred to a hospital.

Newborn deaths decreased from 4.6 million in 1990 to 3.3 million in 2009, but fell slightly faster since 2000. More investment into health care for women and children in the last decade when the United Nations Millennium Development Goals (MDGs) were set, contributed to more rapid progress for the survival of mothers (2.3% per year) and children under the age of five (2.1% per year) than for newborns (1.7% per year).

According to the new figures, newborn deaths, that is deaths in the first four weeks of life (neonatal period), in 2011, account for 41% of all child deaths before the age of five. That share grew from 37% in1990, and is likely to increase further. The first week of life is the riskiest week for newborns, and yet many countries are only just beginning postnatal care programmes to reach mothers and babies at this critical time.

Causes:

Newborn, or neonatal, deaths account for 37% of all deaths among children under five. Majority of all neonatal deaths (75%) occur during the first week of life, and of those deaths, 25% to 45% occur within the first 24 hours.

The main causes of newborn deaths are prematurity and low-birth-weight, infections, asphyxia (lack of oxygen at birth) and birth trauma. These causes account for nearly 80% of deaths in this age group.

Surveillance goal

- To contribute to Millenium Development Goal no. 4(i.e. reduction of neonatal deaths)
- Estimate and monitor neonatal mortality rates
- Identify risk factors and high risk areas for neonatal mortality to inform program decisions
- Evaluate programs aimed at reducing neonatal mortality

Standard case definition

Death of a liveborn infant within the first 28 days of life

Recommended public health action

- Establish alert thresholds to allow health facility or sub-county health personnel determine when specialtargeted interventions are necessary.
- Monitor trends and respond to alert thresholds
- Increase availability and use of antenatal care
- Provide specialized training to profession birth attendants
- Prompt treatment of newborn infections and educating on hygiene,warmth and exclusive infantbreastfeeding

Analyze and interpret data

Time: Graph deaths monthly. Target should reflect elimination target for each sub-county.

Place: Plot location of deaths.

NEONATAL DEATHS

Person: Count monthly deaths. Analyze each neonatal death .

Laboratory confirmation

Laboratory confirmation is not required.

Reference

- *Field manual for neonatal tetanus elimination*. Geneva, World Health Organization.WHO/V&B/99.14
- http://www.who.int/making_pregnancy_safer/topics/maternal_mortality/en/index.html
- http://www.unicef.org/index.php
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NEONATAL TETANUS

Background

- A neuromuscular toxin-mediated illness caused by the anaerobic spore-forming soil bacterium *Clostridium tetani*. The disease is transmitted when spores enter open wounds (injections, cuttingthe umbilical cord) or breaks in the skin.
- While tetanus may occur in adults, infection primarily affects newborns. Neonatal tetanus has decreased dramatically in countries with improved maternal tetanus immunization coverage. As a result, tetanus is targeted for elimination in many Kenya.
- Incubation period is 3 to 21 days, with an average of approximately 6 days.
- Risk factors: Unclean cord care practices during delivery for neonates. andack of antibodyprotection in who have received less than two doses of TT vaccine

Surveillance goal

- Target is each sub-county to report less than one case of NNT per 1000 live births
- Detect cases of neonatal tetanus immediately to confirm the case and prevent additional cases byimmunizing at least pregnant women in area around the confirmed case.
- Identify high risk areas and target tetanus toxoid campaigns to women of childbearing age.

Standard case definition

Suspected case: Any newborn with a normal ability to suck and cry during the first two days of life, and who, between the 3rd and 28th day of age, cannot suck normally, and becomes stiff or has convulsions or both.

Confirmed case: Same as for suspected case.

(Even though laboratory confirmation is possible, this will not be necessary within the current NNT surveillance needs).

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the next level.
- Conduct an investigation to determine the risk for transmission
- Treat and manage the case according to national recommendations, usually with supportive careand, if feasible, in intensive care. No routine isolation precautions are needed.

Respond to action threshold

NEONATAL TETANUS

If a case is confirmed through investigation:

- Immunize the mother and other pregnant women in the same locality as the case with at least 2doses of tetanus toxoid.
- Conduct a supplemental immunization activity for women of childbearing age in the locality.
- Improve routine vaccine coverage through EPI and maternal immunization program activities.
- Educate birth attendants and women of childbearing age on the need for clean cord cutting andcare. Increase the number of trained health workers

Analyze and interpret data

Time: Graph cases and deaths monthly. Target should reflect elimination target for each sub-county.

Place: Plot location of case households and location of birth attendants.

Person: Count monthly cases and deaths. Analyze each case of NNT by cord care practices.

Laboratory confirmation

Laboratory confirmation is not required.

Reference

- *Field manual for neonatal tetanus elimination*. Geneva, World Health Organization. WHO/V&B/99.14

NEWLY DIAGNOSED HIV INFECTION

Background

- HIV infection is caused by a retrovirus, human immunodeficiency virus (HIV). Sexual intercourse, needle injections, transfusions, trans-placental or trans-vaginal routes, breast milk or other direct contact with infected human body fluids transmits the virus from human to human.
- Twenty-four million Africans, close to one in ten adults between the ages of 15 and 49 years of age,are living with HIV/AIDS. The impact of the epidemic is already measurable in greatly increased adultand child morbidity and mortality. Incubation period is approximately 1 to 3 months from the timeof infection to the time that antibodies can be detected in a laboratory process. The time from HIV infection to the onset of AIDS is generally 7 to 9 years.
- Without treatment, HIV infection progresses to Acquired immunodeficiency syndrome (AIDS), which is characterised by failure of the immune system to resist other infectious diseases called opportunisticinfections (OI). These include tuberculosis, bacterial pneumonia or sepsis, oro-pharyngeal candidiasis,chronic diarrhoea, chronic skin infections, recurrent herpes zoster, and others.
- Risk factors: populations at high risk of acquiring HIV are commercial sex workers, men having sex with men, Injection drug userswith or without other sexually transmitted infections (STIs). STIs mayincrease the risk of HIV transmission and acquisition. In a generalised epidemic like Kenya everyonewho is sexually active is at a significant risk of acquiring HIV infection. .

Surveillance goal

- Quantify the burden of HIV/AIDS in the population
- Monitor the effectiveness of HIV prevention interventions
- Identify and link HIV infected persons to care and treatment

Standard case definition

Any person who tests positive based on the approved national HIV testing algorithm

Public health actions

NEWLY DIAGNOSED HIV INFECTION

- Screen for and treat STIs
- Promote and ensure the availability and use of condoms
- Conduct health Education on HIV and STIs
- Promote and conduct Voluntary Medical Male Circumcission
- Scale up provision of PMTCT interventions: Primary prevention, HIV Testing for Pregnant mothers,provision of ARV prophylaxis for both mothers and infants.
- Link those infected to HIV care and treatment programs

Analyze and interpret data

Time: Count newly diagnosed HIV cases and report monthly. At the end of the year, calculate the total number of cases and include trends from previous years. Relate this figure with the estimated PLHIV in the regions to determine case detection rate. Also relate this to the number of patients enrolled into HIVcare and treatment to assess referral effectiveness.

Laboratory confirmation

Diagnostic test	HIV infection is diagnosed based on the approved national testing algorithm, the current algorithm is serial testing using approved HIV antibody based rapid test kits for adults and DNA PCR for children less than two years.
Specimen	Whole blood for adults, Dry blood spots (DBS) for children <2 years
When to collect the specimen	Obtain specimens according to national HIV/AIDS program strategy for HIV testing. Children Less than 2 years will use DBS specimen which will be tested usingDNA PCR. Adults and older children; a needle prick is sufficient sample for HIV testing using the approved Rapid Kits
How to prepare, store, and transport the specimen	N/A for Rapid specimen. DBS: Spot three to five drops of whole blood on a standard filter paper. Leave it to dry for 16 hours or overnight. Package the driedsamples in glycine envelopes placed in ziplock bags with humidity indicators. Sendsample within a week to the central designated laboratory for testing.
Results	Strict confidentiality has to be observed in the management of HIV test results.

Reference

- *Guidelines for Sexually Transmitted Infections Surveillance*. Geneva. UNAIDS and World Health Organization. WHO/CDS/CSR/EDC/99.3. UNAIDS/99.33E
- WHO Case definitions of HIV for surveillance and revised clinical staging and immunologicalclassification of HIV-Related disease in adults and children.
- WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2
- Guidelines for Second Generation HIV Surveillance, WHO and UNAIDS, 2000 WHO/CDC/CSR/EDC/2000.5
- Consultation on technical and operational recommendations for clinical laboratory testingharmonization and standardization, Jan 2008, WHO, CDC

PLAGUE

Background

- Zoonotic systemic bacterial infection caused by *Yersinia pestis* (plague bacillus). Plague is a bacterialdisease (zoonotic) of rodents that can be spread to humans and other animals by infected fleas.
- Plague is endemic in many countries in Africa, in the former Soviet Union, the Americas and Asia
- In 2003, 9 countires reported 2118 cases and 182 deaths.98.7% of those cases and 98.9% of thosedeaths were reported from Africa.
- Plague has three forms: bubonic plague (infection of the lymph glands), septicemia plague (infectionof the blood), and pneumonic plague (infection of the lungs). Pneumonic plague can spread from person to person.
- People can get plague: by the bites of infected fleas; by direct contact with the tissues or body fluidsof a plague-infected animal; by inhaling infectious airborne droplets from persons or animals with plague pneumonia; or by laboratory exposure to plague bacteria.
- Plague is treatable with antibiotics if detected early.
- Prevention consists of controlling rodent fleas, educating the public and the medical community in places where plague occurs, and using preventive medicines and vaccines as appropriate.
- Incubation period is 1 to 7 days.
- Case fatality rate (CFR) may exceed 50-60% in untreated bubonic plague and approaches 100% in untreated pneumonic or septicaemic plague, but is usually <1% with appropriate treatment.
- Risk factor: rural residence, exposure to infected populations of wild or domesticated rodents and their fleas.

  Overcrowding, poor sanitation, high rodent population, Ocupation (vetenarians,wildlife)

Surveillance goal

- Detect outbreaks of plague promptly.
- Verify etiology of all suspected non-outbreak-related cases and the first 5 to 10 outbreak-related cases.
- Conduct investigation to identify animals and fleas species that are implicated in the plague enzoonotic cycle in the region and develop a programme for environmental management to limit itspotential spread
- Active long term surveillance of zoonotic foci and rapid response to reduce exposure during epizootic outbreaks

Standard case definition

Suspected case: Any person with sudden onset of fever, chills, headache, severe malaise, prostration and very painful swelling of lymph nodes, or cough with blood stained sputum, chest pain, and difficulty in breathing.

Confirmed case: Suspected case confirmed by isolation of *Yersinia pestis* from blood or aspiration ofbuboes,

Respond to alert threshold

If a single case is suspected:

- Report case based information to the next level immediately.
- Collect specimen for confirming the case.
- Investigate the case.
- Treat the patient with streptomycin, gentamicin or chloramphenicol, and administer chemoprophylaxis of close contacts with tetracycline for seven days from time of last exposure.

Respond to action threshold

PLAGUE

If the suspected case is confirmed:

- Isolate patients and contacts of pneumonic plague with precautions against airborne spread (wear masks, for example) until at least after 48 hours of appropriate antibiotic therapy.
- Mobilize community to enable rapid case detection and treatment, and to recognize mass rodent die-off as a sign of possible impending epidemic.
- Identify high risk population groups through person, place, and time analysis.
- Reduce sporadic and outbreak-related cases via improved control or rodent populations (remove trash, food sources, and rat harbourages) and protect against fleas with insect repellent on skin and clothing and environmental flea control (especially in homes and seaports and airports).

Analyze and interpret data

Time: Graph daily/weekly trends in cases and deaths. Construct epidemic curve for outbreak cases.**Place:** Plot the location of case households.

Person: Immediate case based reporting of cases and deaths for routine surveillance. Count daily/weekly cases and deaths for outbreaks. Analyze age distribution and assess risk factors to improvecontrol of sporadic disease and outbreaks.

Laboratory confirmation

Diagnostic test	Isolation of *Yersinia pestis* from bubo aspirate or from culture of blood, CSF orsputum. Identification of antibodies to the *Y. pestis* F1 antigen from serum.
Specimen	Aspirate of buboes, blood, CSF, sputum, tracheal washes or autopsy materials for culture Blood for serological tests
When to collect the specimen	▪ Collect specimen from the first suspected plague case. ▪ If more than one suspected case, collect specimen on 5 to 10 suspected cases ▪ Buboes: A small amount of sterile saline (1-2 ml) may be injected into the buboto obtain an adequate specimen ▪ Preferably, collect the specimen before the administration of antibiotics *If antibiotics have been started, plague can be confirmed by demonstrating seroconversion (4-fold or greater rise in titre) to the F1 antigen by passive haemaglutination using paired sera. Serum should be drawn within 5 days of onset then again after 2-3 weeks.*
How to prepare, store, and transport the specimen	▪ Specimens should be collected using aseptic techniques. Materials for culture should be sent to the laboratory in Cary Blair transport media or frozen (preferably with dry ice (frozen CO2). Unpreserved specimens should reach the laboratory the same day. ▪ Liquid specimens (aspirates) should be absorbed with a sterile cotton swab andplaced into Cary-Blair transport medium. Refrigerate. ▪ If transport will require 24 or more hours and Cary Blair transport is not available, freeze the specimen and transport it frozen with cool packs.
Results	Cultures should only be sent to a laboratory with known plague diagnostic capabilities or to a WHO Collaborating Centre for Plague. Plague culture results will take a minimum of 3 to 5 working days from receptionin the laboratory.

PLAGUE	
	Antibiotic treatment should be initiated before culture results are obtained. Plague patients seroconvert to the F1 *Y. pestis* antigen 7-10 days after onset.

Reference

- Plague Manual: Epidemiology, Distribution, Surveillance and Control/ Manuel de la Peste: Epidémiologie, Répartition, Surveillance et Lutte. WHO/CDS/CSR/EDC/99.2
- "Laboratory Manual of Plague Diagnostic tests." CDC/WHO publication, 2000, Atlanta, GA

POLIOMYELITIS (ACUTE FLACCID PARALYSIS)

Background

- Poliomyelitis is a paralytic disease caused by wild Poliovirus serotypes 1, 2, or 3. It istransmitted fromperson-to-person via faecal-oral route.
- Incubation period is 7 to 14 days for paralytic cases and the range is approximately 3 to 35 days. Thevirus may be shed for several years by immuno-compromised persons.
- Infection is usually asymptomatic, but may cause a febrile syndrome with or without meningitis. In less than 1% of infections there is an onset of an acute Acute Flaccid paralysis (AFP) that mostly affects the limbs.
- Polio infection occurs almost exclusively among children. Infection may occur with any of the 3 serotypes of Poliovirus. Immunity is serotype-specific and lifelong.
- Paralytic polio, though not fatal, has devastating social and economic consequences among affectedindividuals.
- The Polio Eradication Program has nearly halted ongoing wild-type polio transmission worldwide through use of oral poliovirus (OPV) vaccine. Globally, poliomyelitis caused by poliovirus type 2 has not been reported since 1999 and appears to have been eliminated. Serotypes 1 and 3 polioviruses still circulate in several African countries and surveillance is not yet adequate to assure eradication inmany countries.
- Areas with low vaccine coverage may allow ongoing wild-type transmission.
- Other neurological illnesses may present with similar signs and symptoms as poliomyelitis and may cause Acute Flaccid Paralysis, for example, Guillain-Barré syndrome and transverse myelitis.

Surveillance goal

- Detect cases of acute flaccid paralysis (AFP) and obtain laboratory confirmation of the etiology of allsuspected AFP cases.
- Timely case investigation (within 14 days of onset) of all AFP cases. Stool can be collected up to 30 days from the date of onset.
- Immediate case-based reporting of all AFP cases. Weekly summary reporting of cases for routine surveillance and outbreaks.
- Surveillance for AFP is used to capture all true cases of paralytic poliomyelitis. Target for surveillance performance to provide certification of polio eradications is 4 cases of AFP per year per 100 000 population aged less than 15 years (New surveillance performance target since 2011).

Standard case definition

Suspected case: Any child under 15 years of age with acute flaccid paralysis (not due to trauma) or anyperson with paralytic illness at any age in whom the clinician suspects poliomyelitis.

Confirmed case: A suspected case with virus isolation in stool.

Respond to alert threshold

If a single case is suspected:

- Report the suspected case immediately according to the national polio eradication program

guidelines.
- Conduct a case-based investigation. Include a vaccination history for the patient.
- Collect two stool specimens. Collect the first one when the case is investigated. Collect the second one from the same patient 24 to 48 hours later. See laboratory guidelines for information on how toprepare, store and transport the specimen.
- Obtain virological data from reference laboratory to confirm wild-type poliomyelitis or Vaccine derived poliomyelitis

Respond to action threshold

If a case is confirmed:
- Specimens from contacts with advice from DDSR
- If wild polio virus is isolated from stool specimen, refer to national polio eradication program guidelines for recommended response actions. The national level will decide which actions to take. They may include the following:
  - Immediately conduct "mop-up" vaccination campaign around the vicinity of the case.
  - Conduct active case search
  - Conduct surveys to identify areas of low OPV coverage during routine EPI activities, and improveroutine vaccine coverage of OPV and other EPI antigens.
  - Specify reasons for non-vaccination of each unvaccinated case and address the identified deficiencies.
  - Plan for supplemental vaccination campaigns during National Immunization Days (NIDs) or Sub-National Immunization Days (SNIDs). Focus supplemental vaccination activities in areas of low vaccine coverage during EPI. Consider use of house-to-house vaccination teams in selected areas.

Analyze and interpret data

Time: Graph monthly cases (which should be zero to very few cases per area per year), or weekly casesduring an outbreak. Evaluate the percent of suspected cases reported within 48 hours and the percentagewith adequate laboratory evaluation.

Place: Plot location of case households. Investigate the circumstances of poliovirus transmission in eachcase thoroughly. Examine the possibility of other potential areas of transmission.

Person: Count monthly routine and outbreak-related cases. Analyze age distribution. Assess risk factorsfor low vaccine coverage.

Laboratory confirmation

Diagnostic test	Isolation of polio virus from stool
Specimen	Stool ***Note:*** *If no specimen is collected, re-evaluate patient after 60 days to confirmclinical diagnosis of polio (AFP).*
When to collect the specimen	▪ Collect a sample from every suspected AFP case. ▪ Collect the first specimen when the case is investigated. ▪ Collect a second specimen on the same patient 24 to 48 hours later.
How to prepare, store, and transport the specimen	▪ Place stool in clean, leak-proof container and label clearly. ▪ Immediately place in refrigerator or cold box not used for storing vaccines or other medicines. ▪ Transport specimens under reverse cold chain to arrive at KEMRI polio laboratory within 72 hours of collection ▪ When there is a delay, and specimen will not be transported within 72 hours, freeze specimen at -20□C or colder. Then transport frozen specimen with dry ice or cold packs also frozen at -20□C or colder.
Results	Confirmed results are usually available within 21 after receipt of specimen by thelaboratory.

POLIOMYELITIS (ACUTE FLACCID PARALYSIS)

	If wild or vaccine derived polio virus is detected, DDSR will plan appropriate response actions

Reference

- *Field Guide for Supplementary Activities Aimed at Achieving Polio Eradication*. World Health Organization.
- WHO global action plan for laboratory containment of wild polio viruses. WHO/V&B/99.32, Geneva, 1999
- Manual for the virological investigation of polio,WHO/ EPI/GEN/97.01, Geneva, 2004
- Supplement to the Manual for the virological investigation of Polio- WHO/EPI 2007

RABIES AND ANIMAL BITES (DOGS)

Background

- Rabies is a zoonotic disease that is caused by a virus. Rabies infects domestic and wild animals, and isspread to people through close contact with infected saliva (via bites or scratches).
- The rabies virus infects the central nervous system, causing disease in the brain and, eventually, death. Early symptoms in people include: fever, headache, and general weakness or discomfort. Asthe disease progresses, symptoms include; insomnia, anxiety, confusion, slight or partial paralysis, excitation, hallucinations, increase in saliva, difficulty swallowing, and fear of water.
- In unvaccinated humans, rabies is almost always fatal if post-exposure prophylaxis is not administered before the onset of severe symptoms. Death usually occurs within days of the onset ofneurological symptoms.
- Dogs are the main carrier of rabies in Africa and are responsible for most (approximately 97%) of the human rabies deaths worldwide.
- WHO estimates approximately 55,000 human deaths worldwide due to rabies each year; in Africa the annual death toll is 24,000.
- People most at-risk of rabies live in rural areas, and children are at highest risk of dog rabies. About30% to 60% of the victims of dog bites (the primary mode of virus transmission) are children less than 15 years of age. Children often play with animals and are less likely to report bites or scratches.
- Control of rabies in dog populations and access to persons to post exposure prophylaxis can substantially reduce the burden of rabies in human populations
- Rapid and accurate laboratory diagnosis of rabies in humans and other animals is essential for timely administration of post-exposure prophylaxis. Within a few hours, a diagnostic laboratory can determine whether or not an animal is rabid and inform the responsible medical personnel.

Surveillance goal

- Detect and respond promptly and appropriately to cases and outbreaks of rabies do you want torespond to rabies or bites from suspected animals?.
- Identify high-risk areas
- Estimation of disease burden
- Immediate reporting of cases and routine monthly summary reports

Standard case definition

Suspected: A person reporting to a health facility with a history of having been bitten or been in contactwith saliva of an animal that is suspected to be rabid.

Probable: A person with one or more of the following: headache, neck pain, nausea, fever, fear of

water, anxiety, agitation, abnormal tingling sensations or pain at the wound site, when contact with a rabid animal is suspected.

Confirmed: A suspected case that is laboratory confirmed

Recommended Public Health Action

For a single case:

- Administer hyper-immune serum
- Post exposure prophylaxis to prevent rabies in **Suspected case**
- Vaccinate local dogs and cats to prevent outbreaks in liason with DVS---------- grammar

General preventive measures:

- Promote public awareness on rabies
- Target immunization campaign for domestic or wild animals in high-risk areas in liason with DVS
- Maintain active surveillance of rabies in animals in liason with DVS

Analyze and interpret data

Time: Plot cases monthly.

Place: Plot the location of case households and animal exposures.

Person: Analyze distribution of cases by age, exposing animal, and circumstances of infection. Assess riskfactors to improve control of cases

Laboratory confirmation

Diagnostic test	Detection of rabies viral antigens by direct fluorescent antibody (FA) in clinicalspecimens, preferably brain tissue (collected post mortem) ▪ Detection by FA on skin or corneal smear (collected ante mortem) ▪ FA positive after inoculation or brain tissue, saliva or CSF in cell culture, in miceor in suckling mice ▪ Detectable rabies-neutralizing antibody titre in the CSF of an unvaccinated person ▪ Identification of viral antigens by PCR on fixed tissue collected post motern or ina clinical specimen (brain tissue or skin, cornea or saliva) ▪ Isolation of rabies virus from clinical specimens and confirmation of rabies viralantigens by direct fluorescent antibody testing.
Specimen	▪ Brain tissue (collected post mortem) for both animals and humans ▪ Human skin biopsy (usually from the nape) ▪ Human cornea scripping ▪ Human or animal saliva ▪ Human CSF ▪ Head of suspected rabid animal (dogs)
When to collect the specimen	When a person is bitten by a pet that appears sick or by a wild animal, the biggest concern is rabies. No test can determine whether the rabies virus has beentransmitted to the person immediately after the bite. So the animal is evaluated to determine whether the person requires treatment. A wild animal that has bitten a person is killed if possible, so that its brain can be examined. If a person who has been bitten by an animal becomes increasingly confused and agitated or paralyzed, the diagnosis is probably rabies. At this point, tests can detect the rabies virus. Post mortem within 4-6hrs after death of patient, as soon as the suspected animal diesor is killed

RABIES AND ANIMAL BITES (DOGS)

How to prepare, store, and transport the specimen	Safety precautions in handling rabies virus should be taken to avoid infection. Remove the head of the suspected animal, wrap head completely such that no bloodis oozing out. Where possible, request a veterinarian to assist in the collection and preservation of the specimen. Sample should be sent to Reference Lab for Rabies virus identification.
Results	The treatment should never await the results of laboratory diagnosis. A laboratory diagnosis may be delayed for a variety of reasons. Results can be obtained from thereference lab within 1-2days.

Reference

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- Council of State and Territorial Epidemiologists (CSTE). National Surveillance for Human Rabies. CSTE position statement 09-ID-70. Atlanta: CSTE; June 2009. Available from: http://www.cste.org.
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RADIATION EXPOSURE

Background

- An accident is called a nuclear accident when it involves a nuclear facility, especially a nuclear reactor.
- A radiological accident involves a sealed or unsealed radiation source and leads to an uncontrolled release of ionizing radiation or radioactive materials into the environment.
- Such radiation sources include X ray equipment, sealed radioactive isotope sources (such as Cobalt-60, Cesium-137 or Iridium-192 irradiators) used mostly in medicine and industry, and unsealed sources used in nuclear medicine and scientific research.
- Potential accident types include the following:
  - A radioactive source may be misplaced, lost or stolen. An obvious example might be a gamma radiography source container and source found to be missing. One problem here is that the container may come into the possession of people who decide to dismantle or otherwise interfere with it, thereby exposing themselves and possibly others to an unshielded source.
  - A radioactive source may become unshielded as the result of a failure during routine operations.Again, gamma radiography provides an example: after making an exposure an operator may find it impossible to retract the source into its container.
  - A radioactive material may be dispersed. For example, a vial containing a radioactive solution might develop a leak during storage. Another example would be a violent release of radioactivesubstances from a radiochemical facility.
- In all these cases, there is a possibility of uncontrolled exposure of persons unless appropriate protective measures are taken.

RADIATION EXPOSURE

Surveillance goal

- To prevent accidents
- To prevent deterministic health effects (e.g. early deaths and injuries) by taking actions before or shortly after exposure and by keeping the public and emergency worker individual doses below the thresholds for deterministic health effects.
- To reduce the risk of stochastic health effects (e.g. cancer and severe hereditary effects) as much asreasonably achievable by implementing protective actions in accordance with International Atomic Energy Agency (IAEA) guidance

Standard case definition

Suspected case: Any person with burns of no known etiology or is suspicions about handling an 'object'that may be causing him to feel unwell

Confirmed cases: A suspected case with laboratory confirmation.

Respond to alert threshold

If an accident is suspected

- Prevent inadvertent ingestion of contamination (e.g., wear gloves, do not smoke or eat).
- Perform life saving measures and provide first aid for serious injuries immediately, before conducting radiological monitoring.
  - Keep people away from any potential source of exposure (at least 10 m from the public).
  - Arrange to transport seriously injured people to local medical facility. If they may becontaminated,
  - Wrap them in a blanket to control the spread of contamination. Tell those transporting the victim and the receiving medical facility that the person may be contaminated and thatthe risk to those treating such a patient is negligible but care should be taken to prevent inadvertent ingestion of contamination.
  - Identify and register potentially exposed/contaminated individuals, gather information that couldbe useful in reconstructing their dose to include medical symptoms and description of events.
  - Report to appropriate officials and obtain instructions
- Remain in the area until monitored.

Respond to action threshold

If an accident is confirmed

- Reassess and review, with allied departments and agencies, medium to long term protective actionssuch as food chain restrictions.
- Provide the population with information as to the likely health effects of the emergency by referenceto extant knowledge.
- Provide for detailed clinical and radiological review of affected persons.
- Establish a registry of persons to be tracked and to receive long-term medical follow-up.
- Base inclusion in the registry on objective criteria that indicate potential for an increase in theincidence of radiation induced cancer.
- Establish and maintain appropriate disease surveillance programme.
- Begin surveillance of any identified groups at-risk, e.g., screening for thyroid disease in children in anarea affected by radioactive iodine release.
- Assist Government authorities in planning a return to normal life for the population affected.
- Provide such specialized services as are needed to meet the demand for early recognition andtreatment of the stochastic consequences among affected people under a long term medical follow-

up programme.
- Make arrangements to promptly provide the public with the results of medical examinations.
- Arrange to provide useful, timely truthful, consistent and appropriate information to the publicregarding health consequences of the emergency. Use plain language explanation.

Maintain appropriate disease surveillance programme.

Analyze and interpret data

Time: Graph cases daily/weekly to analyze trends**Place:** Plot locations of household/industries

Person: Count weekly/daily cases and analyze demographic distribution

Laboratory confirmation

Diagnostic test	▪ Test for radiation **Required initial labs** ▪ Blood count with differential and repeat q 6h in order to evaluate lymphocytekinetics and to calculate the neutrophil/lymphocyte ratio. ▪ Serum amylase (baseline and qd after 24 h): A dose-dependent increase inamylase is expected after 24 h in the event of significant radiation exposure. **Important labs to obtain if feasible** ▪ Blood FLT-3 ligand levels – Marker for hematopoietic damage ▪ Blood citrulline – Decreasing citrulline indicates GI damage ▪ Interleukin-6 (IL-6) – Marker increased at higher radiation dose ▪ Quantitative G-CSF – Marker increased at higher radiation dose ▪ C-Reactive Protein (CRP) – Increases with dose; shows promise to discriminatebetween minimally and heavily exposed patients ▪ Cytogenetic studies with overdispersion index to evaluate for partial body exposure
Specimen	▪ Persons, material, tissues, atmosphere
When to collect the specimen	▪ When exposure situations suspected
How to prepare, store, and transport the specimen	
Results	General thresholds associated with various radiation dose thresholds ▪ Hematopoietic syndrome (> 1 Gy), ▪ GI syndrome (> 6-8 Gy), and Cardiovascular/CNS syndrome (> 20 Gy).

Reference

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RIFT VALLEY FEVER (RVF)

Background

- Rift Valley Fever (RVF) is a viral disease that affects mainly animals and occasionally humans. The virus is a member of the *Phlebovirus* genus, one of the five genera in the family *Bunyaviridae*. Thedisease is frequently reported following heavy rainfall and floods. It was first isolated in Rift Valley County of Kenya in 1930. The disease was reported in Kenya after the El Nino flooding of 1997/98 and more recently in 2006 to 2007. In 2007 and 2010, Tanzania and South Africa respectively were also affected. Other outbreaks have previously been reported in Somalia, Egypt, Saudi Arabia and Yemen.
- RVF is mainly transmitted from animals (sheep, cattle, goats, camels) to humans through close contact with infected animals (such as handling meat and body fluids and consumption of raw milk).During established RVF outbreaks in animals humans can also get infected through bites of infectedmosquitoes and other biting insects.
- The incubation period of RVF varies from 2 to 6 days. The clinical symptoms include an influenza- like illness, with sudden onset of fever, headache, myalgia and backache. These symptoms usually lastfrom 4 to 7 days. Most of the infected people recover on their own. However a small proportion (about 1%) get complications such as vomiting blood, nose bleeding and passing bloody stool. Othersevere types of the disease are eye disease and meningo-encephalitis.
- IgM antibodies typically appear from the fourth to sixth day after onset of symptoms
- Management of RVF in humans is mainly supportive as there is no definitive treatment for RVF. Earlydetection and management of the disease is important. Human control of RVF is through control of the disease in animals through a sustained vaccination program and limiting human-animal contact.Use of insecticide treated nets and mosquito repellants can also reduce infections in human. In addition to human suffering and death, RVF has far reaching economic implications to the Livestock
  industry. In outbreak settings, the disease manifestation includes non-hemorrhagic febrile syndromes,

RIFT VALLEY FEVER (RVF)

and laboratory testing should be considered among persons with milder symptoms suggestive of viralillness.

- Immediate Notification to WHO is formally required by IHR (Annex B in introduction)

Surveillance goal

Detect, confirm etiology and respond to outbreaks of all cases of suspected VHF promptly

Standard case definition

Suspected case:

Early disease:

- Acute febrile illness (axillary temperature >37.5 ºC or oral temperature of >38.0ºC) of more than 48hours 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 orabort, and where RVF virus activity is suspected/confirmed
- AND / OR:
  - Abrupt onset of any 1 or more of the following: exhaustion, backache, muscle pains, headache(often severe), discomfort when exposed to light, and nausea/vomiting **AND / OR**:
  - Nausea/vomiting, diarrhea OR abdominal pain with 1 or more of the following:
    - Severe pallor (or Hb < 8 gm/dL)
    - Low platelets (thrombocytopenia) as evidence by presence of small skin and mucous membrane hemorrhages (petechiae) (or platelet count < 100x109 / dL)
    - Evidence of kidney failure (edema, reduced urine output) (or creatinine > 150 mol/L) **AND /OR**:
    - Evidence of bleeding into skin, bleeding from puncture wounds, from mucous membranes ornose, 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, whoadditionally 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 hemorrhage, meningo-ecephalitis, or visual loss during the preceding month.

Confirmed case: Any patient who, after clinical screening, is positive for anti-RVF IgM ELISA antibodiesor tests positive on Reverse Transcriptase Polymerase Chain Reaction (RT-PCR).

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the appropriate levels.
- Enhance the usual standard precautions throughout the health care setting.
- Treat and manage the patient with supportive care.
- Collect specimen safely to confirm the case.

Respond to action threshold

If a single case is confirmed:

- Mobilize the community for early detection and care.

RIFT VALLEY FEVER (RVF)	
▪ Conduct community education about the confirmed case, how the disease is transmitted, and how toprevent contact with tissues of infected animals and avoid mosquito bites. ▪ Provide information about prevention in the home and when to seek care. ▪ Provide supportive treatment to all cases identified ▪ Request additional help from national levels as needed. ▪ Collaborate with the animal health specialists to search and document cases among animals as well.	
Analyze and interpret data	
Time: Graph cases and deaths monthly. Construct an epidemic curve during the outbreak.**Place:** Plot location of case households and work sites using precise mapping. **Person:** Immediate case-based reporting of cases and deaths. During the outbreak, count and report cases and deaths. Analyze age and sex distribution. Assess risk factors immediately and consider requestfor assistance to improve outbreak control.	
Laboratory confirmation	
Diagnostic test	Acute RVF can be diagnosed using several different methods. Serological tests suchas ELISA may confirm the presence of specific IgM antibodies to the virus. The virusitself may be detected in blood during the early phase of illness or in post-mortemtissue using a variety of techniques including, antigen detection tests by ELISA, RT-PCR, virus propagation (in cell cultures), Immunohistochemistry in formalin-fixed tissues. ELISA IgG can be used for retrospective diagnostic. Same test can be used for animal diagnosis
Specimen	ELISA (serology) ▪ Whole blood ▪ Serum or plasma ▪ Whole blood or clot ▪ Tissues (fresh frozen) RT-PCR – Virus isolation ▪ Blood ▪ Serum/plasma ▪ Liver biopsy from fatal cases Pathology ▪ Tissue biopsy from fatal cases Identical specimen can be collected from animal
When to collect the specimen	Collect specimen from the first suspected case. If more than one suspected case, collect until specimens have been collected from 5to 10 suspected cases.
How to prepare, store, and transport the specimen	Laboratory workers are at-risk. Samples taken from suspected human cases of RVFfor diagnosis should be handled by trained staff and processed in suitably equippedlaboratories. ELISA/PCR/ISOLATION ▪ Preparation and storage (freeze of refrigerate/as cold as possible) ▪ Shipping : frozen on dry ice or ice packs or both

RIFT VALLEY FEVER (RVF)	
	Note: if dry ice or ice packs are not available, sample may be shipped at roomtemperature and still provide valid results in most cases. **Immunohistochemistry:** ▪ Preparation and storage: Fix in formalin (can be stored up to 6 wks) ▪ Shipping: Room temperature (do not freeze). *Same shipping conditions for animal specimens*
Results	Diagnostic services for RVF are not routinely available. Advance arrangements areusually required for RVF diagnostic services. Contact the appropriate National authority or WHO. Contact national Veterinary Services for animal diagnostic
Reference	
▪ WHO/EMC Infection control for VHF in the African health care setting, WHO, 1998. ▪ WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2 ▪ Fact sheet Nº207 Revised September 2007. ▪ Infection Control for VHF in the African Health Care Setting /CDC (Annexes 11-12)	

SCHISTOSOMIASIS
Background
Schistosomiasis, commonly referred to as bilharzia,is a chronic diseases caused by a parasitic worm (blood fluke). That infests the blood veins of the urinary (venous plexus of bladder) and digestive sysyems (mesentric venules), and is endemic in developing countries mainly affecting irrigation, livestockfarmers, fishermen and people who use infested waters with the lavae (cercaria) for domestic use. It is the second most prevalent tropical parasitic disease (following malaria) and leading cause of severemorbidity for a long period of time in large parts of Africa, Asia and South America. It is reported by WHO, that 600 million people are at-risk, 250million are infected of whom 20 million are severely ill globally. There are 2 types of clinical disease: urinary schistosomiasis (S. haematobium) and intestinal schistosomiasis (S. mansoni, S. japonicum, S. intercalatum, S. mekongi). In Kenya the two major types of schistosomiasis are S.haematobia and S. mansoni. Approximately 6million are at-risk of infection Four endemic areas are recognized in the country. These include: Nyanza region; lower Eastern, partsof Central region and the Coastal region. Acute schistosomiasis is characterized by fever, headache, myalgia, and respiratory symptoms. Eosinophilia is present, as well as often painful hepato- and/or splenomegally. The clinical manifestations of chronic schistosomiasis are the result of host immune responses to schistosome eggs. Eggs secreted by adult worm pairs enter the circulation and lodge in organs and causegranulomatous reactions. Eosinophilia may be present. ***Schistosoma mansoni:*** Eggs most commonly lodge in the blood vessels of the liver or intestine and cancause diarrhea, constipation, and blood in the stool. Chronic inflammation can lead to bowel wall ulceration, hyperplasia, and polyposis and, with heavy infections, to periportal liver fibrosis and portal hypertension. ***Schistosoma haematobium:*** Eggs typically lodge in the urinary tract and can cause dysuria and

haematuria. Calcifications in the bladder may appear late in the disease. *S. haematobium* infection has been associated with increased risk of bladder cancer.

Surveillance goal

- To identify communities at high risk of the disease; assess infection levels according to geographicallocation and the need for treatment
- To provide baseline information to assess the impact of treatment during follow-up years
- To provide data on disease burden, drug susceptibility and risk factors associated with transmission

Standard case definition

Urinary schistosomiasis

Suspected: A person with visible haematuria **or** with positive reagent strip test for haematuria.
Confirmed: A person with eggs of S. *haematobium* in urine by microscopy.

Intestinal schistosomiasis

Suspected case: A person with chronic or recurrent intestinal symptoms (blood in stool, bloody diarrhea, diarrhea, abdominal pains) or, at a later stage, hepatosplenomegaly where malaria has beenruled out.

Confirmed: A person with eggs of S. *mansoni*, in stools by microscopy.

Recommended treatment strategies

WHO has developed guidelines for community treatment based on the impact the disease has on children in endemic areas.

- When a community reports greater than 50% children with blood in urine, everyone in the villagereceives treatment
- When 20-50% of children have bloody urine, only school age children are treated
- When less than 20% of children have symptoms mass treatment are not implemented but high-risk groups e.g. fishing community, irrigation community etc are examined and treated.

Analyze and interpret data

Place Map the distribution of schistosomiasis and identify implementation sub-counties or high riskcommunities that will require mass drug administration

Time: Monitor epidemiological trends over time of intervention

Person: Analyze the distribution of cases by age and other demographic factors

Laboratory confirmation

Diagnostic test	**Urine:** Microscopy demonstration of *S. haematobium* ova in urine and tissue by theurine filtration method. **Microhaematuria** detection by the chemical reagent strip **Stool:** Microscopy demonstration of *S. mansoni* ova in stool and tissue by the Kato-Katz method.
Specimen and when to collect	Mid-steam urine samples collected preferably between 10.00am to 2.00 pm Stool samples collected at any time of the day.
How to prepare, store, and transport the specimen	**Urine:** In a properly labeled screw cup universal bottles and keep upright at 2º to8ºC **Stool**: Collect 10 to 20 gms of stool in a clean dry poly pot and tightly close thecontainer. Keep at 2ºC to 8ºC.

SCHISTOSOMIASIS

Results	The microscopy results can be obtained within an hour from the time specimens are received in the laboratory.

Reference

- WHO 2010. Operational guide to mapping of schistosomiasis and soil transmitted helminthes.
- Geneva WHO 2006. Preventive chemotherapy in human helminthiasis.
- Brooker S., et al.. An updated atlas of human helminth infections: the example of East Africa. *International Journal of Health Geographics* 2009, **8**:42
- Fact sheet on schistosomiasis: www. WHO.int/mediacentre
- Schistosomiais: www. cdc.gov/parasites/Schistosomiasis

SEVERE ACUTE RESPIRATORY INFECTIONS (SARIS)

Background

- Severe acute respiratory infections (SARIs) are a significant cause of infectious disease morbidity andmortality in Africa. The mortality rates are particularly high among infants, children and the elderly.
- An improved understanding of the epidemiology and seasonality of SARIs in Africa is essential for optimizing public health strategies for their prevention and control (e.g., vaccines and antivirals forprophylaxis and treatment, infection control).
- The threat of SARIs due to novel organisms that have epidemic or pandemic potential warrants special precautions and preparedness. Respiratory disease events that may constitute a public healthemergency of international concern1 include severe acute respiratory syndrome (SARS); human influenza caused by a new subtype, including human episodes of avian influenza; pneumonic plague; and novel agents that can cause large-scale SARI outbreaks with high morbidity and mortality.

Surveillance goals

- To detect, in a timely manner, unusually severe morbidity and mortality caused by both known andunknown respiratory pathogens that have the potential for large scale epidemics or pandemics.
- To characterize and monitor trends in illnesses and deaths attributable to SARIs.

Standard case definition

Any patient presenting with an acute respiratory illness with onset during the previous 7 days requiringovernight hospitalization that includes:

- History of fever or measured fever of ≥ 38°C, AND
- Cough, **AND/OR**
- Shortness of breath or difficulty breathing

Severe acute respiratory infection (persons ≥ 5 years old)

Any severely ill person presenting with manifestations of acute lower respiratory infection with:

- Sudden onset of fever (>38ºC) AND
- Cough or sore throat AND
- Shortness of breath, or difficulty breathing
- With or without Clinical or radiographic findings of pneumonia

OR

Any person who died of an unexplained respiratory illness.

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Confirmed case of SARS: An individual who tests positive for SARS-CoV infection by the WHO recommended testing procedures.

Respond to a alert threshold

If a single case of an epidemic- or pandemic-prone acute respiratory disease is suspected. OR If there isan unusual event (deaths, outbreak) due to severe acute respiratory infection:

- Atypical severe acute respiratory infection (SARI).
- Two or more persons presenting with SARI or who died from a SARI are detected with onset of illness in a two-week period and from, the same geographical area and/or are epidemiologically linked.
- Health-care workers with occupational exposure risks develop SARI after providing care to patientswith SARI.
- Persons who have contact with dead birds/animals present with SARI;
- Any rumor of clusters of persons with severe acute respiratory disease

Respond to a suspected case of an epidemic- or pandemic-prone acute respiratory disease or to an usualevent of severe acute respiratory infections:

- Report case-based information immediately to the appropriate levels.
- Practice infection control precautions for an acute respiratory disease with epidemic/pandemic potential[4] (e.g., Standard plus Contact plus Droplet Precautions) immediately and enhance Standard infection prevention Precautions throughout the health care setting.
- Treat and manage the patient according to national guidelines.
- Collect and transport laboratory specimens from suspected case and from symptomatic contacts andarrange for laboratory testing [5,6].
- Review clinical history and exposure history during 7days prior to disease onset.
- Identify and follow-up close contacts of suspected patient.
- Conduct active searches for additional cases.

Analyze and interpret data

Time: Graph cases and deaths daily/weekly/monthly. Construct an epidemic curve during the outbreak

Person: Characterize the illness in terms of clinical presentation, the spectrum of disease, the proportionof cases requiring hospitalization, clinical outcomes, case fatality ratio, attack rates by age/occupation/blood relation.

Place: Describe risk factors, possible exposures. Ascertain whether any evidence exists that the virus may have increased its ability to cause human disease or improved its transmissibility.

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

References

- International Health Regulations, IHR (2005)
- AFRO Technical Guidelines for Integrated Disease Surveillance in the African Region, May 2002
- WHO guidelines for investigation of human cases of avian influenza A (H5N1), January 2007.
- WHO interim guidelines on infection prevention and control of epidemic- and pandemic-proneacute respiratory diseases in health care, June 2007
- WHO guidelines for the collection of human specimens for laboratory diagnosis of avian influenzainfection, 12 January 2005
- Collecting, preserving and shipping specimens for the diagnosis of avian influenza A (H5N1) virusinfection. Guide for field operations, October 2006.

SEVERE PNEUMONIA IN CHILDREN UNDER 5 YEARS OF AGE

Background

- Infection of the lower respiratory track caused by bacteria or viruses transmitted from person-to- person via aerosolized respiratory droplets. The main bacterial causes of pneumonia among childrenare *Streptococcus pneumoniae* (the pneumococcus) and *Haemophilus influenzae* type b (Hib).
- Acute respiratory infections (ARIs) and pneumonia represent the number one cause of mortality among children less than 5 years of age.
- Incubation period is usually less than 7 days, depending on the etiology.
- The Ministry of Health recommends the use of Integrated Management of Childhood Illness (IMCI) guidelines to reduce morbidity and mortality attributable to childhood pneumonia. Early antimicrobial therapy has been shown to reduce mortality.
- Resistance of the pneumococcus and Hib to beta-lactams (for example, ampicillin), sulfonamides (forexample, trimethoprim-sulfamethoxazole) and other antimicrobials is increasing.
- Viruses such as respiratory syncytial virus (RSV) may also cause ARI and pneumonia.

Surveillance goal

- Identify pneumonia cases and epidemics early using clinical definitions.
- Monitor antimicrobial resistance routinely and during outbreaks.
- Reduce the proportion of severe pneumonia cases compared to non-severe pneumonia cases tomonitor quality of interventions.

Standard case definition

Clinical case definition (IMCI) for pneumonia:

A child presenting with cough or difficult breathing and:

- 50 or more breaths per minute for infant age 2 months up to 1 year
- 40 or more breaths per minute for young child 1 year up to 5 years.

(Note: A young infant age 0 up to 2 months with cough and fast breathing is classified in IMCI as"serious bacterial infection" and is referred for further evaluation.)

Clinical case definition (IMCI) for severe pneumonia:

A child presenting with cough or difficult breathing and any general danger sign, or chest indrawing or stridor in a calm child. General danger signs for children 2 months to 5 years are: unable to drink or breast feed, vomits everything, convulsions, lethargy, or unconsciousness.

Confirmed case: Radiographic or laboratory confirmation of pneumonia will not be feasible in mostsub-counties.

Respond to alert threshold

If you observe that the number of cases or deaths is increasing over a period of time:

- Report the problem to the next level.
- Investigate the cause for the increase and identify the problem.
- Make sure that cases are managed according to IMCI guidelines.
- Treat cases appropriately with recommended antimicrobial drugs

Respond to action threshold

If the number of case or deaths increases to two times the number usually seen during a similar period inthe past:

- Assess health worker practices of IMCI guidelines for assessing, classifying and treating children withpneumonia and severe pneumonia.
- Identify high risk populations through analysis of person, place and time.

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- Conduct community education about when to seek care for pneumonia.

Analyze and interpret data

Time: Conduct month-to-month analysis for unexpected or unusual increases. Graph cases and deaths by month. Construct epidemic curve for outbreak cases. Plot month-to-month data and compare to previous periods.

Place: Plot location of case households.

Person: Count monthly pneumonia and severe pneumonia cases. Count pneumonia deaths. Analyze age distribution and vaccination status

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

- *Integrated Management of Childhood Illnesses*. World Health Organization. WHO/CDR/95.14.1

SEXUALLY TRANSMITTED INFECTIONS

Background

- Infections of the human genito-urinary and reproductive systems transmitted via human sexual contact (sexually transmitted disease, STIs). The most common causes of male urethral discharge are: a) the gonococcus *Neisseria gonorrhoea* and b) *Chlamydia trachomatis*. The most common causes of male and female genital ulcer are c) syphilis (*Treponema pallidum*), d) herpes simplex virus (HSV1 or2) and e) chancroid *(Haemophilus ducreyi*).
- STIs are endemic in most countries of the world, including countries in Africa. Multiple simultaneousSTIs are common (for example, gonorrhoea plus *Chlamydia*). STIs may be most highly prevalent inareas where HIV occurs and may facilitate HIV transmission or acquisition. STIs may be primary or from repeated attacks of urethral discharge.
- STIs are a leading cause of abortion and stillbirth, prematurity, and congenital infections. They maylead to pelvic inflammatory disease (PID), a major cause of decreased fertility.
- Incubation periods for gonorrhoea are 2 to 7 days; *Chlamydia* 7 to 14 days (or longer); syphilis, 10days to 12 weeks (usually around 3 weeks), and chancroid, 3 to 14 days.
- STIs may be more commonly diagnosed in men, in whom clinical evidence of infection may be morereadily apparent.

Surveillance goal

- Early detection and treatment of STI reduces transmission rates. Active efforts to diagnose latentsyphilis may prevent significant disability.
- Improve early and effective treatment of STIs using simple algorithms based on syndromic diagnosisfor index cases and partners.
- Carry out laboratory-based anti-microbial sensitivity monitoring and modify treatment guidelines accordingly at the national level.
- Compare surveillance data for both STIs and HIV/AIDS since STIs may reflect co-presence of HIV.

Standard case definition

Genital ulcer syndrome (non-vesicular):

Suspected case: Any male with an ulcer on the penis, scrotum, or rectum, with or without inguinal

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adenopathy, or any female with ulcer on labia, vagina, or rectum, with or without inguinal adenopathy.

Confirmed case: Any suspected case confirmed by a laboratory method. **Urethral discharge syndrome**:

Suspected case: Any male with urethral discharge with or without dysuria.

Confirmed case: *Urethral discharge syndrome*: A suspected case confirmed by a laboratory method (forexample Gram stain showing intracellular Gram-negative diplococci).

Public health action

- Conduct active case finding for specific target groups.
- Conduct partner tracing for complete treatment
- Screen all STI positive cases for HIV
- Conduct primary prevention activities such as promotion of safer sexual behaviours and provision ofcondoms.
- Assess use of algorithms for detection and treatment of STIs. And improve health worker practicewith algorithms.
- Include STI prevention and care services in maternal and child health, and family planning services.
- Target acceptable and effective STI prevention and care services to populations identified asvulnerable to STI transmission.
- Promote early STI health seeking behaviour.

Analyze and interpret data

Time: Graph cases each quarters , monitor for trends to inform public health action**Place:** No recommendation for analysis of place.

Person: Count quarterly cases and analyze age distribution.

Laboratory confirmation

Routine laboratory confirmation for surveillance is not required.

Reference

Guidelines for Sexually Transmitted Infections Surveillance. Geneva. UNAIDS and World Health Organization. WHO/CDS/CSR/EDC/99.3. UNAIDS/99.33E

SMALLPOX (VARIOLA)

Background

- Smallpox is an acute contagious disease caused by variola virus, a member of the orthopoxvirus family. Other members of the genus include cowpox, camelpox, and monkeypox. Monkeypox virushas caused the most serious recent human poxvirus infections.
- Smallpox killed as many as 30% of those infected. In 1967, when WHO launched an intensified planto eradicate smallpox, the disease threatened 60% of the world's population and killed every fourth patient.
- The global eradication of smallpox was certified by a commission of eminent scientists in December 1979 and subsequently endorsed by the World Health Assembly in 1980.
- Smallpox had two main forms: variola major and variola minor. The disease followed a milder course in variola minor, which had a case-fatality rate of less than 1 per cent. The fatality rate of variola major was around 30%. There are two rare forms of smallpox: hemorrhagic and malignant.

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In the former, invariably fatal, the rash was accompanied by hemorrhage into the mucous membranes and the skin. Malignant smallpox was characterized by lesions that did not develop to the pustular stage but remained soft and flat. It was almost invariably fatal.

- The incubation period of smallpox is usually 12–14 days (range 7–17) during which there is no evidence of viral shedding. During this period, the person looks and feels healthy and cannot infect others.
- The incubation period is followed by the sudden onset of influenza-like symptoms. Two to three dayslater, the temperature falls and the patient feels somewhat better, at which time the characteristic rashappears, first on the face, hands and forearms and then after a few days progressing to the trunk. Lesions also develop in the mucous membranes of the nose and mouth, and ulcerate very soon aftertheir formation, releasing large amounts of virus into the mouth and throat. The centrifugal distribution of lesions, more prominent on the face and extremities than on the trunk, is a distinctivediagnostic feature of smallpox and gives the trained eye cause to suspect the disease. Lesions progress from macules to papules to vesicles to pustules. All lesions in a given area progress together throughthese stages. From 8 to 14 days after the onset of symptoms, the pustules form scabs which leave depressed depigmented scars upon healing.
- Varicella (chickenpox) can be distinguished from smallpox by its much more superficial lesions, theirpresence more on the trunk than on the face and extremities, and by the development of successivecrops of lesions in the same area.
- Smallpox is transmitted from person to person by infected aerosols and air droplets spread in face-to-face contact with an infected person after fever has begun, especially if symptoms include coughing.The disease can also be transmitted by contaminated clothes and bedding, though the risk of infectionfrom this source is much lower.
- The frequency of infection is highest after face-to-face contact with a patient after fever has begun and during the first week of rash, when the virus is released via the respiratory tract.
- In the absence of immunity induced by vaccination, humans appear to be universally susceptible to infection with the smallpox virus.
- Vaccine administered up to 4 days after exposure to the virus, and before the rash appears, providesprotective immunity and can prevent infection or ameliorate the severity of the disease.
- Immediate Notification to WHO is formally required by IHR (2005).

Surveillance goal

- To detect and immediately respond to any suspected case of smallpox.

Standard case definition

Suspected case: An illness with acute onset of fever $\geq$ 38.3 °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.

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the appropriate levels.
- Implement airborne infection control precautions.
- Treat and manage the patient with supportive care.
- Collect specimen safely to confirm the case.

- Implement contact tracing and contact management.
- Conduct active surveillance to identify additional cases.
- Notify WHO.

Respond to action threshold

If a single case is confirmed:

- Maintain strict infection control measures practices throughout the duration of the outbreak.
- Mobilize the community for early detection and care.
- Conduct community education about the confirmed case, how the disease is transmitted, and how toimplement infection control in the home care setting and during funerals.
- Conduct active searches for additional cases.
- Request additional help from national and international levels.
- Establish isolation ward to handle additional cases that may be admitted to the health facility.

Analyze and interpret data

Time: Graph cases and deaths daily/weekly/monthly. Construct an epidemic curve.**Place**: Map location of case households.

Person: Immediate case-based reporting of cases and deaths. During the outbreak, count and report casesand deaths. Analyze age and sex distribution. Assess risk factors immediately.

Laboratory confirmation

Diagnostic test	Isolation of smallpox (Variola) virus from a clinical specimen**OR** Polymerase chain reaction (PCR) assay identification of Variola DNA in a clinicalspecimen **Note:** Level C or D laboratories only.
Specimen	Biopsy specimens* Scabs* Vesicular fluid* Lesion skin (roof)* Pustule material* Blood samples *Note: blood samples from person where severe, dense rash may be difficult to draw as the skin may slough off. A central line may be needed for access in cases where a peripheral blood draw is difficult.* * Preferred specimens for diagnosis of acute illness during rash phase
When to collect	A suspected case of smallpox is a public health and medical emergency. Collect samples from every suspected case at available times to achieve specimen types recommended.
How to prepare, store, and transport	Typical practices associated with collection of patient specimens are appropriate forcollection of orthopoxvirus lesions as well. These include wearing personal protective equipment, including gloves and sanitizing the site prior to collection. If alcohol isused to prepare the lesion for collection it is important to allow the lesion to dry

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	before it is collected. **Biopsy specimens:** Aseptically place two to four portions of tissue into a sterile, leak-proof, freezable container. Storage -20 °C to - 70 °C. Transport ~6h at 4 °C. *Note: package non-formalin lesion biopsy for shipping on dry ice, leave formalin fixed biopsy at room temperature. Do not freeze formalin fixed biopsy sample.* **Scabs:** Aseptically place scrapings/material into a sterile, leak-proof, freezablecontainer. Storage -20 °C to - 70 °C. Transport ~6h at 4 °C. **Vesicular fluid:** Collect fluid from separate lesions onto separate sterile swabs. Be sureto include cellular material from the base of each respective vesicule. Storage -20 °C to - 70 °C. Transport ~6h at 4 °C. **Blood:** Draw 10 cc of blood into a plastic marble-topped tube, or a plastic yellow-topped serum separator tube. ***Note:*** *approval must be obtained prior to the shipment of potential smallpox patient clinical specimens to a Reference laboratory.*
Results	Diagnostic services for smallpox are not routinely available. Advance arrangements areusually required for smallpox diagnostic services. Contact the appropriate National authority or WHO.

Reference

- WHO Fact Sheet, Smallpox. http://www.who.int/mediacentre/factsheets/smallpox

STROKE (CEREBROVASCULAR ACCIDENTS)

Background

A stroke, also known as a cerebrovascular accident (CVA), is the rapidly developing loss of brain function(s) due to disturbance in the blood supply to the brain. This can be due to ischemia (lack of blood flow) caused by blockage (thrombosis, arterial embolism), or a hemorrhage (leakage of blood). Asa result, the affected area of the brain is unable to function, which might result in an neurological deficitincluding inability to move one or more limbs on one side of the body, inability to understand or formulate speech, or an inability to see one side of the visual field.

A stroke is a medical emergency and can cause permanent neurological damage, complications, and death. Risk factors for stroke include old age, hypertension (high blood pressure), previous stroke or transient ischemic attack (TIA), diabetes, high cholesterol, cigarette smoking and atrial fibrillation. Highblood pressure is the most important modifiable risk factor of stroke.

Surveillance goal

- Estimation of disease burden and reduction of identified risk factors
- Monitor control and prevention activities
- Prevention of by early detection of risk factors
- Identification of high-risk groups and institution of preventive interventions
- Planning for the establishment of rehabilitation services
- Monitoring of prevention and control programs

Standard case definition

Suspected case: Any person presenting with sudden onset of temporary or permanent neurological

deficit

***Confirmed case*:** Any person presenting with sudden onset of temporary or permanent neurologicaldeficit with radiological evidence of brain hemorrhage or ischemia

Recommended public health action

- Health promotion for non-communicable diseases focusing on prevention of Stroke should be established, including community-based education on behavior change and adoption of healthy lifestyles
- Promote secondary prevention and treatment interventions at health facilities according to national guidelines.
- Tertiary Prevention Interventions (rehabilitation) should established

Analyze and interpret data

Time: Graph cases quarterly to analyze trends.

Place: Compare sub-county trends with national and regional trends.

Person: Analyze the distribution of cases by age and other demographic factors.

****Data for non-communicable diseases is often analyzed for long term trends***

Lab confirmation

The diagnosis of stroke is clinical.

Imaging techniques assist in determining the subtypes and cause of stroke.

Diagnostic test	CT Scan and MRI
Results	CT scanning of the head is typically used to detect infarction, tumours, calcifications, hemorrhage and bone trauma. Of the above, hypodense (dark) structures indicate infarction or tumours, hyperdense (bright) structures indicate calcifications and hemorrhage

Reference

- WHO, Atlas of heart disease and stroke, Geneva, World Health Organization, 2004.
- Prevention of recurrent Heart Attacks and Strokes in Low and Middle Income Populations, *Evidence –based recommendations for policy makers and health professionals*, WHO ,2003
- Non communicable Diseases: A strategy for the African Region, AFR/RC50/10
- Cardiovascular Diseases in the African Region: Current situation and perspectives, AFR/RC55/12
- http://www.who.int/chp/steps/en/
- http://www.afro.who.int/dnc/databases/afro_infobase/index.html
- WHO CVD-risk management package for low-and medium resource settings.
- "The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, andTreatment of High Blood Pressure" U.S. Department of health and Human Services, National Institutes of Health, National Heart, Lung, and Blood Institute, NIH Publication No. 03-5233, December 2003
- http://www.cdc.gov/stroke/

TRACHOMA

Background

- Trachoma is the leading cause of preventable blindness worldwide. It is caused by infection with *Chlamydia trachomatis* bacteria, and is both treatable and preventable.
- Infections often begin during infancy or childhood and can become chronic. If left untreated, the infection eventually causes the eyelid to turn inwards, which in turn causes the eyelashes to rub on the eyeball, resulting in intense pain and scarring of the front of the eye. This ultimately leads to irreversible blindness, typically between 30 and 40 years of age.
- Trachoma is easily spread through direct personal contact, shared towels and cloths, and flies that have come in contact with the eyes or nose of an infected person.
- WHO estimates that approximately 6 million cases of blindness due to trachoma and 11 million casesof trichiasis occur worldwide each year. Prevalence of active disease in children varies from 10-40%in some African countries.
- In Kenya the population at-risk is estimated at more than 2.2 million and people living with trichiasisis approximately 67,000. Five endemic sub-counties have been confirmed while suspected sub-counties are 39
- The infection primarily affects young children, with blindness occurring later in life. Females are three times more likely than males to suffer from trichiasis, the in-turning of the eyelashes that can lead toblindness. People are most at-risk for trachoma infection in areas where there is poor sanitation, lack of latrines, poor sources of clean water, and the presence of flies.
- Primary interventions advocated for preventing trachoma infection include improved sanitation, reduction of fly breeding sites and increased facial cleanliness (with clean water) among children at-risk of disease. The scaring and visual change for trachoma can be reversed by a simple surgical procedure performed at village level which reverses the in-turned eyelashes.

Surveillance goal

- Prevention of blindness by early detection
- Identification of high-risk areas and epidemiologic trends
- Estimation of disease burden
- Monitoring of control programs

Standard case definition

Suspected case: Any patient with red sticky eyes who complains of pain and itchiness of the eyes.

Confirmed case**:** Any patient with red sticky eyes who complains of pain and itchiness of the eyes whereexamination of the eyes confirms one of the stages of Trachoma infection according to the **WHO Simplified Trachoma Grading System**. (See reference below).

Recommended public health action

The World Health Organization has developed a series of interventions to control trachoma known bythe acronym SAFE: Surgery, Antibiotics, Facial cleanliness, and Environmental improvement.

Effective Trachoma control has four main components:

- Eye lid surgery for those at immediate risk of blindness
- Antibiotics to treat individual cases and to reduce infection in a community
- The promotion of facial cleanliness and hygiene to reduce transmission
- Environmental improvements such as provision of water and household sanitation

Analyze and interpret data

Time: Monitor epidemiologic trends over time.

Place: Plot the location of case households and analyze the distribution. **Person:**

Analyze the distribution of cases by age and other demographic factors.

TRACHOMA

Lab confirmation	
Routine laboratory confirmation for surveillance is not required.	
Diagnostic test	Detection of specific antigen. Nucleic acid tests and tissue culture techniques. Occasionally, in epithelial cells in Giemsa or iodine stained smears by direct microscopy.
Specimen	Collection of conjunctival scrapings
When to collect the specimen	
How to prepare, store, and transport the specimen	After anaesthetizing the conjunctiva with anesthetic eye drops, blot away any discharge and using a spatula with a thin blunt end, scrape the whole of the conjunctiva. Spread the specimen evenly on a slide. As soon as the preparation is air-dry, fix it with methanol for 2-3 minutes if the preparation is to be Giemsa stained.
Results	Outside of specialist laboratories, most ocular infection is diagnosed clinically (see **Annex 8** on the recommended case definition for the confirmed case) or immunologically.

Reference

- WHO Trachoma Page: http://www.who.int/topics/trachoma/en/
- World Health Organization. Trachoma control: A guide for program managers.
- Geneva: World Health Organization, 2006.
- World Health Organization. Achieving Community Support for Trachoma Control**.**
- Geneva: World Health Organization, 2006.
- World Health Organization. Primary Health Care Level Management of trachoma**.**
- Geneva: World Health Organization, 2006.
- World Health Organization. Trachoma epidemiologic survey protocol**.**
- Geneva: World Health Organization, 2006.
- CDC Trachoma: http://www.cdc.gov/healthywater/hygiene/disease/trachoma.html
- The Carter Center: http://www.cartercenter.org/health/trachoma/index.html

TUBERCULOSIS

Background

- Infection of the lungs and other organs usually caused by Mycobacterium tuberculosis transmitted person-to-person by droplet infection through coughing, sneezing or spitting. Clinically, the pulmonary form of the disease is more common than the extra-pulmonary form. The cardinal symptoms of pulmonary TB are chronic cough, weight loss, fever, loss of appetite and night sweats.
- Tuberculosis (TB) is a leading cause of infectious illness and death worldwide with over 8 million newcases and 3 million deaths per year. In African countries, approximately 1.6 million of the new casesand over 600 000 cases occur each year. It is also estimated that between 30 and 50% of all new TBcases detected are infected with HIV and 40% of all AIDS deaths are due to TB. Those who are at highest risk of dying from TB include people with HIV/AIDS, malnutrition and other immuno- compromising conditions, the very young, and the very old.
- The global HIV pandemic has been a major cause of increasing TB cases, especially in African countries.
- Incubation period is approximately 1 to 3 months.
- WHO recommends the Directly Observed Therapy, Short-course (DOTS) strategy to maximize compliance and treatment efficacy and to reduce development of drug-resistant strains. The DOTS strategy has been implemented by at least 40 of 46 Member States in the African Region. Varying degrees of success have been achieved in controlling TB where resources and motivation for diagnosis, treatment, and patient follow up are adequate.
- Clinically, bacterial pneumonia, malaria, trypanosomiasis, HIV/AIDS and a variety of other bacterial, parasitic, and viral infections may cause similar syndromes of fever, cough, fatigue, and weight loss,or may themselves precipitate active TB in an already infected individual. Abdominal or other extra- pulmonary sites of infection may occur after ingestion of un-pasteurized cow's milk *(M. bovis*).

Surveillance goal

- Early detection and treatment of persons with infectious lung disease to improve chances of clinical improvement and reduce transmission of TB.
- Improve percentage of TB cases confirmed by microscopy

Standard case definition

Suspected case: Any person with a cough of 2 weeks or more in addition to weight loss, fever and nightsweats

Confirmed case:

- *Smear-positive pulmonary* TB: a) a suspected patient with at least one smear specimen positive foracid-fast bacilli (AFB), or b) one sputum specimen positive for AFB by microscopy and radiographic abnormalities consistent with active PTB as determined by the treating medical officer, or c) one positive sputum smear by microscopy and one sputum specimen positive on culture for AFB.
- *Smear negative PTB*: a patient who fulfils all the following criteria: a) two sets taken at least 2 weeksapart of at least two sputum specimens negative for AFB on microscopy, radiographic abnormalitiesconsistent with PTB and a lack of clinical response despite one week of a broad spectrum antibiotic, adecision by a physician to treat with a full course of anti-TB chemotherapy, or b) a patient who fulfilsall the following criteria: severely ill, at least two sputum specimens negative for AFB by microscopy, radiographic abnormalities consistent with extensive pulmonary TB (interstitial and miliary), a decision by a physician to treat with a full course of anti-TB chemotherapy, or c) a patient whose initial sputum smears were negative, who had sputum sent for culture initially, and whose subsequentsputum culture result is positive.

Respond to alert threshold

TUBERCULOSIS

If you observe that the number of cases or deaths is increasing over a period of time:

- Report problem to the next level, or according to national guidelines.
- Treat individual cases with direct observation (DOTS) including a treatment supporter.
- Where feasible, isolate persons using respiratory infection control practices, especially if multi-drugresistant TB is suspected.
- Investigate cause of increase, including performance of DOTS program in your area.

Respond to action threshold

If the number of cases or deaths increases to two times the number usually seen in a similar period in thepast:

- Assess health worker performance with detection and treatment of smear-positive PTB and improvepractices as needed.
- Assess DOTS program and take action to make identified improvements.
- Conduct drug susceptibility tests to establish patterns of resistance.

Analyze and interpret data

Time: Graph cases and deaths monthly.

Place: Plot distribution of case households and workplaces.

Person: Count monthly cases and deaths. Analyze age and sex distribution quarterly.

Laboratory confirmation

Diagnostic test	Microscopy: Presence of Acid Fast Bacillus (AFB) in Ziehl Neelsen (ZN) stained smears Culture and identification Drug susceptibility test: Anti-tuberculosis drug resistance occurs when a strain of *Mycobacterium tuberculosis* isolate is resistant to one or more antimicrobial agents as evidenced by internationally recommended methods for susceptibility tests) MDR =Resistance to Isoniazid and Rifampicin; X-DR= Resistance to Isoniazid and Rifampicin (MDR); plus, additional resistance to a fluoroquinolone and a second-line injectable agent
Specimen	Deep-chest sputum Aspirates
When to collect the specimen	Collect sputum (not saliva) spot and morning for direct smear microscopy andexamine at least two stained specimens taken on different days.
How to prepare, store, and transport the specimen	Smear should be examined at health facility where the specimen is taken. In case long distance transportation is required e.g., for TB culture, specimen shouldbe placed in three containers, i.e.: ▪ A primary container which has the specimen and is leakproof with a screw-cap. ▪ A secondary container which is durable, waterproof and made of metal or plastic with a screw-cap. It should have enough absorptive material to absorb the contents of the primary container should the latter break or leak. On its outside, the details of the specimen should be pasted. ▪ A tertiary container is usually made of wood or cardbox. It should be capable of withstanding the shocks and trauma of transportation.

TUBERCULOSIS

Results	TB microscopy is read daily. Quantification of observed mycobacterium are reported using various reporting methods. Refer to the criteria used by the examining laboratory. Culture: after 6-8 weeks Anti-tuberculosis drug resistance: The national reference laboratory should be linked to a Supranational reference laboratory by strain exchange to ensure quality control

Reference

- Treatment of Tuberculosis: Guidelines for National Programs. WHO/TB/97.230
- Policy Statement of Prevention Therapy Against TB in People Living with HIV, WHO/TB/98.255
- Laboratory Services in Tuberculosis Control, Parts I, II and III. WHO publications WHO/TB/98.258
- Guidelines to surveillance of drug resistance in tuberculosis 4th ed. WHO/HTM/TB/2009.422

TYPHOID FEVER

Background

- Typhoid fever is a bacterial disease, caused by Salmonella typhi. Symptoms usually develop 1–3 weeks after exposure, and may be mild or severe. They include high fever, malaise, headache, constipation or diarrhea, rose-coloured spots on the chest, and enlarged spleen and liver. Healthy carrier state may follow acute illness.
- Typhoid fever remains a serious public health problem throughout the world, with an estimated 16– 33 million cases and 500 000 to 600 000 deaths annually. In the last outbreak in the Democratic Republic of Congo, between 27 September 2004 and early January 2005, no less than 42 564 cases of typhoid fever were reported, including 214 deaths and 696 cases of peritonitis and intestinal perforations.
- In virtually all endemic areas, the incidence of typhoid fever is highest among children and young adults 5–19 years). The disease is almost exclusively transmitted by food and water contaminated by the faeces and urine of patients and carriers
- Polluted water is the most common source of typhoid transmission. In addition, shellfish taken from sewage-contaminated beds, vegetables fertilized with night-soil and eaten raw, contaminated milk and milk products have been shown to be a source of infection.
- Typhoid fever has been virtually eliminated in most areas of the industrialized world with the advent of proper sanitary facilities. Most cases in developed countries are imported from endemic countries.
- People can transmit the disease as long as the bacteria remain in their body; most people are infectious prior to and during the first week of convalescence, but 10% of untreated patients will discharge bacteria for up to 3 months.
- Typhoid fever can be treated with antibiotics. However, resistance to common antimicrobials is widespread. Healthy carriers should be excluded from handling food.

Surveillance goal

- Detect Typhoid Fever sporadic cases and outbreaks promptly, and seek laboratory confirmation
- Identify areas/population at high risk in order to improve prevention of the disease by taking hygienic measures

Standard case definitions

TYPHOID FEVER

Suspected case: Any person with gradual onset of steadily increasing and then persistently high fever, chills, malaise, headache, sore throat, cough, and, sometimes, abdominal pain and constipation ordiarrhea.

Confirmed case: Suspected case confirmed by isolation of *Salmonella typhi* from blood, stool, urine andbone marrow, bowel fluid or stool.

Respond to alert threshold

If Typhoid fever cases are suspected:

- Arrange for laboratory testing of stool specimens or rectal swabs of suspected cases, especially insituations where food- or waterborne transmission is suspected.
- Report and investigate all suspected outbreaks of typhoid. Search for case/carrier that is the source ofinfection and for the vehicle (water or food) through which infection is being transmitted.
- Treat typhoid fever patients with antibiotics. Severe cases should be provided with supportive measures such as oral or intravenous hydration, the use of antipyretics, and appropriate nutrition.

Respond to action threshold

If Typhoid Fever cases are confirmed

- Identify areas/populations at high risk to identify source(s) and mode(s) of transmission in order to prevent and control the disease.
- Conduct health education programmes on hygiene with simple messages on safe water, safe food handling practices, hygiene and handwashing.
- Support provision of clean water and proper sanitation to affected population(s). Chlorinate suspected water supplies. All drinking water should be chlorinated or boiled before use.
- More than 90% of patients can be managed at home with oral antibiotics, reliable care and close medical follow-up for complications or failure to respond to therapy. Patients with persistent vomiting, severe diarrhea and abdominal distension may require hospitalization and parenteral antibiotic therapy.

Analyze and interpret data

Time: Graph cases and deaths weekly. Construct an epidemic curve during outbreaks. **Place:** Plot location of case households with precise mapping.

Person: Report immediate case-based information for cases and deaths. Report summary totals monthly. During outbreak, count cases and deaths weekly. Analyze by age. Assess risk factors to improve prevention of outbreaks.

Laboratory confirmation

Diagnostic test	Culture: Isolation of *salmonella spp.* from stool or blood or other tissue orsecretions of a patient is the gold standard. The WIDAL Test should not be used for diagnostic purpose
Specimen	▪ Blood, urine, bone marrow ▪ Stool
When to collect	Collected samples preferably before antibiotics are administrated
How to prepare, store, and transport	▪ 5-10 ml of blood distributed in a blood culture bottle. ▪ Stool in stool container ▪ Store specimens at 4-8 C or ambient temperature away from heat anddirect sunlight.

TYPHOID FEVER

Results	▪ Blood culture 4 days to 2 weeks ▪ Stool 3-4 days.

Reference

- The diagnosis, Treatment and Prevention of Typhoid Fever; WHO/V&B/03.07
- Weekly Epidemiological Record; N° 1, 2005, 80, 1-8; http//www.who.int/wer
- WHO Recommended Surveillance Standards WHO/CDS/CSR/ISR/99.2

VISCERAL LEISHMANIASIS

Background

Leishmaniasis is a disease that is caused by an intracellular protozoan parasite of the Genus Leishmania and transmitted by sandflies of the genus Phlebotomus. The disease occurs in three forms:

- Visceral leishmaniasis or kala-azar: Visceral leishmaniasis (VL) affects the reticulo-endothelial system i.e., liver, spleen and bone marrow and it is mainly caused by Leishmania donovani. The disease is usually fatal if not diagnosed and treated early.
- Cutaneous leishmaniasis: Cutaneous leishmaniasis (CL) manifests itself as nodular or open-lesionson the skin and it is caused by three distinct species of Leishmania which include - L. tropica, L. major and L. aethiopica. The disease usually starts as lesion at the site of inoculation. A crust develops centrally which may fall away exposing the ulcer which heals gradually, leaving a depressed scar with altered pigment
- Muco-cutaneous leishmaniasis.

Visceral leishmaniasis and Cutaneous leishmaniasis are the main forms in Kenya.

Globally, an estimated 500,000 cases of visceral leishmaniasis occur annually and over 90% of these cases come from six countries – Bangladesh, Brazil, Ethiopia, India, Nepal and Sudan. In Africa, visceralleishmaniasis is endemic in five countries namely Ethiopia, Kenya, Uganda, Somali and Sudan.

In Kenya it is estimated that about 4,000 cases occurs annually while 5 million people are at-risk of infection. Both visceral and cutaneous leishmaniasis are mainly found in the arid and semi-arid regions ofRift valley, Eastern provinces, North Eastern provinces and along the borders between Kenya and Uganda, Southern Sudan, Ethiopia and Somali.

Leishmaniasis is a poverty-related disease. It affects the poor and is associated with malnutrition, displacement, poor housing, illiteracy, gender discrimination, weakness of the immune system and lack ofresources. Leishmaniasis is also linked to environmental changes, such as deforestation, building of dams, new irrigation schemes and urbanization, and the accompanying migration of non-immune people to endemic areas.

Although its incidence is increasing, data for visceral leishmaniasis are scarce as there is no established effective surveillance system.

Surveillance goal

- To estimate burden of disease and establish populations at-risk
- To improve and focus the control activities
- To identify technical and operational difficulties
- To evaluate impact of control interventions
- To predict/anticipate epidemics

Aggregated data for reporting: Number of cases by age, sex, type of diagnosis.

Clinical description: An illness with prolonged irregular fever, splenomegaly and weight loss as its mainsymptoms.

VISCERAL LEISHMANIASIS

Standard case definition

Suspected case of Visceral leishmaniasis: Any person living or has traveled in an endemic area and complains of fever for more than two weeks, accompanied by abdominal swelling (splenomegally), general weight loss and in whom malaria has been ruled out or has not shown clinical response to effective anti-malarial drugs.

Suspected case of Cutaneuos leishmaniasis: Any person living in an endemic area who present with skinnodules or lesions that have lasted for more than two weeks.

Confirmed Case of Visceral leishmaniasis: A person who has fever of more than two weeks,splenomegaly and 'rK39' test is positive.

Confirmed Case of cutaneuos leishmaniasis: A person with skin nodules or lesion on the skin and amastigotes stage of the parasite has been confirmed in the tissue by microscopy.

Respond to alert threshold

If a single case is suspected:

If you observe that the number of suspected cases surpasses the normal threshold for that sub-county orclustering of cases over a short period:-

- Report the increase to the next level of the health system
- Reinforce the surveillance system
- Make weekly data reporting mandatory
- Treat all confirmed cases using appropriate drugs to minimize reservoir host
- Investigate the case to determine risk factors contributing to transmission
- Immediately start health education to the communities to-
  - Create awareness on leishmaniasis prevention and control measures
  - Use of personal prevention measure such as impregnated nets (LLINs)
  - Community members to volunteer for screening
  - To undertake vector control measures

Respond to action threshold

If a suspected epidemic is confirmed:

- Mobilize communities to enable rapid case detection and referral
- Identify high risk populations and target them for prevention measures
- Ensure the availability of essential supplies, including:
  - Drugs for treatment of leishmaniasis and for management of opportunistic infections invisceral leishmaniasis
  - Rapid diagnostic tests
  - Laboratory and parasitological diagnostic equipment
  - Surveillance and monitoring tools (including disease specific form)
- Train hospital and health centre staff in diagnosis and treatment algorithms and protocols and thebasic epidemiology of leishmaniasis
- Train community health workers in community sensitization and active case finding and referral,with a simplified case definition

Analyze and interpret data

Time: Graph cases and deaths.

Place: Plot location of case households. Incidence by geographical area**Person:** Count monthly cases and deaths.

Tables: Incidence by age, sex, type of diagnosis, risk group, by clinical features, by month/year.

NB. Data will be compiled on monthly basis. During outbreak periods data should be compiled andsubmitted weekly.

Laboratory confirmation

VISCERAL LEISHMANIASIS

Tests	**Visceral leishmaniasis:** ▪ Rapid dipstick 'rK39' test is the recommended serological diagnosis test for kala azar. Samples are collected from suspected cases using the case definition criteria. ▪ Splenic and bone marrow aspiration tests: These tests are considered as the "goldstandard" for the diagnosis of kala-azar. They are recommended in the following setting: o When 'rK39' test is negative but the suspicion of kala-zar is high o In kala-azar patients diagnosed by 'rK39' who do not respond to first-linetreatment o Patients with kala-azar/HIV co-infection o For quality assurance **Diagnostic test for Cutaneous leishmaniasis:** ▪ Slit-incision on the skin nodules or lesion edge, whereby exposed tissue and fluid are scraped onto a slide. Smears are prepared from the materials obtained and stained with Giemsa. Examination of the slide on a microscope will show presenceof amastigotes stage of the parasite, confirming the disease.
Specimen	**Rapid test:** One drop of blood drawn from a finger stick and placed in a test strips. **Splenic/bonemarrow aspirate:** The samples are collected by piecing the spleen or thebone marrow of the patient. The procedures are invasive with risky to the patient, andtherefore not recommended for routine use. Only trained personnel should carry out these tests in well-equipped hospitals. **Nodular tissue or secretions** examined under microscope slide
Results	**Rapid test:** The results are available within 20 minutes **Aspirate and incisional specimen:** Demonstration of amastigotes stage of the parasite on a microscope slide confirms the disease. Demonstration of amastigotes stage of theparasite on a microscope slide confirms the disease.

Reference

▪ Control of the Leishmaniasis: Technical Report series: 949. Report of a meeting of the WHO expertcommittee on the control of leishmaniasis, Geneva, 22-26 march 2010

YELLOW FEVER

Background

- Viral hemorrhagic disease caused by a flavivirus transmitted human-to-human via *Aedes* mosquitoes(urban epidemics) or via forest mosquito species and forest primate reservoirs (jungle cycle).
- Large scale outbreaks every 3 to 10 years in villages or cities. Sporadic cases can occur regularly in endemic areas. Resurgence of disease in Africa since mid-1980s. True incidence far exceeds reportedcases.
- Incubation period 3 to 6 days after the bite from an infected mosquito.
- While only the minority of cases are severe, case fatality rate may be 25% to 50% among patientswith syndrome of hemorrhage, jaundice, and renal disease.
- Risk factor: sporadic cases often linked to occupation or village location near woods or wheremonkeys are numerous. Also non-vaccinated persons.
- International reporting to WHO required within 24 hours.
- VHF and other infections causing hemorrhage may mimic yellow fever.

YELLOW FEVER

Surveillance goal

- Detect hemorrhagic fever cases and outbreaks promptly, and seek laboratory verification of the etiology of all cases of suspected yellow fever. (Other viral hemorrhagic fevers, dengue, anthrax, leptospirosis, rickettsial diseases, malaria, and other infectious agents and toxic exposures may causesimilar epidemics.)

Standard case definition

Suspected case: A person with acute onset of fever followed by jaundice within two weeks of onset offirst symptoms. Hemorrhagic manifestations and renal failure may occur.

Confirmed case: A suspected case with laboratory confirmation (positive IgM antibody or viral isolation) or epidemiologic link to confirmed cases or outbreaks.

Respond to alert threshold

If a single case is suspected:

- Report case-based information immediately to the next level.
- Treat and manage the patient with supportive care administered under a bednet (ORS, paracetamol for dehydration, fever) and strict isolation procedures.
- Collect specimen for laboratory confirmation.
- Investigate the case to determine how transmission occurred.
- Plan for an immunization activity.

Respond to action threshold

If a single case is confirmed:

- Mobilize community early to enable rapid case detection and treatment.
- Conduct a mass campaign in appropriate age group in the area (ages 6 months and older) and inareas with low vaccine coverage.
- Identify high risk population groups and take steps to reduce exposure to mosquitoes.
- Improve routine and mass vaccination campaigns to include yellow fever in high-risk areas.

Analyze and interpret data

Time: Graph cases and deaths monthly. During an outbreak, graph cases and deaths weekly. Construct anepidemic curve during outbreaks.

Place: Plot location of case households and occupation with precise mapping.

Person: Report immediate case-based information for cases and deaths. Report summary totals monthly. During outbreak, count cases and deaths weekly. Analyze by age. Assess risk factors to improve prevention of sporadic outbreaks.

Laboratory confirmation

Diagnostic test	ELISA for the presence of yellow fever IgM antibodies
Specimen	Serum
When to collect the specimen	Collect specimen from the first suspected case of yellow fever. If more than 1 suspected case, collect until specimens have been collected from 5 to 10 suspectedcases.
How to prepare, store, and transport the specimen	▪ Collect 10 ml of venous blood from adults, 1-5 ml from children. In a standardglass test tube, capillary tube or microtainer. ▪ Separate blood cells from serum: o Let clot retract for 30 to 60 minutes at room temperature. Centrifuge at

YELLOW FEVER	
	2000 rpm for 10-20 minutes and pour off serum into a clean glass tube. o If no centrifuge, put sample in refrigerator overnight (4 to 6 hours) until clotretracts. Pour off serum the next morning. o If no centrifuge and no refrigerator, let blood sit at an angle for at least 60 minutes (without shaking or being driven in a vehicle. Pour off serum into aclean tube. ▪ Store serum at 4°C. ▪ Transport serum samples using appropriate packaging to prevent breaking or leaks during transport
Results	The specimen should arrive at the laboratory within 3 days of being collected.Avoid shaking of specimen before serum has been collected. To prevent bacterial overgrowth, ensure that the serum is poured into a clean glasstest tube. The test tube does not need to be sterile – just clean. Transport the serum in an EPI hand vaccine carrier at 4EC-8EC to prevent bacterial overgrowth (up to 7 days). If not refrigerated, serum stored in a clean tube will begood for at least 3 days.
Reference	
▪ Sub-county guidelines for yellow fever surveillance. WHO 1998 WHO/GPVI/EPI/98.09 ▪ Yellow Fever. 1998. WHO/EPI/Gen/98.11	

b. ANNEXES TO SECTION 11

The following annexes are examples of program specific forms. Some forms are for documenting initial findings while others are designed for in-depth investigation. Refer to your country's national surveillance program for the appropriate forms.

ANNEX 11A AEFI - investigation form

ANNEX 11B Cholera - case-based investigation form

ANNEX 11C Kenya Guinea worm - investigation of rumour/suspected guinea worm case form

ANNEX 11D Guinea worm - case investigation form

ANNEX 11E Maternal death - reporting form

ANNEX 11F Tuberculosis - MDR and XDR TB - case-based reporting form

ANNEX 11G VHF - case investigation form

AEFI Investigation

An adverse event following immunization (AEFIs) is a medical incident that takes place after an immunization, causes concern and is believed to be caused by the immunization. Programmes providingimmunization services should include a system for AEFI detection and reporting, investigation and management, data analysis, corrective action, relevant communication and evaluation of the system. The ultimate goal of an investigation is to determine whether the vaccine or immunization process is responsible for the reported event(s) or to find another cause and correct it if possible, and reassure thepublic.

Further resources: http://www.who.int/immunization_safety/aefi/en/

http://www.who.int/immunization_safety/aefi/managing_AEFIs/en/index6.html

http://www.who.int/immunization/documents/792.pdf

1.	**Be prepared (Steps to take before an event occurs)** • Read the resource documents on reporting, management and investigation of AEFIs. • Develop standards: case definitions for reportable AEFIs, use of reporting forms and investigation procedures. • Designate and train staff to conduct an AEFI investigation using the investigation form. • Train staff on how to collect specimens. • Establish procedure, criteria and designated person for notifying WHO and UNICEF • (if UN- supplied vaccine) or other relevant party depending on procurement mechanism • Establish a National Technical Advisory Committee with representation from major medical organizations • Identify a spokesperson for public communications.
2.	**Receiving a report** • Ensure immediate reporting of most serious events and rapid attention to reports received • Verify the information in the report and classify and assess the AEFI using established casedefinitions. Decide whether it needs further investigating. • If investigation is warranted, travel to the location of the AEFI, or delegate responsibility toanother trained person
3.	**Investigate and collect data** • Ask about the patient • Ask about the vaccine and other drugs potentially received • Ask about other vaccinees • Ask about immunization services • Observe the service in action • Ask about cases in unvaccinated persons • Establish a more specific case definition if needed • Formulate a hypothesis as to what caused the AEFI **Collect specimens if appropriate:** • from the patient

	• the vaccine (and diluent if applicable) • the syringes and needles
4.	**Dispatch specimens** to appropriate testing facility (laboratory, regulatory authority, etc.)
5.	**Analyze the data** • Review epidemiological, clinical, and laboratory findings • Summarize and report findings
6.	**Take action** ☐ Communicate with health staff ☐ Communicate findings and action to the parents and public ☐ Correct problem (based on the cause) by improving training, supervision, and/or distribution of vaccines/injection equipment ☐ Replace vaccines if indicated

(To be used during cholera outbreaks)

Cholera Case Investigation Form		
Area : Patient and clinical laboratory related information		
	Variables/Questions	**Answers**
1	Detection day (ddmm/yyyy)	
2	Detection place (Health facility or Community)	
3	Patient identification number (yyyy-week-CCC-PPP-DDD-Reporting site-nnn)	
4	Patient surname or last name	
5	Patient first name(s)	
6	Age (years)	
7	Sex (F/M)	
8	Number of people in same household	
	Number of people in same household with cholera	
9	Patient's residential Address	
	Contact phone number	
10	Village/Town	
11	Neighborhood	
12	Sub-county	
13	County	
14	Country	
15	Date of onset (first symptoms) (ddmm/yyyy)	
16	Clinical signs and Symptoms	
17	Was patient exposed to any known risk factor for thisdisease? (Yes/No)	
18	If yes, specify risk factor(s): Water used by the patient for drinking : (list by type, e.g. tap water, Borehole, unprotected well, protected well, River, dum, lake, pond)	
19	Number of doses of cholera Vaccine	
20	Date last dose was administered	
21	Laboratory related information: at least first and lastcases	
22	*Vibrio cholerae* identified in stools?	
23	Drugs to which the vibrio strain is sensitive	
24	Drugs to which the vibrio strain is resistant	
25	Outcome (Died, Survived, Unknown)	

26	Final Classification (Not a case, Suspect, Probable, Confirmed by Lab, Confirmed by epidemiological link,Pending)	
27	Other Notes and Observations	
28	Date latest update of this record (dd/mm/yyyy)	
Area: Risk factor search (Information to be obtained from the water and sanitation group of theinvestigation team)		
	Variables/Questions	**Answers**
	Mapping Potential Hazards	
1	**Potential vibrio vehicles: drinking water**	
2	Drinking water source 1	
3	Drinking water source 2	
4	Drinking water source 3	
5	Drinking water source 4	
6	**Potential vibrio vehicles: non drinking water**	
7	Non drinking water source 1	
8	Non drinking water source 2	
9	Non drinking water source 3	
10	Non drinking water source 4	
11	**Potential vibrio vehicles: Food items**	
12	Food items 1	
13	Food items 2	
14	Food items 3	
15	Food items 4	
	Food items 5	
17	Food items 6	
18	Food items 7	
19	Food items 8	
20	**Bacteriology lab findings**	
21	Drinking water foundcontaminated by vibrio	
22	Non drinking water found contaminated by vibrio	
23	Food items found contaminated by vibrio	
24	**Looking out for Exposure to the identified hazards**	
25	Water used by the patient for drinking : (list by type, e.g.tap water, Borehole, unprotected well, protected well, River, dum, lake, pond):	
26	Within 3 days prior to the onset of the disease did thepatient drink from	
27	Water source 2 (Yes/No)	

28	Water source 3 (Yes/No)	
29	Water source 4 (Yes/No)	
30	Water source 5 (Yes/No)	
31	Within 3 days prior to the onset of the disease did the patient eat	
32	Food item 1 (Yes/No)	
33	Food item 2 (Yes/No)	
34	Food item 3 (Yes/No)	
35	Food item 4 (Yes/No)	
36	Food item 5 (Yes/No)	
	Travel to a high risk area	
37	Within 3 days prior to the onset of the disease did thepatient attend any	
38	Funerals (Yes/No)	
39	Other social event (Yes/No)	

GW F1

KENYA GUINEA WORM ERADICATION PROGRAMME
CASE INVESTIGATION FORM FOR GUINEA WORM DISEASE

Reporting Information

Village: Division: Sub-county:
Reporting Health Facility: Reporting Officer: Designation: Date:

Details of investigation

S/No	Patient Name	Age	Sex	Place of residence *(Leave this blank if the place of residence is the same as the place of reporting)*		Date rumour Reported	Reported By	Date Rumour Investigated	Investigated By	Outcome *(Confirmed GW case/ Pending/ Discarded)*	Date of Emergence of first GW	Cross Notification *(Done if Confirmed GW Case's place of reporting is different from place of residence)*	Epid No.
				Village	Sub-county								

*Serial number: This indicates the cumulative sequence of rumours reported since the beginning of the year.
** Epidemiological number: Is assigned by the county and is the link to the case in Form GWEP 3

Total number of rumours/suispected invesigated during the year: Total number of confirmed guinea worm case during the year:
Total number of confirmed guinea worm cases cross-notified:

Date Report Sent to Sub-county level: Date Rep[ort Received at the Sub-county Level:
Sent By: Received By:

KENYA GUINEA WORM ERADICATION PROGRAMME
CASE INVESTIGATION FORM FOR GUINEA WORM DISEASE

To be completed in triplicate **Epid No:**_ _ _-_ _ _-_ _ _-_ _-_ _ _ _

I. Reporting/Investigation Information

Reporting Village:_____ Sub-county:_____ County:_____

Date Case Reported: (dd/mm/yyyy)_____/___/_____ Reported by:_____ Position:_____

Date Case Investigated:_____/___/_____ Investigated by:_____ Position:_____

II. Patient Information and Place of Residence

Name:_____ Father's Name/Landlord's Name:_____

Age:_____ Sex:_____ Occupation:_____

Resident Address: Village:_____ Zone:_____

Area/Sub Sub-county:_____ Sub-county:_____ Region/County_____

Setting: Urban/Rural_____ Land Marks:_____

Phone number _____

Place of residence is same as the reporting village: YES/NO Residence since when(in months):_____

(Please fill BOX "III. Place stayed in the last 10-14 months …." if the number of months stayed in this box was less than 10.)

III. Place stayed in the last 10-14 months if not the same as above.

Village:_____ Zone:_____ Area/Sub Sub-county:_____

Sub-county:_____ Region:_____ Country:_____

IV. Travel History of patient in the last 10-14 months

Date From:	Date To:	Village:	Sub Sub-county	Sub-county:	Region:

Possible water sources that the patient might have contaminated with location details and GPS:if available

Name	Lattitude	Longitude	Type	Source	Check box if Treated with Abate and Date
					☐ _____
					☐ _____
					☐ _____
					☐ _____

V. Sign and symptom

What was the first sign/symptom before the emergence of worm? Blister/Itching/Swelling/Others, Specify_____

Emergence of guinea worm: YES/NO No of Worms:_____ Is this the first guinea worm emerged this year? YES/NO

KENYA GUINEA WORM ERADICATION PROGRAMME
CASE INVESTIGATION FORM FOR GUINEA WORM DISEASE

To be completed in triplicate **Epid No:**_ _ _-_ _ _ -_ _ _-_ _-_ _ _ _

Date of the First guinea worm emerged:_____/___/_____Was the case detected before worm emerged? YES/NO

VII. Case Containment Measures and Guinea-worm registry

Received any health education: YES/NO Patient entered any water source: YES/NO

Place Managed: CCC/Home/Health Centers/Hospital

Name of Health Facility/Health Center/Other Centers if patient was hospitalized:____ Admission Date:

_____/____/_____` Discharged Date:_____/____/_____

SN.NO.	Location of worm	Date worm detected	Date guinea-worm Extracted/emerged	Date confirmed by supervisor:	Date guinea-worm completely expelled
_____	_____	___/____/_____	___/____/_____	___/____/_____	___/____/_____
_____	_____	___/____/_____	___/____/_____	___/____/_____	___/____/_____
_____	_____	___/____/_____	___/____/_____	___/____/_____	___/____/_____
_____	_____	___/____/_____	___/____/_____	___/____/_____	___/____/_____
_____	_____	___/____/_____	___/____/_____	___/____/_____	___/____/_____
_____	_____	___/____/_____	___/____/_____	___/____/_____	___/____/_____
	_____	___/____/_____	___/____/_____	___/____/_____	___/____/_____
_____					

VIII. Specimen Handling

Was a specimen (worm) saved and preserved in alcohol? YES/NO If NO WHY?

Date sent to Region:_____Received By:_____Date Received:_____

Date sent to National:_____Received By:_____Date Received:_____

For National Secretariat Only:

Did you send it for confirmation? Yes/No Date sent:_____Sent To:_____

Date Result Received_____

Result:

IX. Other Information

Use of cloth filter: YES/NO Frequency of changing filters 1-rarely; 2-sometimes; 3-always; 4-never

Remarks:_____

Person who completed this form:

_____ _____ _____ _____

NAME POSITION CELL PHONE NO SIGNATURE

c. Maternal Death Notification (MDN) Form CONFIDENTIAL *MOPHS*

For official use only						MDN Form number						

INSTRUCTIONS

1. ***This form must be completed for all deaths, including abortions and ectopic gestation related deaths, in pregnant women or within 42 days after termination of pregnancy irrespective of duration or site of pregnancy***
2. ***Mark with a tick where applicable***
3. ***The MDN form to be filled by the most Senior Health Worker at that level, in consultation with immediate care givers***
4. ***The forms should be filled in 4 copies; the original remains in the facility, one copy sent to the Sub-county MD Committee, the Provincial MD committee and theNational MD Committee***
5. ***The form should be filled immediately after the occurrence of death (within 24 hours)***
6. ***These confidential forms should be in the custody of the Nursing Officer i/c and the Secretaries of the MDR committees***
7. ***The form should have no names, or any other identification details of the deceased***
8. ***For Coding purposes: 1=community/home, 2=dispensary, 3=Health Centre, 4=Sub-sub-county/ Sub-county hospital, 5=Provincial, 6=National/Teaching***

1. Locality where death occurred

Province		Sub-county		Level of care code ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6
Managing authority ☐ Public ☐ NGO/FBO ☐ Private ☐ Other, specify				

2. Details of deceased

Age yrs ☐☐	Citizenship	Para	+☐ ☐	Gravida	☐☐	Gestation (weeks) (or at delivery)	☐☐	Days since delivery/abortion	☐☐

3. Details of Admission (where death occurred)

Date of admission:							Time of admission:	Date of death:						Time of death:
Main reason for admission:							Referral from another centre?yes ☐ ☐ no ☐ unknown		If "Y" from:					Level of care code ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6
Stage of pregnancy on admission:							☐ Ectopic pregnancy ☐ Aborting ☐ Antepartum ☐ Intrapartum ☐ Puerperium							
Condition on admission:							☐ Stable ☐ Critically ill ☐ Dead on arrival ☐ Other, specify							

Stage of pregnancy at moment of death:	☐ Abortion ☐ Ectopic pregnancy ☐ Antepartum ☐ Intrapartum ☐ Puerperium

4. Antenatal and Delivery Care

Did she receive antenatal care? ☐ yes ☐ no ☐ unknown	If "Y"	Level of care code ☐1 ☐2 ☐3 ☐4 ☐5 ☐6	No. of visits ☐1 ☐2 ☐3 ☐4 ☐>4
Did she receive any Emergency Obstetrics Care? ☐ yes ☐ no ☐ unknown	If "Y"	Level of care code ☐2 ☐3 ☐4 ☐5 ☐6	
Delivery ☐ yes ☐ no	If "Y"	☐ SVD-skilled ☐ SVD-unskilled ☐ Vacuum ☐ CS ☐ Destructive operation ☐ Other, specify	
Baby outcome, tick	☐ Alive ☐ Fresh stillbirth ☐ Macerated stillbirth ☐ Neonatal Death		

5. Cause of death

Direct cause ☐ yes ☐ no	If "Y"	☐ Hemorrhage ☐ Infection ☐ Eclampsia ☐ Obstructed labour ☐ Abortion
Indirect cause ☐ yes ☐ no	If "Y"	☐ Malaria ☐ Anaemia ☐ HIV/AIDS ☐ Cardiovascular ☐ Other specify

6. In your opinion were any of these factors present

System	Factors
Personal / family (1st delay)	☐ Failure to recognise danger signs ☐ Ignorance of available services ☐ Delay in woman seeking help ☐ Cultural / religious reasons / objections Poverty ☐ High cost of treatment ☐ Other, specify
Access to skilled attendance (2nd delay)	☐ Lack of communication / transport from home to health care facility ☐ Lack of communication / transport between health care facilities ☐ Long distances / poor roads ☐ Refusal of treatment or admission ☐ Other, specify
Quality of care (3rd delay)	☐ Lack of skilled human resources ☐ Poor attitude ☐ Low morale ☐ Poor interpersonal relationship ☐ Lack of expertise ☐ Lack of skills ☐ Lack of blood for transfusion ☐ Lack of emergency/essential drugs (e.g. antibiotics, oxytocics, anticonvulsants, iv fluids) Lack of equipment or supplies ☐ Inappropriate/delayed interventions ☐ Other, specify

Case based Multi-Drug Resistant and Extensively Drug Resistant Tuberculosis Report Form

County:	**Year:**	
Quarter:	**Month:**	**Drug Susceptibility Test Results (S=sensitive; R=Resistant; I=intermediate; U=unknown)**

*** Multi-drug Resistant TB =** Resistance to at least Isoniazid and Rifampicin

****Extensively Drug Resistant TB =** MDR-TB plus: Resistance to any fluoroquinolone such as Ciprofloxacin, Oxfloxacin, etc, andResistance to at least one of the three second line injectable anti-TB drugs (Capreomycin, Kanamycin and Amikacin).

First-line drugs: H = Isoniazid R = Rifampicin E = Ethambutol Z = Pyrazinamide S = Streptomycin Th = Thioacetazone

Second-line drugs: Am=Amikacin Km=Kanamycin Cm=Capreomycin Cfx=Ciprofloxacin Ofx=Ofloxacin Lfx=LevofloxacinMfx=Moxifloxacin Gfx=Gatifloxacin Pto=Protionamide Eto=Ethionamide Cs=Cycloserine PAS=P-aminosalicylic acid

ID Case

Date of reception:___/___/___

Date of detection of the case ___/___/___

This Case was notified by *(tick off the right answer and specified)*

ϒ Mobile team, #_____ □ Health Centre _____

ϒ Hospital _____ □ Others: _____

Form filled by (first name and surname) _____

Information given by (first name and surname)_____

Family link with the patient _____

Identity of the patient

First name:_____Surname_____

Nickname _____

For the babies, son/daughter of (name of father) _____

Birth date:____/___/____Age (years)_____Sex □ M □ F

Permanent address: Head of Household (first name and surname) _____

Village/Suburb_____ Country_____GPS lat_____long _____

Nationality:_____Ethnic group _____

Profession of the patient *(tick off the right answer)*

ϒ Miner □ House wife □ Hunter/trading game meat □ Children

ϒ Pupil/ Student □ Farmers □ Health staff, details: Name of health care facility_____

Service_____qualification _____

ϒ Others _____

Status of the patient

Status of the patient at detection □ Alive □ Death

If dead, please specify date of death:_____/___/____

Place of death: □ Community, name village_____Country_____

□ Hospital, name and service_____ Country _____

Place of the funerals, name village: _____ Country_____

History of the disease

Date of onset of symptoms:__/_____/____

Name of the village where the patient got ill _____ Country_____

Did the patient travel during illness : □ Yes □ No □ DNK

If Yes, indicate the places and the country:

Village_____ Health Centers_____Country_____

Village _____ Health Centers_____Country_____

Did the patient have fever**?** □ Yes □ No □ DNK. If yes, date of onset for the fever:_____/___/____

Does or did the patient have the following symptoms (*tick off when apply)*

Headache:	□ Yes	□ No	□ DNK	Skin Rash	□ Yes	□ No	□ DNK
Vomiting/Nausea	□ Yes	□ No	□ DNK	Bleeding from injection sites	□ Yes	□ No	□ DNK
Anorexia/Loss of Appetite	□ Yes	□ No	□ DNK	Bleeding gums	□ Yes	□ No	□ DNK
Diarrhea	□ Yes	□ No	□ DNK	Bleeding into eyes (red eyes)	□ Yes	□ No	□ DNK
Intense Fatigue	□ Yes	□ No	□ DNK	Black or bloody stool	□ Yes	□ No	□ DNK
Abdominal Pain	□ Yes	□ No	□ DNK	Blood in vomits	□ Yes	□ No	□ DNK
Muscle or Joint Pain	□ Yes	□ No	□ DNK	Bleeding from nose	□ Yes	□ No	□ DNK
Difficulty swallowing	□ Yes	□ No	□ DNK	Bleeding from vagina	□ Yes	□ No	□ DNK
Difficulty breathing	□ Yes	□ No	□ DNK	Hiccoughs	□ Yes	□ No	□ DNK

d. Exposition Risks

- Was the patient hospitalized or did he visit anyone in the **hospital** anytime in the three weeks beforebecoming ill? □ Yes □ No □ DNK; If Yes, where_____between (dates)_____/___/___ and__/_____/___
- Did the patient have visit/consult a **traditional healer** during the three weeks before becoming ill orduring illness? □ Yes □ No □ DNK; If Yes, name of the traditional healer _Village_____Country_____;

  When and where did the contact take place? Place_____date:__/_____/_____
- Did the patient receive traditional medicine? □ Yes □ No □ DNK; If Yes, explain which kind:

_____

- Did the patient attend **funeral ceremonies** during anytime in the three weeks before becoming ill? □ Yes □ No □ DNK;
- Did the patient **travel** anytime in the three weeks before becoming ill? □ Yes □ No □ DNK If Yes, where_____between (dates)_____/___/____and____/___/____
- Did the patient have a contact with a **known suspect case** anytime in the three weeks before becomingill? □ Yes □ No □ DNK; If Yes, Surname_____First name _____ ID Case
- During the contact, the suspect case was □ Alive □ Dead date of death_____/___/____

  Date of last contact with the suspect case ___/___/____
- Did the patient have contact with a **wild animal** (non-human primate or others), that was found deador sick in the bush, or animal behaving abnormally anytime in the three weeks before the illness?

  □ Yes□ No □ DNK; If Yes, kind of animal_____Location_____date____/___/____

Has a sample been collected? □ Yes □ No □ DNK; If yes, date_/_____/___

ϒ Blood sampling □ Urine □ Saliva □ Skin Biopsy

Was the patient sent to a hospital? □ Yes □ No

Was the patient admitted in the isolation ward? □ Yes □ No

If Yes, name of Hospital_____No. de hospital_____Hospitalization date_____/___/

Update on the Hospital information ID Case: _____

Reception date:_____/___/___Country:_____Member of family helping the patient:

_____Name and Surname_____Date of discharge_____/___/___OR Date of death____/___/____

e. Laboratory

A specimen was collected before the death After the death

Date sample_____/___/____ Date results_____/___/____ ID Lab _____

Sample □ blood □ blood with anti-coagulants □ skin biopsy □ cardiac function □ other:

_____

Results PCR □ pos □ neg □ NA date__/__/

Antigen detection □ pos □ neg □ NA date__/__/

Antibodies IgM □ pos □ neg □ NA date_/_/

Antibodies IgG □ pos □ neg □ NA date__/__/

ImmunoHistochemistry □ pos □ neg □ NA date_/_/

Outcome *(verified 4 weeks after the onset of symptoms)*

ϒ Alive □ Dead; If dead, date of death_____/___/____

CASE CLASSIFICATION

□ Alert Case □ Suspect □ Probable □ Confirmed □ Not a case



World Health Organization