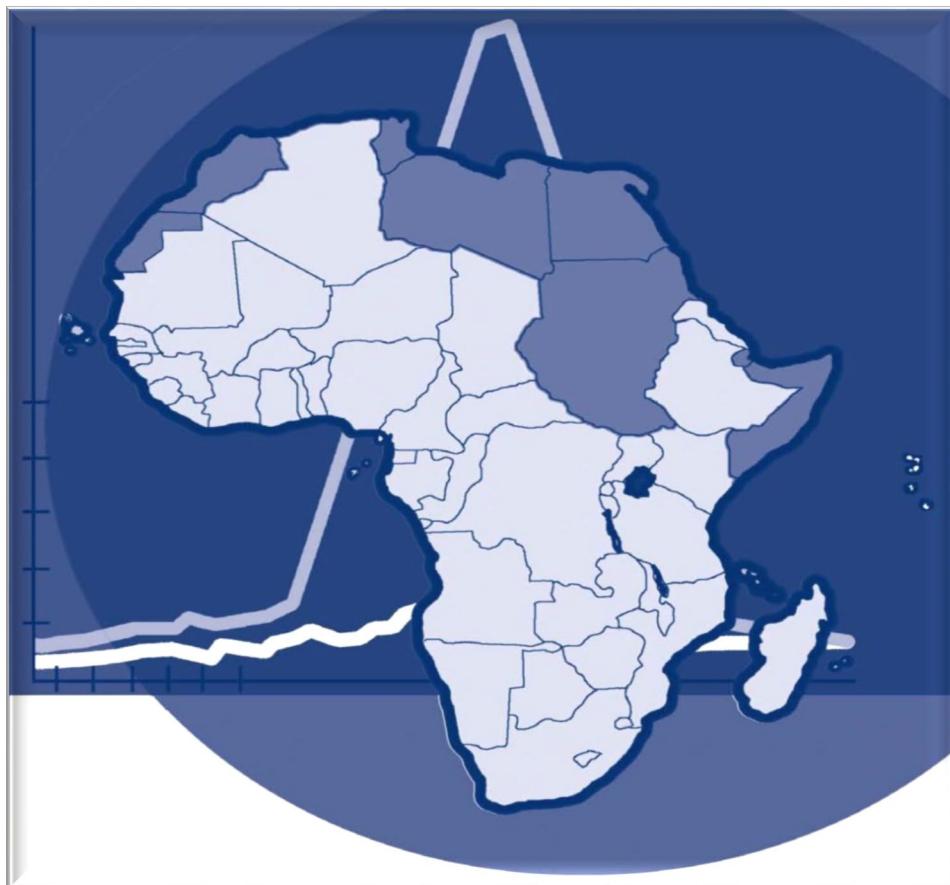


TECHNICAL GUIDELINES FOR

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE IN THE WHO AFRICAN REGION

THIRD EDITION

BOOKLET THREE: SECTIONS 4, 5, 6 AND 7



This booklet comprises the following sections of the Integrated Disease Surveillance and Response Technical Guidelines:

Section 4: Investigate suspected outbreaks and other public health events

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

Section 6: Respond to outbreaks and public health events

Section 7: Risk communication

TECHNICAL GUIDELINES FOR INTEGRATED DISEASE SURVEILLANCE AND RESPONSE IN THE WHO AFRICAN REGION

THIRD EDITION

BOOKLET THREE: SECTIONS 4, 5, 6 AND 7

MARCH 2019

World Health Organization
Regional Office for Africa
WHO Health Emergency Programme
Brazzaville, Republic of Congo

Centers for Disease Control and Prevention
Center for Global Health
Division of Public Health Systems and Workforce Development
Atlanta, Georgia, USA

Integrated Disease Surveillance and Response Technical Guidelines: Booklet Three: Sections 4, 5, 6, and 7

WHO/AF/WHE/CPI/03, 2019

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ABBREVIATIONS

AAR	after-action reviews
AEFI	adverse events following immunization
AFP	acute flaccid paralysis
AFRO	WHO Regional Office for Africa
AWD	acute watery diarrhoea
CDC	Centers for Disease Control and Prevention
CDO	county diagnostic officer
CBS	community-based surveillance
CBIS	community-based information system
CEBS	community event-based surveillance
CFR	case fatality rate
CHA	community health assistants
CHSS	community health services supervisor
CHO	county health officer
CHT	county health team
CHV	community health volunteer
CSO	County Surveillance Officer
DDO	district diagnostic officer
DHIS2	district health information system version 2
DHO	district health officer
DHT	district health team
DPC	Disease Prevention and Control Department
DRM	disaster risk management
DSO	district surveillance officer
EBS	event-based surveillance
eDEWS	electronic disease early warning system
EOC	emergency operations centre
EPI	Expanded Program on Immunization
EPR	emergency preparedness and response
EVD	ebola virus disease
HCF	health care facility
HCW	health care worker

HIV/AIDS	human immunodeficiency virus and acquired immunodeficiency syndrome
HMER	health management information systems, monitoring and evaluation and research units
HMIS	Health Management Information System
HPO	health promotion officer
IDSR	Integrated Disease Surveillance and Response
IBS	Indicator Based Surveillance
IMS	Incident Management System
IEC	information, education and communication
IMC	International Medical Corps
IOM	International Organization for Migration
IPC	infection prevention and control
IHR 2005	International Health Regulations (2005)
IRC	International Rescue Committee
JEE	Joint External Evaluation
LISGIS	Liberian Institute of Statistics and Geo-Information Services
MCH	maternal child health
MDR	multidrug resistance
MEF	monitoring and evaluation framework
MOH	Ministry of Health
MOA	Ministry of Agriculture
MTI	Medical Teams International
NGO	nongovernmental organization
NNT	neonatal tetanus
NSTCC	National Surveillance Technical Coordination Committee
OIC	officer in charge
PCI	Project Concern International
PHE	public health events
PoE	points of entry
PHEIC	public health emergency of international concern
PHEMC	Public Health Emergency Management Committee
PPE	personal protective equipment
RRT	rapid response team
RTA	road traffic accident
SARS	severe acute respiratory syndrome

SCI	Save the Children International
SFP	surveillance focal point
SIMEX	simulation exercise
STI	sexually transmitted infections
UNICEF	United Nations Children's Emergency Fund
VHF	viral haemorrhagic fever
WHO	World Health Organization
XDR	extensively drug-resistant

FOREWORD

For more than 20 years, the World Health Organization (WHO) Regional Office for Africa has worked with technical partners to develop and implement comprehensive public health surveillance and response systems in countries.

The first edition of the Integrated Disease Surveillance and Response (IDSR) technical guidelines (2002) was widely adopted and adapted by Member States in the Region. The second edition (2010) responded to key developments including revision of the International Health Regulations (IHR, 2005), the emergence of new diseases, conditions and events and the formulation of strategies for disaster risk management. Noncommunicable diseases were included along with community-based surveillance and alignment with broader health system strengthening objectives.

With the unprecedented Ebola virus disease outbreak of 2014 in West Africa, among other recent health emergencies, health security remains a priority for WHO.

Health security starts with strong surveillance systems. This third edition of the IDSR guidelines describes what needs to be established at each level of the health system in order to detect, confirm and respond to diseases, conditions and health events. The guidelines are intended for use by:

- health workers at all levels, including surveillance officers, clinicians, laboratory personnel and public health workers
- provincial, regional and district health teams
- data managers
- IHR national focal points and other sectors implementing IHR
- competent authorities at points of entry
- veterinary and wildlife health officers
- environmental health officers
- health training institutions
- supply chain officers
- other public health experts, including nongovernmental organizations.

The guidelines serve as:

- a general reference for surveillance activities at all levels and a stand-alone reference for responsibilities at each level;
- a set of standard definitions for threshold levels to initiate response actions for specific diseases;
- a resource for developing training, supervision, monitoring and evaluation of surveillance activities; and
- a guide for improving early detection of and response to epidemic prone diseases.

Member States, the United States Centres for Disease Control and Prevention and many relevant stakeholders have worked closely with the WHO Secretariat in preparing this third edition. Together, we must now ensure these guidelines are implemented within the context of health system strengthening toward universal health coverage; better coordination between human and animal health surveillance and other sectors involved in a “One Health approach”; improved use of laboratory network capacity in surveillance and response; and better community engagement in public health interventions.

Recognizing that surveillance is a public health good and a cost-effective intervention, it is my hope that all stakeholders will come together in implementing these guidelines. Together we can contribute to ensuring that one billion people of the African Region are better protected from health emergencies.



Dr Matshidiso Moeti
WHO Regional Director for Africa

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

The purpose of revising these IDSR technical guidelines was to:

- (a) Align with the current situation and needs of the Member States.
- (b) Align with the objectives, targets and elements of the WHO Africa Region's strategy for health security and emergencies 2016–2020.
- (c) Update the guidelines with contemporary information, taking into consideration new developments such as: emerging and re-emerging priority diseases, conditions and events.
- (d) Incorporate recent recommendations from expert panels on strengthening the IHR, 2005 that are underpinned on the One Health approach.
- (e) Holistically address disaster risk management (DRM) strategies.
- (f) Take into account lessons learnt from the unprecedented EVD outbreak in West Africa, polio eradication and other humanitarian crises.
- (g) Take advantage of technology advancement and utilize the opportunities offered by the internet and mobile phones to scale up the implementation of real time community event-based surveillance (CEBS), with robust geographical information system (GIS) platforms.
- (h) Scale up other electronic surveillance systems and incorporate new ways for capacity building using the IDSR eLearning tools.

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 100 surveillance and disease experts at WHO, CDC and Ministries of Health in African countries who conceived and produced the 1st and 2nd Editions.

The revision process involved internal WHO consultation followed by a wider consultation that involved a series of meetings with various partners and Member States. 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 held in March 2018.

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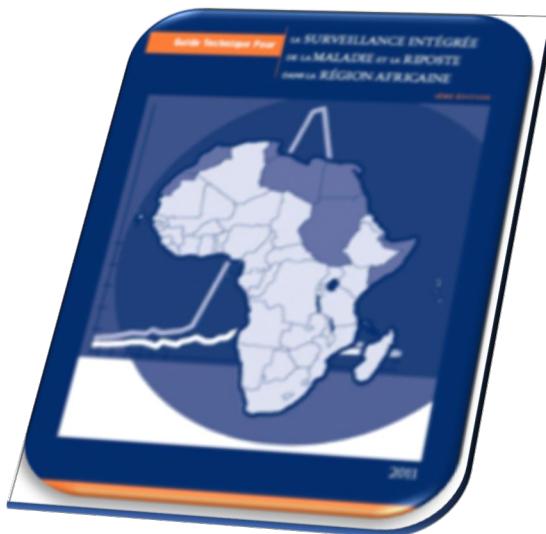
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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES

THIRD EDITION



SECTION 4: INVESTIGATE SUSPECTED OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

MARCH 2019

SECTION 4: INVESTIGATE SUSPECTED OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

4. INVESTIGATE AND CONFIRM SUSPECTED OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

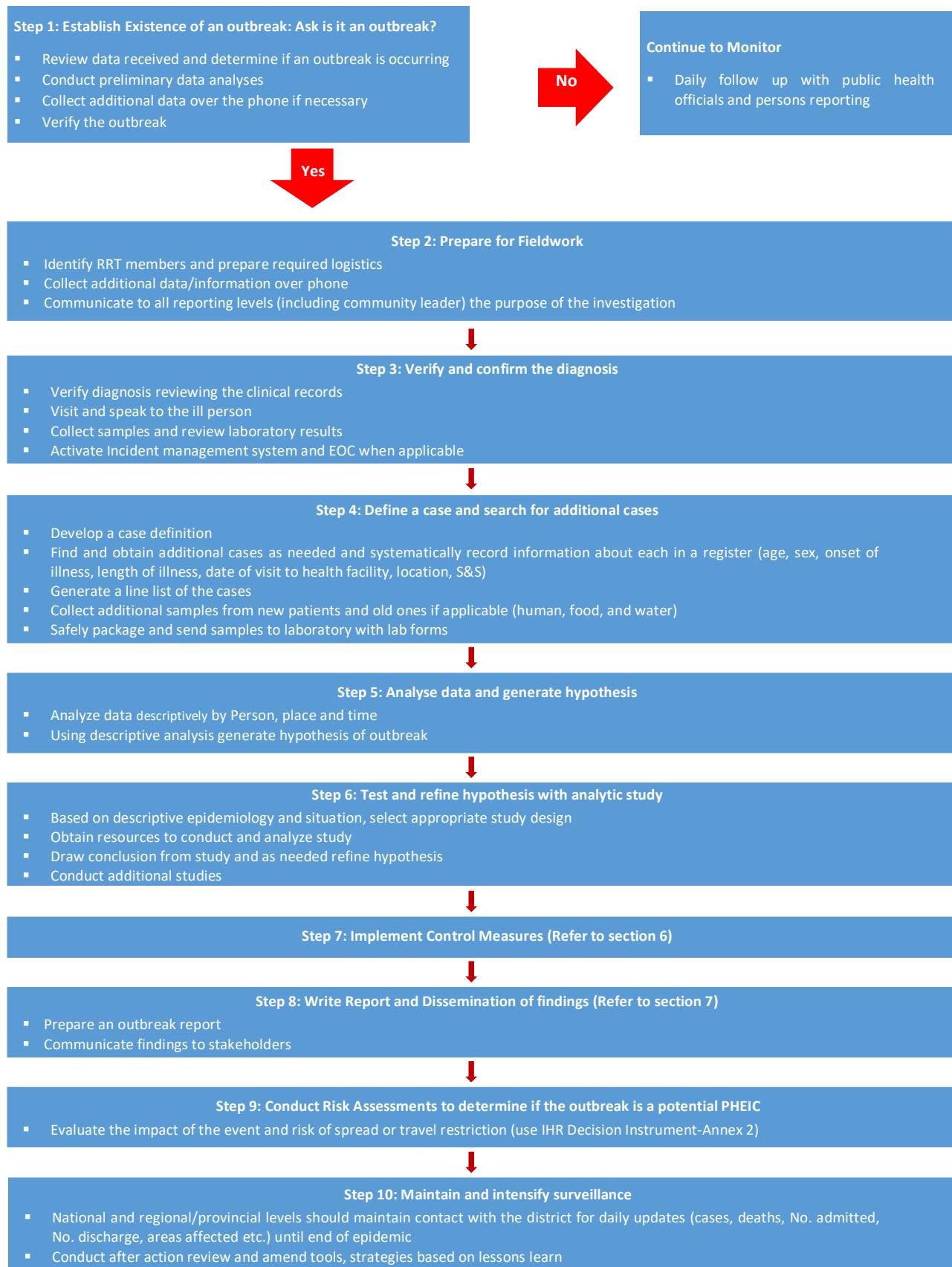
This section presents the steps that should be taken when conducting an outbreak investigation. An outbreak is defined as an increase in the number of cases of a disease or an event above what is normally expected within the population in a given area over a particular time period. When an outbreak or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

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

The purpose of an investigation is to:

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

Figure 4.1: Steps in outbreak investigation



I. Decide to investigate a reported outbreak or public health event

An entity's responsibility and capacity to investigate an outbreak depends on national policy, resources availability and local policy. In most countries, districts have overall responsibility for investigating outbreaks. These guidelines assume that the district level has responsibility for leading the investigation; they also apply to health facilities and provinces/regions.

For some communicable diseases, a single suspected case is the trigger for taking action, reporting the case to a higher level and conducting an investigation because these are dangerous diseases with the potential for rapid transmission or high case fatality rates if they are not treated promptly. The trigger for other diseases is when cases reach a defined **threshold** (e.g. a particular number of cases per 100 000 population) within a given community, geographical area or season. Sometimes a single case of a communicable disease long absent from a population, or caused by an agent (e.g. bacterium or virus) not previously recognized in that community or area, or the emergence of a previously unknown disease or event, may also constitute an outbreak and should be reported and investigated.

Health personnel should promptly investigate the problem and respond to immediate cases. Preparations for taking a wider public health response should also be made. Alert and epidemic thresholds are also described in Section 11.0 in detail.

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

Still, some urgent health events require the immediate commencement of investigations. *Regardless, districts should aim to investigate suspected outbreaks and events within 48 hours of notification from the lower level.*

Conduct an investigation when:

- (a) the district receives a report on the suspected outbreak of a disease targeted for immediate notification;
- (b) an unusual increase in the number of cases or deaths is noted during routine data analysis;
- (c) alert or epidemic thresholds have been reached for specific priority diseases; the initial trigger for a new epidemic-prone disease could be the laboratory;
- (d) communities or social media report rumours of deaths or a large number of cases that are not brought to the health facility;

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

II. Verify the reported information

Outbreak investigation requires human, logistic and financial resources. When a suspected outbreak or event is reported, promptly verify that the information is accurate and reflects conditions that suggest a true outbreak or event. This will help to ensure that resources are used effectively. To verify the information, consider the following factors:

- source of information (e.g., Is the source of the rumour reliable? Is the report coming from a health facility, a community or social media?);
- severity of the reported illness and use of standard case definition for reporting;
- number of reported cases and deaths;
- age and gender disaggregation of reported cases or deaths;
- mode of transmission of suspected pathogen and risk of wider transmission;
- political or geographical considerations;
- importance of maintaining good partnership and community relations;
- available resources; and
- determining whether it is an event of national or international concern.

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

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

III. Record reported outbreaks, public health events and rumours

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

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

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

4.1 Prepare to conduct an investigation

4.1.1 Mobilize Public Health Emergency Rapid Response Team (PHERRT)

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

Mobilize the district Public Health Emergency Rapid Response Team (PHERRT) and make arrangements for investigating the report. The PHERRT is a technical, multidisciplinary team that is available for quick mobilization and deployment to support the field response to a suspected or confirmed outbreak or event. Include the district coordinator for the disease or event being investigated and any other relevant staff members 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 trained public health workers who can rapidly be mobilized to fulfil the following functions:

- (a) coordination;
- (b) surveillance;
- (c) laboratory confirmation;
- (d) clinical case management;
- (e) infection prevention and control (IPC);
- (f) environmental health and sanitation;
- (g) social mobilization and risk communication;
- (h) animal health (as applicable); and
- (i) logistics.

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

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

- (a) coordination team leader;
- (b) clinician – to oversee case management including infection prevention and control (IPC);
- (c) public health nurse;
- (d) surveillance officer;
- (e) epidemiologist;
- (f) data manager;
- (g) laboratory scientist;
- (h) environmental health officer/scientist;
- (i) veterinary/livestock officers/wildlife officers;
- (j) social mobilization and risk communication officer;
- (k) psychosocial support (PSS) officer;
- (l) logistics officer;
- (m) others based on the specific characteristics of the outbreak (e.g., water sector expert in the case of a cholera outbreak; an expert in chemicals or radio-nuclear sciences or even the Food and Drugs Authority in case of suspected poisoning from mines).

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

Work with the team to 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. Also discuss on the stakeholders or parties involved. The national and regional/provincial levels may deploy staff to support the districts in the investigation and response to outbreaks/public health emergencies as per the national policy.

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

4.1.2 Specify the respective tasks and expected roles of PHERRT team members

Inform health staff about the tasks they will be expected to carry out during the investigation and the functions they will support. Specify tentative timelines for the work. Contribute to the positive motivation for conducting the investigation. For example, make sure that the investigation team understands the link between the investigation results and the selection of response activities for preventing additional cases and saving lives. Ensure that all health and non-health staff in the team have access to and know how to use the required personal protection equipment (PPE) and the universal precautions that should be taken to forestall the possible cause of the suspected outbreak or event.

4.1.3 Define supervision and communication lines

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

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

4.1.4 Decide on the area where the investigation will take place

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

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

4.1.5 Obtain the required authorizations

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

4.1.6 Finalize forms and methods for collecting information and specimens

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

- (a) record case information on a line list for later use in summarizing variables for use in time, place and person analysis;
- (b) fill the appropriate request forms, label laboratory samples properly and use a unique ID number for a given case;
- (c) prepare (and update as needed) an epidemic curve;
- (d) construct a spot map showing the location of geographical variables such as location of cases and deaths; and
- (e) develop analysis tables for risk factors, age group, sex, immunization status and so on.

4.1.7 Arrange transportation and other logistics

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

4.1.8 Gather supplies for collecting laboratory specimens

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

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

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

Refer to the disease-specific guidelines in Section 11.0 for laboratory requirements.

4.2 Verify and confirm the outbreak or event

4.2.1 Review the clinical history and epidemiology

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

- (a) Where do you live?
- (b) When did the symptoms begin?
- (c) Who else is sick in your home, school, workplace, village, neighbourhood?
- (d) Where have you travelled to recently?
- (e) Where have you been living recently prior to the onset of symptoms (residence at time of infection)?
- (f) Were you visited by anyone recently?
- (g) Who took care of you when you started feeling sick?
- (h) Have you been in contact with sick or dead animals (both domestic and wildlife) recently (for zoonosis)?
- (i) Have you been in contact with any sick or dead person?
- (j) Has anybody died in the community you live recently?
- (k) Did you participate in the burial ceremony? (What role did you play?)
- (l) For suspected AEFIs, what vaccines have you received recently?

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

If the disease can be confirmed by laboratory testing, refer to the laboratory requirements in 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 that some diseases may require additional food or environmental samples to aid in diagnosis and ensure that these

samples are also collected; e.g. water samples for cholera outbreaks and food samples for foodborne outbreaks.

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

4.3 Define and search for additional cases

4.3.1 Define a case

After establishing that an outbreak is occurring, and verifying the correct diagnosis, a crucial step is to define what constitutes a case in this investigation. In Section 11.0, a list of standard case definitions for most IDSR priority diseases is already available. Even in situations where a case definition might be available, specific outbreaks may require the inclusion of other details in the case definitions such as: geographical location, attendance at an event or travel to a certain location. In some circumstances, you might encounter a new disease not listed in Section 11.0 and you will then have to develop an operational case definition. The common elements of a case definition include information on symptoms, date of onset of symptoms, laboratory results and the essential elements of person, place and time.

4.3.2 Isolate and treat cases as necessary

Use the case definition to isolate cases. Isolation is a critical step in limiting the spread of the disease and keeping health care facilities open and health care workers available. Depending on the suspected disease immediate isolation may be required to protect staff, patients and community members. Ensure the cases in isolation units have access to facilities like water and toilets. As indicated by the case management guidelines, strengthen infection prevention and control (including isolation of patients if indicated) and case management where the patients are being treated. Provide the health facility with advice, support and supplies.

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

4.3.2 Search for additional cases

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

I. Search for suspected cases and deaths in the health facility records

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

See Annex 4D at the end of this section for instructions on how to conduct a register review. Make sure to follow up any 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 chemical sellers, 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 have been any recent deaths. If such recent deaths have occurred, find out the signs and symptoms experienced by the person(s) who died. Enquire about the persons who took care of these people when they were sick and about preparation of the dead before and during the burial ceremony. Collect information that will help to describe the magnitude and geographical scope of the outbreak.

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

4.4 Develop a line list and record information about the additional cases

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

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

- (a) Patient’s name, address, and village or neighbourhood and locating information: If a specific address is not available, record information that can be used to contact patients if additional information is needed or to notify the patient about laboratory and investigation results;
- (b) Patient’s age and sex: This information is used to describe the characteristics of the population affected by the disease;
- (c) Date of onset of symptoms and date the patient was first seen at the health facility;
- (d) Status of the patient, whether dead or alive: If dead, record date of death;
- (e) Relevant risk factor information such as immunization status if the disease being investigated is a vaccine-preventable disease; or occupation if you suspect that the outbreak targets a particular occupation;
- (f) Name and designation of the person reporting the information: Some diseases have their own more detailed case investigation form. Detailed forms outlining particular information for investigating specific diseases are found in the Annexes at the end of Section 11.0.
- (g) Complete the case investigation form for any new cases (See Annex 2A) and record the details on the line list (Annex 4E).

4.5 Analyse data about the outbreak

Outbreak data analysis is similar to the analysis of summary data as described in Section 3. Data on the outbreak is analysed and re-analysed several times during the course of the 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, the source of the outbreak (from a single source such as a well or a funeral), and the persons at risk of becoming ill (for example, young

children, refugees, person living in rural areas, and so on). Present the data, taking into account time, place and person analysis (refer to Section 3) as follows:

- (a) Draw a histogram representing the course of the disease (an “Epi” curve);
- (b) Plot the cases on a spot map;
- (c) Make tables of the most relevant characteristics for cases (e.g., age group relative to vaccination status, sex ratio, case occurrence relative to type of occupation, etc.);
- (d) Calculate case fatality rates (refer to the steps in Section 3).
- (e) Apart from calculating the case fatality rate in outbreak situations, you may also wish to calculate the **attack rate**. See Section 3 on how to calculate the attack rate.

4.5.1 Interpret analysis results

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

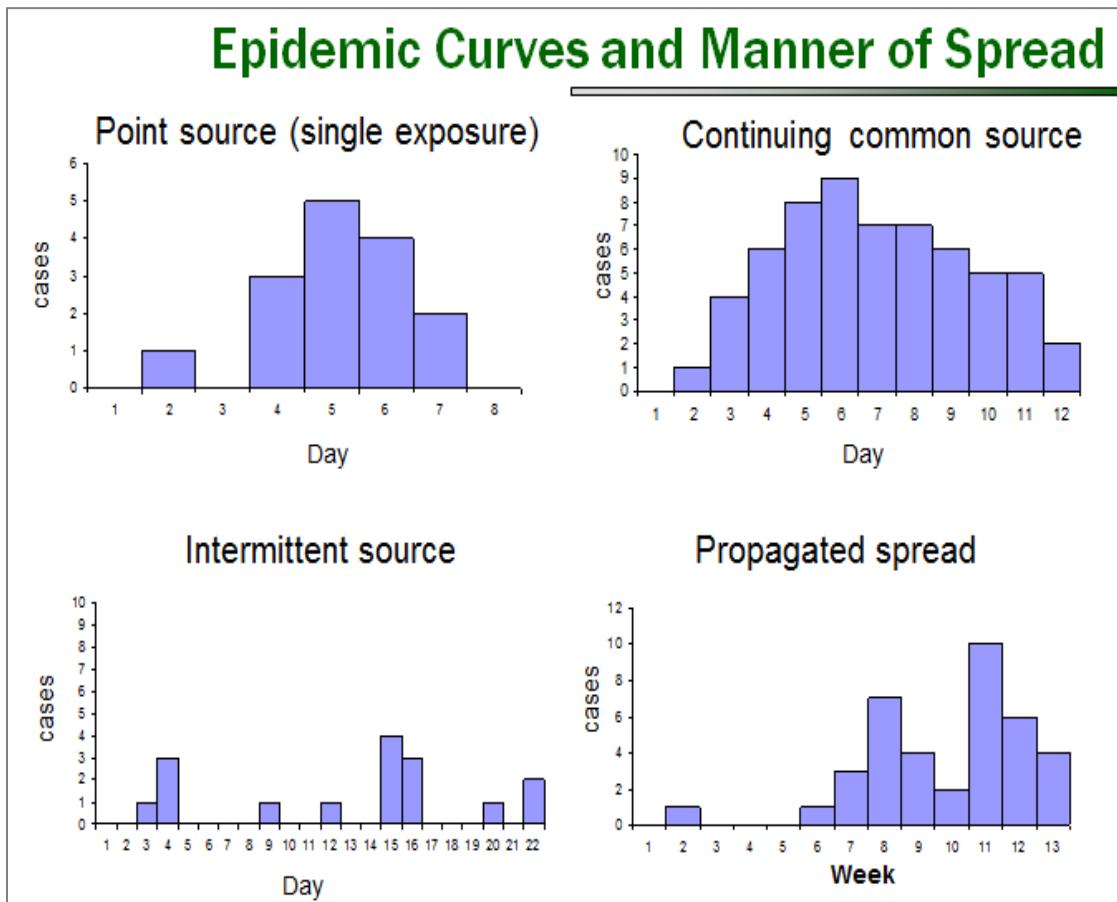
- (a) What was the causal agent of the outbreak?
- (b) What was the source of infection?
- (c) What was the transmission pattern?
- (d) What control measures were implemented and to what effect?

I. Interpret the time analysis results

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

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

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



II. Interpret the place analysis results

Use the map to:

- describe the geographical scope of the problem and identify high-risk areas; and
- 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 generated from the person analysis is essential for planning the outbreak response because it describes more precisely the high-risk group(s) for transmission of this disease or condition. For example, if yellow fever cases occurred in patients less than 15 years of age, then the immunization response might need to target children who fall within that age bracket.

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

Table 4.1: Cholera attack rate by age group, Mankhowkwe Camp, Malawo, March-May 1988

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%

Source: Reproduced with permission of the publisher, from Moren et al., 1991

IV. Analyse data and generate hypothesis

- (a) Conduct a descriptive analysis of the data (person, place and time).
 - From the observations gathered during the descriptive process, a hypothesis can be generated about the causes of observed patterns and the factors that increase risk for a given outbreak. For instance, in Table 4.1 above, one might hypothesize that the older the patient, the more likely he/she will fall ill. Hence, you might want to determine if age is associated with illness.
- (b) Using descriptive analysis, generate a hypothesis of on the outbreak.
 - To test a hypothesis, use the analytic epidemiology process to answer questions on how and why the population was affected.

V. Test and refine hypothesis with an analytical study

- (a) Select the appropriate study design based on descriptive epidemiology and the situation.
- (b) Obtain resources to conduct and analyse the study.
- (c) Draw conclusions from the study and, as needed, refine the hypothesis.

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

4.6 Report writing and dissemination of findings

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

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

- (a) Confirmation of the situation as an outbreak or public health problem;
- (b) Population affected and at risk;
- (c) Possible causes of the outbreak/ public health problem, laboratory results, source of infection, mode of transmission, attack rate, case fatality rate and possible risk factors;
- (d) Measures already initiated to contain the outbreak;
- (e) Recommendations: For controlling the situation further investigation/studies may be recommended. The district rapid investigation team should then immediately prepare an outbreak investigation report. This detailed outbreak investigation report should be prepared and disseminated immediately to the health facility where the outbreak occurred and to the district, region and WHO.

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

- To understand the spread of the disease, you should draw a transmission tree starting with the index case. Moreover, the transmission tree facilitates understanding of the relative contributions of different settings to the spread of the disease in a given geographical area and is thus crucial for regulating infection transmission and adopting control measures. Reconstruction of a transmission chain or tree is possible provided the information is obtained from a line list, and a review is conducted on the timeline of dates of illness or contact with other cases, field investigations and rapid risk assessment. The transmission tree is highly relevant as it facilitates documentation of the routes of transmission in a given geographical area and thus makes it easier to plan interventions. The tree needs to be updated frequently and if a new cluster of cases starts in any part of the district try to ask questions to know if there is any linkage. See Annex 4J for an example of how to draw a transmission tree.

4.7 Implement prevention and control measures

Once an outbreak is identified, control measures are important for interrupting disease transmission and or limiting exposure to the source of infection. If a pathogen or other suspected source of the outbreak is identified, control measures should target specific agents, sources or reservoirs of infection. Section 11.0 provides a description of some of the control measures for each priority diseases and references for further reading.

Outbreak control measures are intended to:

- (a) control the source;
- (b) control of secondary transmission; and
- (c) prevention 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, nonspecific control measures can be put into place regardless of the type of disease or source.
- Ensure multisectoral engagement throughout response; i.e., at the community level and with other non-health stakeholders who might be crucial to the management of particular outbreaks. Examples if you want to enforce by law, you might need assistance from the Ministry of Home Affairs (Policemen).
- At some point during the outbreak, the public health response might include testing new potential countermeasures including vaccines and therapeutics. Thus, biomedical research can be an important and discrete component of the response. Public health efforts must always remain at the forefront of the overall outbreak response. The research conducted must be scientifically and ethically sound in order to reach definitive conclusions on efficacy and safety as expeditiously as possible. It is the role of the National Level to liaise with the Ethical Committees within the country to provide a useful guide for analogous principles in outbreak situations in such settings.

4.8 Conduct an assessment to determine if the event is a potential public health emergency of international concern (PHEIC)

Risk assessment should be initiated as soon as possible by the designated investigation team to address the following questions:

- Is the public health impact of the event serious?
- Is the event unusual or unexpected?
- Is there a significant risk of international spread?
- Is there a significant risk of international travel or trade restrictions?

The national level may be called upon to participate in the risk assessment at the end of which the decision will be made on whether the event is a potential PHEIC, hence warranting its notification (*IHR decision instrument*, http://www.who.int/ihr/revised_annex2_guidance.pdf).

4.9 Maintain and intensify surveillance

The national and regional levels should maintain contact with the district for daily updates (cases, deaths, number admitted, number discharged, areas affected, etc.) until the end of the epidemic.

Ensure that the same IDSR mechanism is used to enhance surveillance of events, and that the system is flexible enough to allow adaptation of additional variables to be collected using the existing system. This will avoid parallel reporting which can lead to confusion on the progress of the outbreak.

- Periodically, report on progress of response, and prepare daily situation reports which can be used to evaluate the response.
- Update the line list, conduct data analysis by time, person and place.
- Monitor effectiveness of the outbreak response activity.

During investigation, it is important also to intensify surveillance with neighbouring districts to ensure that the outbreak does not spread to another district. It is important to share information and also plan for joint surveillance and response activities. Neighbouring districts may also initiate the establishment of cross-border disease surveillance and response committees so that there is sharing of surveillance data, epidemiological and other related information during the outbreak.

4.10 Conducting regular risk assessment after the outbreak has been confirmed

As soon as the outbreak is confirmed, it is important to conduct regular assessment at each stage of the outbreak. The assessment is needed to orient and focus interventions. The risk assessment should include:

- (a) evaluating the susceptibility of the population and potential for spread of the event both in the affected and in neighbouring areas;
- (b) evaluating the risk of further transmission, morbidity and mortality. To that end, the factors that can be considered include population characteristics such as size, density, movement, and setting; under five mortality rates; period of the year (considering potential for seasonal outbreaks) and plans for any festivals or other social events that will result in increased opportunities for spread; access to health services etc.

Risk assessment should be repeated as new information becomes available. It may also be repeated on a regular timetable. For some events, different risk assessment teams may be required to work collaboratively to assemble the information for a composite picture of the risk (e.g. clinical severity, transmission dynamics and control measures). At the conclusion of the event, all the risk assessments should be formally reviewed. The systematic analysis of well-documented risk assessments identifies where improvements can be made in the management of acute public health events in future.

4.11 Annexes to Section 4

- Annex 4A** District log of suspected outbreaks and rumours
- Annex 4B** Checklist of laboratory supplies for use in an outbreak investigation
- Annex 4C** Recommended list of personal protective equipment
- Annex 4D** How to conduct a register review
- Annex 4E** Sample line list
- Annex 4F** Contact recording sheet
- Annex 4G** Contact tracing form (follow-up)
- Annex 4H** Triple packaging of samples during an outbreak
- Annex 4I** Example of an analytical study to test hypothesis
- Annex 4J** How to create a transmission tree

Annex 4A: District log of suspected outbreaks 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 (1)	Source of suspected outbreak or rumour (newspaper, telephone etc) (2)	Number of cases initially reported (3)	Number of deaths initially reported (4)	Location (health centre) (5)	Date district was notified (6)	Date suspected outbreak was investigated by the district (7)	Result of district investigation (Confirmed, Ruled Out, or Unknown) (8)	Date outbreak began (9)	Date onset of index case (10)	Date crossed threshold or first cluster (11)	Date a case was first seen at a health facility (12)	Date specific intervention began (13)	Type of concrete intervention that was begun (14)	Date on which district notified national level of the outbreak (15)	Date district received national response (16)	Comment (include if sample taken and results) (17)	Name and signature

Annex 4B: Checklist of laboratory supplies for use in an outbreak investigation

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

- Pieces of bar soap for hand-washing
- Bleach for decontamination
- Supply of PPEs (gloves, mask, gowns, etc.)
- Triple package and refrigerant for sample transportation,
- Safety boxes for collecting and disposing of contaminated supplies
- Equipment (Biosafety cabinet)

For collecting laboratory specimens:

Blood

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

Blood films (malaria)

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

Respiratory specimens Swabs

- Viral transport medium

Cerebrospinal fluid (CSF)

- Local anaesthetic
- Needle and syringe for anaesthetic
- Antiseptic skin disinfectant
- Sterile screw-top tubes,
Cryotube, dry tube, sterile gloves, surgical mask, sterile gauze, adhesive bandage, lumbar puncture needle,
- Microscope slides in a box
- Trans-Isolate transport medium
- Latex kit
- Gram stain
- May Grunewald Giemsa Kit

Stool

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

Plague

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

If health facility has a centrifuge:

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

For packaging and transporting samples:

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

Reagents and supplies for testing

- Reagents
- Media (MacConkey, Blood agar,
- others

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

In some events which present with fever, it might be important to carry rapid diagnostic kits for malaria (mRDT) if they are not available in a nearby health facility

Annex 4C: Recommended list of personal protective equipment (PPE)

The following equipment should be available for the personal protection of all staff investigating a suspected case with highly infectious disease; e.g., viral haemorrhagic fever, avian influenza etc. (See reference for the guidelines to use and select PPE at the end of the section). The equipment should be held at provincial/regional level, if the PPE kits are inadequate; the PPE should be prepositioned in high-risk provinces/regions which are likely to report these specific outbreaks or which have been identified to be at risk through risk assessment. See Annex 5A for other stocks that may be needed to respond to a suspected outbreak.

Composition of one set of PPE	WHO deployment kit
1 surgical gown	100 surgical gowns
1 coverall	100 coveralls
1 head cover	100 head cover
2 pairs of goggles	50 pair of goggles
1 pair of rubber gloves	100 pairs
1 mask N95	200 pieces
1 boot cover*	0
1 box 50 pairs of examination gloves	800 pairs of examination gloves
1 plastic apron re-usable	20 pieces
1 pair of gum boots	20 Gum boots
1 hand sprayer	2 of 1.5 litres each
1 Back sprayer	1 back sprayer of 10-12 litres
Specimen containers	
Scotch of tapes	3 rolls
Anti-fog for goggles	3 bottles
Chlorine	
N.B: chlorine and gum boots can be purchased locally; 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 admitted to the health facility during a specific period. Explain that the information will be used to determine what caused the outbreak or increase in number of cases. The register should be used for:

- Any inpatient facility with **more than 10 hospital beds**. Give priority to government health facilities.
- Large reference or teaching hospitals with paediatric wards because they receive referrals from other health facilities.
- Small hospitals or health facilities that serve remote areas and high-risk populations. Examples are nomadic groups, refugees or areas without regularly scheduled health services.

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

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

3. Arrange to conduct the review.

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

4. Identify sources of information.

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

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

- the patient's name and location;
- the signs and symptoms;
- date of onset of symptoms and outcome (for example, date of death, if relevant); and
- immunization status, if appropriate to this disease.

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

5. Conduct the record review at the scheduled date and time.

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

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

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

7. Provide feedback to the health facility staff.

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

8. Report any suspected cases to the next level.

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

Annex 4E: Sample Line List

No.	Name of patient	District or community	Ward	Locality	Age	Sex (M/F)	Occupation	Date of onset	Date seen at HF	Diarrhoea (Y/N)	Severe dehydration (Y/N)	Specimen	Results	Hospitalized (Y/N)	Place of admission	Treatment given	Outcome	Date of discharge or death	Comments
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			

Annex 4F: Contacts recording sheet

Contacts¹ Recording Sheet filled in by _____

Case name _____ Case number (if assigned) _____

Case's Village/neighbourhood _____ Chief or Community leader _____

District/Town _____ Province/Region _____

Date of symptom onset _____ Hospitalized/Found in the community _____

If hospitalized, Hospital _____ Date of Admission: _____

Contacts are defined as persons who:

1. sleep in the same household with a suspected case;
 2. have direct physical contact with the case (dead or alive);
 3. have touched the linen or body fluids of the case;
 4. have eaten or touched a sick or dead animal.

Annex 4G: Contact tracing form (follow-up)

Contact Tracing Form – by Village Team Volunteer's name

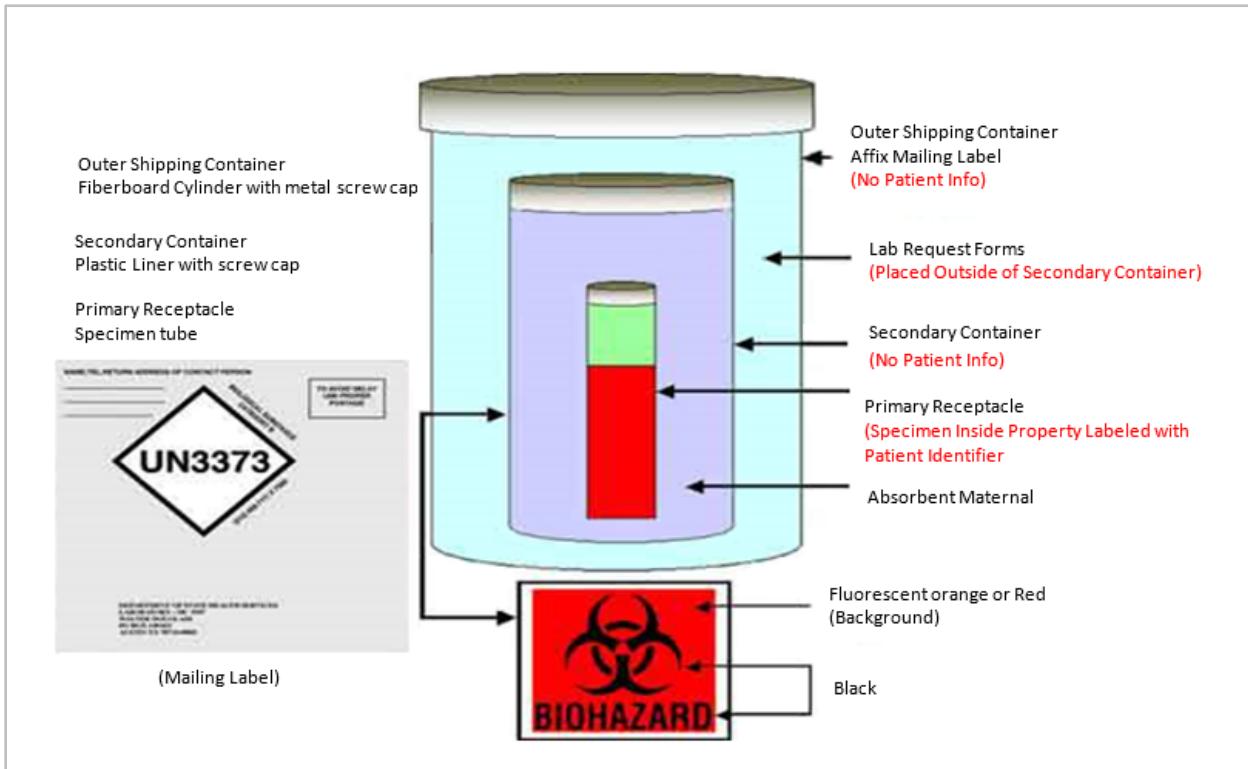
Village **Chief or Community leader**

District/Town..... Province/Region

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

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

Annex 4H: Types of Triple Packaging of samples during an Outbreak



Source: <https://medicine-science-and-more.com>

Annex 4I: Example of an Analytical study to test hypothesis

Case control study to determine potential exposures to cholera in Central African Republic. The unadjusted matched analysis indicates that persons who ate cold cassava leaves (one of the staple foods in the region (Odds ratio (OR) = 3.07; 95% Confidence Interval (C.I) = [1.155; 8.163]; P = 0.020)) were at greater odds of having cholera. The association was statistically significant at P < 0.05.

Risk factors	Odds ratio	95% Confidence interval	P values
Drinking water from the Oubangui river	1.16	[0.415 ; 3.239]	0.983
Drinking water sold on the street	0.25	[0.027 ; 2.421]	0.422
Eating cold cassava leaves	3.07	[1.155 ; 8.163]	0.020
Eating hot cassava leaves	0.57	[0.090 ; 3.669]	0.900
Attending funerals from September 2011	0.56	[0.192 ; 1.643]	0.627
Washing hands after using the toilet	0.85	[0.295 ; 2.493]	0.395
Eating outside	0.66	[0.259 ; 1.713]	0.206
Eating dried meats	0.45	[0.184 ; 1.208]	0.062
Eating fresh meats	0.41	[0.143 ; 1.228]	0.060
Eating hot smoked fish	0.83	[0.328 ; 2.111]	0.354
Eating cold smoked fish	0.89	[0.360 ; 2.235]	0.410
Washing hands before eating	1.05	[0.318 ; 3.512]	0.466

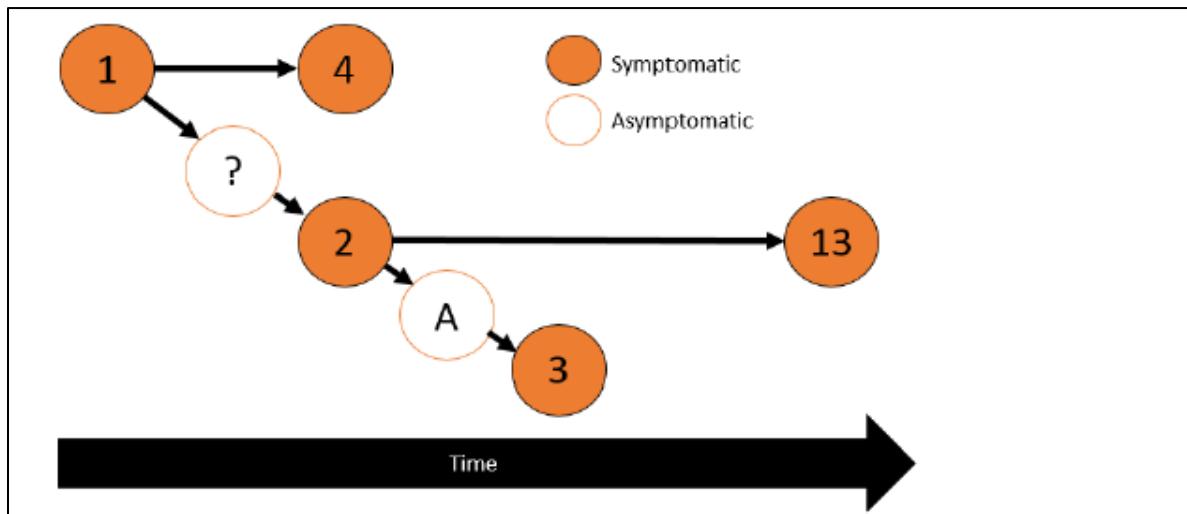
Excerpt obtained from <https://www.cdcfoundation.org/sites/default/files/upload/pdf/2011CholeraOutbreakReport.pdf>

Annex 4J: An example on how to create a transmission tree

Consider the following scenario which describes an outbreak of a respiratory illness, where the investigation team had information on 13 cases.

- (a) The first case was a 25-year old university student with onset of symptoms on 21 March 2012. He was admitted to Zarqa public hospital on 4 April 2012 after a week of coughing, fever and shortness of breath. The patient was diagnosed with pneumonia and pericarditis, and he was soon transferred to the coronary care unit (CCU). As his condition worsened, he was transferred to Prince Hamzah hospital for further treatment; he was intubated in ICU the next day and died on 25 April 2012. Investigators were told that during his illness, the patient was in close contact with his mother (who did not report illness) and two health care workers (cases 2 & 3). His illness was later laboratory-confirmed as the novel coronavirus (3).
- (b) The second case was a 30-year-old male nurse in the CCU at Zarqa hospital. His symptoms started about 29 March 2012. He had not travelled or had contact with animals in the 10 days prior to his illness, though he was in close proximity to the first case in the CCU. On 8 April, case 2 was admitted to the CCU at Zarqa with shortness of breath and pneumonia and was later discharged with no sequelae from Islamic hospital on 23 April. The patient was in close contact with two household members, including his mother (case 13) and a man that did not get sick (who was also the brother of case 3) (3).
- (c) Case 3 was a 40-year-old female nurse in the ICU at Zarqa hospital whose illness was laboratory-confirmed after her death. Her symptoms began on 2 April 2012, and she was admitted to Zarqa hospital ICU after developing pneumonia 7 days later. She was later transferred to ICU at Islamic hospital where she died on 19 April. During her illness, she was in close contact with 4 household members, including another brother who fell ill 10-days post exposure (case 9), and three others that were not affected. One month prior to her illness, her sister had visited from Saudi Arabia (3).
- (d) Case 4 was a 65-year-old male doctor whose symptoms of fever and fatigue started 2 April 2012 and developed into pneumonia. The doctor opted to stay home during his illness and soon recovered. He had not travelled or had contact with animals in the 10-days prior to his illness. His household members did not report any illness (3).
- (e) Cases 5 through 13 occurred in the second phase of the outbreak, with the onset of symptoms occurring between 11-26 April 2012. All except case 13, who was the mother of case 2, had direct contact with one or both laboratory-confirmed cases. None of the health care workers had travelled or had contact with animals. The health care workers reported that they only used gloves when treating patients to avoid stigmatizing them.

Basing on this information, and a line list, a transmission tree can be sketched as follows:



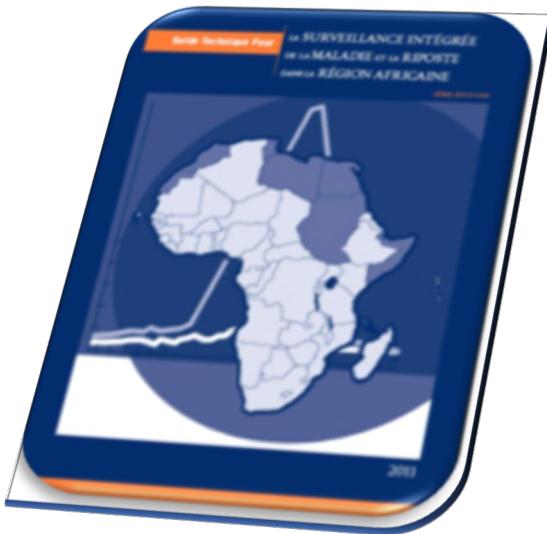
Footnote: Extract from "Applied Public Health Case Study Scenarios for Training Public Health Professionals. Case studies developed under CDC/AFENET agreement". Transforming Public Health Surveillance. (pages: In press). Location: Elsevier

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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES

THIRD EDITION



SECTION 5: PREPARE TO RESPOND TO OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

MARCH 2019

SECTION 5: PREPARE TO RESPOND TO OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

5. PREPARE TO RESPOND TO OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

Rapid and effective response to a public health emergency such as a suspected outbreak or other public health event not only calls for an immediate response but is also one of the core capacities required by International Health Regulations 2005. Being prepared to detect and respond to such an event is an essential role of the district, regional and national levels.

Preparations for public health events include:

- (a) establishment of the Public Health Emergency Management Committee (PHEMC);
- (b) development of functional Public Health Emergency Operating Centres (PHEOC) that will act as a command and control centre for coordination of public health emergencies or events/incidents at least at the national level as well as a similar coordination structure at the subnational level;
- (c) development of policies, plans and procedures for conducting operations, mapping available resources, estimating and procuring the required supplies and conducting simulation exercises to test systems; and
- (d) identification and training of key members of Public Health Emergency Management Subcommittees and Public Health Emergency Rapid Response Teams (PHERRT).

In addition, having a public health emergency preparedness and response plan (PHEPR) is crucial. The PHEPR should include the layout of the coordinating structure, the mapping of risks and how to address and maintain the emergency response plan for relevant events, including the capacity to support operations at primary response level during a public health emergency. The PHEPR is the overarching plan and should be complemented by a PHEOC plan and an event- or incident-specific plan (ISP). The PHEOC plan guides the operations of the command and coordination centre, outlining standard operating procedures on how each functional area operates and how they work together; and the ISP is a plan developed to address high priority emergency events based on risk analysis and is always annexed to the PHEPR plan.

5.1 Establish a permanent public health emergency operations centre (command and control centre) for oversight of public health emergency preparedness and response activities

Response to public health events would be successful if there is a more, coherent, effective and efficient coordination of various actors representing a multisectoral team within the context of the One-Health approach. Ultimately, this will also help to reduce the impact of the event in the community. The International Health Regulations (IHR 2005) require that State Parties develop, strengthen and maintain their capacity to respond promptly and effectively to public health risks and public health emergencies.

Countries should establish the PHEOC, at least at the national level, to act as a command and control centre that enhances coordination and oversees public health emergency preparedness and response activities. To establish a PHEOC, countries should develop legislation or an executive directive to mandate and allow the health ministry or the public health agency to establish and manage a PHEOC. This mandate will then outline the ministry or the public health agency's roles and responsibilities, and lay out the coordination mechanisms with overall national disaster management resources, and a funding mechanism to enable the operations of the PHEOC. The PHEOC will then act as a command and control centre and be a hub for the coordination of information and resources to support incident or event management activities, thus ensuring a coordinated response to emergencies that involve health consequences and public health threats.

The PHEOC will need to develop the following essential elements so as to be fully functional in its support to emergency preparedness and response:

- (a) plans and procedures for operations;
- (b) telecommunication technology and infrastructure to enable timely communication;
- (c) information system to support informed decision-making; and
- (d) trained human resources.

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 Risk Management EOC to manage escalated events of national magnitude. It is highly recommended that the PHEOC is positioned at the highest level where there is already an organ mandating the coordination of public health emergencies. The PHEOC is located in the office of the Chief Medical Officer in some countries and in the office of the Director for Health in others. In countries having a National Public

Health Institute, it is located in the office of the Director for Public Health Institutes. In most countries, the PHEOC reports to the Minister for Health.

During public health emergencies, the PHEOC, which is the command and control centre guided by the National PHEMC, is activated and functions as a centre for decision-making and the coordination of information and resources for strategic management of public health events and emergencies. The PHEOC uses the Incident Management System (IMS), which is a standardized approach to managing and coordinating the response by providing a common hierarchy for staff response. In the context of IDSR, the IMS is represented by the Public Health Emergency Management Committee (PHEMC) at strategic level, which will assemble during activation of PHEOC; as well as the National Public Health Emergency Management Subcommittees which are also present at the operational level. The IMS outlines the specific roles and responsibilities of responders during an event, while providing a common framework for government, the private sector and nongovernmental organizations to work seamlessly together. In IMS, each person is assigned a specific role and follows a set command structure. It can be staffed with additional teams of subject matter experts, analysts, logisticians and support staff depending on the situation at that particular time. The operational structure of PHEOC (command and control centre) can also be scaled up, which is essential for maintaining its effectiveness and it can be modular (i.e. can be partially or fully activated) depending on situational needs (*See WHO Framework for a Public Health Emergency Operation Centre*).

Most importantly, IMS should be functional at all levels of health system delivery (national, region/province and district). Once the IMS is activated during public health emergencies, it is important for the PHEMC to meet regularly (at least daily or weekly) to facilitate coordination, communication and information-sharing; adopt containment measures; and facilitate the deployment of the Public Health Emergency Rapid Response Team (PHERRT). During activation, the PHEOC will also help to ensure the flow of information horizontally and vertically to the respective departments, relevant sectors and partners, thus facilitating relief operations.

Having a command and control centre is essential for preparedness and response to public health events. If the resources are available, regions and districts will need to have PHEOCs, with basic facilities that support the direct coordination of preparedness and response to public health emergencies, facilitate real-time communication and information between various stakeholders at their levels, and ensure that there is a mechanism for sharing information with the national-level PHEOC. In some countries, however, similar existing coordinating structures or mechanisms currently exist at the subnational level (region/province and district) which also acts as command and control centres; i.e. the district PHEMC and the associated management subcommittees, which also use the same IMS structure of the PHEOC during public health emergencies. Such structures

should be used to continue supporting the coordination of preparedness and response activities, to ensure real-time communication and information-sharing between various actors at these levels and the national level.

When inactive, the PHEOC (command and control centre) usually reduces in size and respective members under various Public Health Emergency Response Management Subcommittees return to their respective working stations. The few staff remaining at the centre will then liaise with respective sections or departments to continue maintaining plans and procedures; conducting training and simulation exercises as well as routine and event-based surveillance activities; and maintaining the systematic database of the resources available, such as important phone numbers, names and addresses of important government and non-government officials, international bodies and NGOs.

5.2 Establish a district, regional, and national public health emergency management committee (PHEMC)

Public health emergency management committees (PHEMC) should be established at all levels – national, regional and district. PHEMC members across all levels should work closely with their counterparts to plan and monitor the implementation of public health emergency plans. These coordinating committees should operate at their respective levels and are composed of technical and non-technical members from the health and other sectors. The role of PHEMC is to develop and oversee the implementation of emergency preparedness strategies, action plans and procedures.

The PHEMC can also be referred to as a policy group. At the national level, the PHEMC provides policy direction on the implementation and operation of the national PHEOC and also provides oversight, policy and strategic guidance on the implementation of functional PHEOCs or similar coordination structures or mechanisms at the subnational levels.

The PHEMC committee will also mobilize funds for PHEOC development and sustainability. The PHEMC committee will provide oversight for PHEOC operations and, in the absence of pre-established mutual aid arrangements with other jurisdictions, it may also be the authority that handles requests for external material or financial assistance, particularly in complex, multisectoral or multijurisdictional emergencies.

5.2.1 Identify functions of the public health emergency management committee (PHEMC)

- (a) Ensure coordination and integration of surveillance and response activities across all levels.
- (b) Develop a national/regional/district emergency preparedness and response plan to manage all potential emergencies including disease outbreaks and detection of other emerging public health events or hazards; and clearly stipulate surge capacity to respond to public health emergency at district, regional or national level.
- (c) Map available human and material resources: experts, logistics including distribution, finance etc.
- (d) Periodically review and update the plan in response to any changes in technical, managerial or epidemiological situation or any other risk identified.
- (e) Liaise with National Disaster Management Agency (NDMA) to ensure multisectoral preparedness and response.
- (f) Establish a community communications plan for sharing information with communities before, during and after any public health emergency. The plan should include mapping of all communication channels--community radio, data on cellular and internet penetration, NGO/FBO networks, prearranged agreements with cellular companies, other platforms (women's groups etc.) that can be leveraged for reaching the public. The plan should also include liaison activities with relevant partners in multiple sectors including points of entry and other required reporting sites.
- (g) Coordinate community risk mapping activities within the district and ensure that all reporting sites are aware of the use of thresholds for reporting acute outbreaks or events.
- (h) Identify and mobilize resources for emergency prevention and control including procurement of response and communication supplies. There should also be a mechanism to monitor the use of resources before, during and after the emergency event.
- (i) Ensure that emergency material stockpiles at the district/regional/national levels are monitored, procured and updated regularly.
- (j) Enhance linkages with community-based surveillance focal persons to ensure flow of data for early detection of public health events.
- (k) Coordinate training of community, health facility, and district/regional/national personnel in emergency preparedness and response.
- (l) Ensure that there is periodic organization of emergency response simulation activities at the national, regional, district and community levels.
- (m) Coordinate the post-emergency evaluation and plan to disseminate findings with the affected communities.

- (n) Ensure provision of efficient administrative and financial management support including human resources; cash flow by estimating, tracking and approving response-related expenditure; monitoring and coordination of funding from all sources.
- (o) Ensure that the facilities' communication technology and information system is ready to support any type of emergency.
- (p) Oversee the activation of the national PHEOC and similar coordination structures at the subnational level (region/province and district), during public health emergencies. Furthermore, activation of the IMS structure; i.e., formation of Public Health Emergency Management Subcommittees and deployment of the Public Health Emergency Rapid Response Teams.
- (q) Hold regular meetings to strengthen preparedness capacity (e.g., training health care workers (HCWs)) during periods when there are no public health emergencies.

5.2.2 Identify members of the Public Health Emergency Management Committees (PHEMC)

Organize the PHEMC to include a mix of representatives from the public, nongovernmental organizations (NGO) and private sectors to match the functions listed above. For example, in the district level committee, participants from the public sector may include:

- (a) district administrator/coordinating director or equivalent;
- (b) district police commissioner;
- (c) district civic or community representative, municipal/district chief executive, mayor;
- (d) district director of health services;
- (e) district medical officer;
- (f) medical superintendents-in charge of hospitals;
- (g) district director of veterinary/agricultural services or equivalent;
- (h) district public health nurse;
- (i) district disease control officer or equivalent;
- (j) district environmental health officer or equivalent;
- (k) district education officer;
- (l) district water officer;
- (m) district engineer;
- (n) wildlife officer;
- (o) natural resources and veterinary experts;

- (p) laboratory technician or laboratory technologist from the district laboratory (for both human and animals);
- (q) district community development officer;
- (r) immigration officer;
- (s) officer responsible for risk communication;
- (t) legal officer;
- (u) senior military / national security officer;
- (v) influential leaders - Members of parliament, tribal chiefs, religious leaders, etc.

NB: At the regional and national levels, an equivalent of the above should be used in order to ensure a more comprehensive multisectoral structure. At the national level, consider including directors from other key relevant ministries, heads of agencies, national health research institutes (human and animal). Members of the IHR National Focal Point should always be part of the national team.

From nongovernmental organizations with health care activities in the area, include representatives from:

- (a) community health programs and faith-based health facilities;
- (b) Red Cross, Red Crescent or similar agencies working in the area;
- (c) local NGOs;
- (d) civil society organizations; and
- (e) UN organizations.

From the private sector, include representatives from:

- (a) private health facilities;
- (b) private laboratories;
- (c) pharmacists or chemists;
- (d) business community;
- (e) research and training institutions; and
- (f) professional associations.

NB: The PHEMC should have a chairperson; e.g., someone holding the highest political position in the district.

5.2.3 Public Health Emergency Management Committee (PHEMC) meetings

When there is no outbreak or any other public health event, the PHEMC should meet regularly, on a monthly or quarterly basis, in order to:

- (a) review the national public health emergency preparedness and response plan;
- (b) exchange information on risk monitoring. It should be emphasized that other relevant health sectors can equally benefit from information provided by the human health sector and vice versa. In some events, human cases can be the first indication of a threat to other sectors. For example, animal health services will be impacted by cases of Crimean-Congo haemorrhagic fever, as cases in humans constitute the primary indicator for viral circulation in animals as infection is asymptomatic in livestock. For instance, vaccination among livestock might be crucial if human cases of anthrax or rift valley fever have been detected as a signal of asymptomatic diseases among animals;
- (c) review disease trends and updates on preparedness steps;
- (d) review the level of preparedness at the beginning of each epidemic season (e.g., before the period when cases of meningitis increase);
- (e) monitor stocks of equipment for event investigation and response;
- (f) share the conclusions and recommendations of these meetings with respective committees at all levels; and
- (g) organize simulation exercises/drills to test the effectiveness and efficiency of the EPR plans.

It should be noted that the PHEOC if already established will serve as a hub for coordinating these activities. If not, a similar coordination structure or mechanism will serve the same purpose.

During an *emergency or outbreak response*, the PHEMC should:

- (a) meet as soon as the outbreak or event is established;
- (b) conduct situational analysis and grade the level of the event;
- (c) activate the PHEOC or similar coordinating structures at the national and subnational levels and deploy PHERRT to the field to investigate and respond to the event. It will also activate the Public Health Emergency Management Subcommittees (*See 5.3 for a detailed description of part of the technical teams with their roles and responsibilities*);
- (d) assess the need for and request support from the higher level, if need be. For example, a district will request support from the regional or national EPR or Public Health Emergency Rapid Response Teams when necessary;
- (e) meet at least daily at the beginning of an outbreak or event and weekly as the response continues;

- (f) regularly review the outbreak response and take action to improve outbreak control actions as indicated;
- (g) document and communicate outbreak response actions to the next higher level; and
- (h) conduct an after-action review.

5.3 Establish Public Health Emergency Management Subcommittees at all levels

The Public Health Emergency Response Subcommittees are formed by the PHEMC to oversee the daily management of the public health emergencies. They consist of technical and non-technical teams, tasked with oversight of the daily management of the event/incident and provide feedback to the PHEMC committee for decision-making.

They are subdivided into technical and non-technical teams depending on their functions as shown in Table 5.1 below.

Table 5.1: Functions of Public Health Emergency Management Subcommittees

Subcommittee	Members (experts, organizations)	Description of tasks
Coordination/Management subcommittee	<p>Overall Chair EPR: (Permanent Secretary/Chief Director at national and subnational levels, appointed Government officials in the rank of Administrative Officials or similar)</p> <p>Example of members at the district level:</p> <ul style="list-style-type: none"> • District administrator / coordinating coordinator or equivalent • District police commissioner • District civic or community representative (for example, the district chief executive) • District director of health services • District medical officer • Medical superintendents-in charge of hospitals • District director of Veterinary/Agricultural services or equivalent • District public health nurse • District disease control officer or equivalent • District environmental health officer or equivalent • District education officer • District water officer • District engineer • Wildlife officer • Natural resources and veterinary experts • Laboratory technician or laboratory technologist from the district laboratory, both human and animal • District community development officer • Immigration officer • Officer responsible for risk communication 	<ul style="list-style-type: none"> • Coordinate all aspects of the operations response, planning and management including: Selecting participating organizations and assign responsibilities • Design, implement and evaluate control interventions • Coordinate technical EPR subcommittees and overall liaison with partners • Submit daily situation report on the evolution of the outbreak • Manage information for the public and news media • Provide operational support including mobilization of resources • Ensure staff well-being, security

Subcommittee	Members (experts, organizations)	Description of tasks
	<p>From nongovernmental organizations with health care activities in the area, include representatives from:</p> <ul style="list-style-type: none"> • Community health programs and faith-based health facilities • Red Cross, Red Crescent or similar agencies working in the area • Local NGOs • Civil society organizations <p>From the private sector, include representatives from:</p> <ul style="list-style-type: none"> • private health facilities • private laboratories • pharmacists or chemists • business community • research and training institutions • professional associations 	

(i) Finance and administration

Finance and Administration	<p>Chair: PS at National level District level: District Administrator/Executive Officer/Planning and Budget Officer</p> <p>Members:</p> <ul style="list-style-type: none"> • May include experienced health administrators, finance/accounts officers, budget officers and logisticians. <p>Technical Staff -District Medical Officer or Medical Officer in Charge, Laboratorians</p>	<ul style="list-style-type: none"> • Track expenditure, makes payments and provide administrative services • Ensure appropriate cash flow management, track material and human resources, monitor costs, prepare and monitor the budget and keep administrative records
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(ii) Logistics

Logistics	<p>Chair: Pharmacist/ Logistics Officer</p> <p>Members:</p> <ul style="list-style-type: none"> • Supplies/ Stores assistants • Pharmacists or dispensers • Technical assistance from the Ministry of Health • Partners supporting logistics management 	<ul style="list-style-type: none"> • Provide budget support/ funding for epidemic preparedness & response • Procure equipment and supplies • Maintain adequate stocks of supplies and equipment • Arrange for transport and communication systems • Liaise with other agencies for logistical support • Provide accountability for all the resources used during epidemic preparedness & response
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(iii) Planning

Planning	<p>Chair: An appointed Government official in the rank of administrative official or similar)</p> <p>Members:</p> <ul style="list-style-type: none"> • Chairs of the all subcommittee • Appointed members from EPR committee 	<ul style="list-style-type: none"> • Evaluate the situation (information gathering and analysis), evaluates available options and monitors resources.
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(iv) Technical subcommittees

Subcommittee	Members (experts, organizations)	Description of tasks
Case management and infection prevention and control	<p>Chair: Physician or physician assistant from Ministry of Health, or the district, regional or referral hospital</p> <p>Example of members at the district level:</p> <ul style="list-style-type: none"> • District police commissioner • District director of health services • District medical officer • Medical superintendents-in charge of hospitals • District director of Veterinary/Agricultural services or equivalent • District public health nurse • District disease control officer or equivalent • District environmental health officer or equivalent • District education officer • District water officer • District engineer • Wildlife officer • Natural resources and veterinary experts • Laboratory technician or laboratory technologist from the district laboratory, both human and animal • District community development officer • Customs • Immigration officer <p>From NGOs with health care activities in the area, include representatives from:</p> <ul style="list-style-type: none"> • 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: 	<ul style="list-style-type: none"> • Ensure the availability of guidelines and SOPs for case management and infection prevention and control in all health facilities • Strengthen isolation facilities and reinforces infection prevention and control measures • Conduct risk assessment of health care workers • Ensure that appropriate medical care is provided to patients • Provide ambulance services – collection of suspected cases from the community using the defined referral system • Collect data from all treatment facilities (if available) and submit it to the surveillance subcommittee • Ensure appropriate disinfection of homes and environments with suspected/ probable/ confirmed cases/ deaths of an infectious disease • Conduct safe burial of the dead from isolation facilities and community deaths • Ensure the training and refresher training of health workers in the isolation facility and other health facilities in the affected district

Subcommittee	Members (experts, organizations)	Description of tasks
	<ul style="list-style-type: none"> • private health facilities • private laboratories • pharmacists or chemists • business community • research and training institutions • professional associations 	
Surveillance and Laboratory	<p>Chair: Surveillance Officer or Epidemiologist (National/Regional/District levels)</p> <p>Co-chair: Laboratory Focal Person</p> <p>Example of members at the district level:</p> <ul style="list-style-type: none"> • District police commissioner • District director of health services • District medical officer • Medical superintendents-in charge of hospitals • District director of Veterinary/Agricultural services or equivalent • District public health nurse • District disease control officer or equivalent • District environmental health officer or equivalent • District education officer • District water officer • District engineer • Wildlife officer • Natural resources and veterinary experts • Laboratory technician or laboratory technologist from the district laboratory, both human and animal • District community development officer • Immigration officer • Counsellors • Assembly man • Port Health officer <p>From nongovernmental organizations with health care activities in the area, include representatives from:</p> <ul style="list-style-type: none"> • Community health programs and faith-based health facilities • Red Cross, Red Crescent or similar agencies working in the area • Local NGOs • Civil society organizations <p>From the private sector, include representatives from:</p> <ul style="list-style-type: none"> • A representative from private health facilities • A representative from private laboratories 	<ul style="list-style-type: none"> • Ensure the availability of all surveillance guidelines and tools in the health facilities • Ensure the use of the outbreak case definition • Conduct active case finding, case investigation, contact tracing and follow-up • Verify suspected cases/ alerts/ rumours in the community • Ensures proper filling of case investigation, contact tracing and follow-up forms • Ensure proper collection, packaging, transport, and testing of specimens from suspect/ probable cases/ deaths • Communicate test results to clinical services • Conduct data management and provides regular epidemiological analysis and reports • Train health personnel in disease surveillance • Ensure close linkage with burial, infection control and social mobilization groups.

Subcommittee	Members (experts, organizations)	Description of tasks
	<ul style="list-style-type: none"> • Pharmacists or chemists • Representatives of business community • Research and training institutions • Professional associations 	
Risk Communication and Social Mobilization	<p>Chair: Health promotion officer</p> <p>Example of members at the district level:</p> <ul style="list-style-type: none"> • District police commissioner • District director of health services • District medical officer • Medical superintendents-in charge of hospitals • District director of Veterinary/Agricultural services or equivalent • District public health nurse • District disease control officer or equivalent • District environmental health officer or equivalent • District education officer • District water officer • District engineer • Wildlife officer • Natural resources and veterinary experts • Laboratory technician or laboratory technologist from the district laboratory, both human and animal • District community development officer • Immigration officer <p>From nongovernmental organizations with health care activities in the area, include representatives from:</p> <ul style="list-style-type: none"> • Community health programs and faith-based health facilities • Red Cross, Red Crescent or similar agencies working in the area • Local NGOs • Civil society organizations <p>From the private sector, include representatives from:</p> <ul style="list-style-type: none"> • private health facilities • private laboratories • business community • research and training institutions • professional associations 	<ul style="list-style-type: none"> • Ensure the availability of risk communication materials and plans • Conduct rapid assessment to establish community knowledge, attitudes, practices and behaviour on prevailing public health risks/events • 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

Subcommittee	Members (experts, organizations)	Description of tasks
	<ul style="list-style-type: none"> • Social workers • Technical assistance from the Ministry of Health • Partners supporting psychosocial services 	<ul style="list-style-type: none"> • 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)	<p>Chair: Environmental Health Inspector or Water engineer (National/Regional/District levels):</p> <p>Members:</p> <ul style="list-style-type: none"> • Environmental Health technician or WASH Officer • Ministry of Public Work • Health Inspectors • Technical assistance from the Ministry of Health • Partners supporting WASH e.g. UNICEF 	<ul style="list-style-type: none"> • Conduct environmental health risk assessment for the outbreak • Ensure provision of clean water • Improve water management at household and community level. • Plan for sanitation improvement campaign • Plan for improved hygiene practices including hand-washing, food hygiene and sanitation
8. Vaccination campaign	<p>Chair: Child survival, EPI focal point, or Cold Chain Technician Members (National/Regional/ District levels):</p> <ul style="list-style-type: none"> • MCH supervisor • Clinician in charge • Nurse in charge • Reproductive and child health coordinators • Partners supporting vaccination • e.g. WHO, UNICEF • Community leaders • Technical assistance from the Ministry of Health 	<ul style="list-style-type: none"> • Identify high-risk groups during the outbreak that should be targeted for vaccination • Compute the targeted population for the vaccination campaign • Conduct micro-planning for all vaccination logistics including cold chain facilities, vaccine delivery and distribution, human resource needs, waste handling, social mobilization • Conduct the vaccination campaign and post vaccination campaign validation exercise

5.4 Establish Public Health Emergency Rapid Response Teams at all levels

A Public Health Emergency Rapid Response Team (PHERRT) is a technical, multidisciplinary team that is readily available for quick mobilization and deployment in case of emergencies to effectively investigate and respond to emergencies and public health events that present significant harm to humans, animals and environment irrespective of origin or source. PHERRT should be established at the district, regional and national levels. See Section 4.2 for the composition of the PHERRT.

Roles and responsibilities of the national, regional and district PHERRT

- (a) Investigate rumours and reported outbreaks, verify diagnosis and other public health emergencies including laboratory testing;
- (b) collect additional samples from new patients and old ones if necessary (human, animals, food, and water);

- (c) conduct follow-up by visiting and interviewing exposed individuals, establish a case definition and work with community to find additional cases;
- (d) assist in laying out mechanisms for implementing infection prevention and control measures;
- (e) assist in generating a line list of cases and conduct a descriptive analysis of data (person, place and time) to generate hypothesis, including planning for a further analytical study;
- (f) propose appropriate strategies and control measures including risk communications activities;
- (g) establish an appropriate and coordinated risk communication system through a trained spokesperson;
- (h) coordinate rapid response actions with national and local authorities, partners and other agencies;
- (i) initiate implementation of the proposed control measures including capacity-building;
- (j) conduct ongoing monitoring/evaluation of the effectiveness of control measures through continuous epidemiological analysis of the event;
- (k) conduct risk assessments to determine if the outbreak is a potential PHEIC;
- (l) prepare detailed investigation reports to share with PHEMC committee;
- (m) contribute to ongoing preparedness assessments and final evaluation of any outbreak response;
- (n) meet daily during outbreaks and quarterly when there is no outbreak; and
- (o) participate in simulation exercises.

5.5 Risk mapping for outbreaks and other public health events

Vulnerability, risk assessment and mapping is used as an aid to preparedness to identify at-risk areas or populations, rank preparedness activities and engage with key policy and operational partners. This includes mapping and assessing risks (in the catchment area) with the potential to affect community health. Such mapping must address all acute health risks, and not be restricted to communicable diseases. The exercise should consider identification and mapping across all levels, from the national right down to the regional and district levels. For example, include evaluation of drinking water sources or food storage methods and animal breeding areas and movements.

This process should be ongoing and updated periodically. For example, once a year, assess those risks and record the information on a map. This is useful information when considering supplies, transport and other resource issues necessary for the response.

Countries may use the WHO Strategic Tool for Prioritizing Risks (STAR), which is a tool used to assess a wide range of hazards including the health consequences of natural or human-induced emergencies, the health events covered under IHR (zoonosis, chemical, radio-nuclear, food safety) and also events occurring in neighbouring countries or regions. The tool will assist the district or regional or national level to formulate priorities for the development of contingency

plans and specific responses, and also can be used to outline the potential needs to enhance national capacity in terms of preparedness and response (Strategic Tool for Addressing Risk, STAR, WHO, DRAFT Version 3.3.1 (2017/07/27). Countries may also use the 2008 Tripartite "[Zoonotic Diseases: A Guide to Establishing Collaboration between Animal and Human Health Sectors at the Country Level](#)", which is due to be updated and be a global document by the end of 2019 (<https://www.oie.int/doc/ged/D12060.PDF>).

5.6 Resource mapping

In preparing for outbreaks, there is need to undertake resource mapping to identify the available resources in every geographical area. This ensures prompt mobilization and distribution of such resources (both material and human) in an outbreak situation. Some of the resources can also be obtained from other sectors in the district or region or from development partners and NGOs at the respective levels.

5.7 Prepare an emergency preparedness and response plan

There should be all hazard plans developed for preparedness and response for national, regional and district levels. The plans at all levels should be in line with the overarching national preparedness and response plan for the health sector and consistent with the overall national policies, plans and emergency management principles. The purpose of this plan is to build the ability of the national and subnational levels to respond promptly when an outbreak or other public health event is detected.

This plan should:

- (a) be based on risk assessments conducted through a multisectoral approach and should specify the resources available for emergency preparedness and response;
- (b) take into consideration diseases with epidemic potential in the country, region, district, and neighbouring countries;
- (c) take into account all other events (All hazard approach) and cover the IHR core capacity requirements of Annex 1 A. Core capacity requirement for surveillance and response (IHR 2005, Third edition);
- (d) take into account point-of-entry activities for strengthening surveillance and response;
- (e) lay out concept of operations (CONOPS) including clear lines of accountability, decision-making authorities and processes, procedures for activation /deactivation, call for assistance etc.;

- (f) describe the surge capacity to respond to public health emergencies of national, regional and district concern;
- (g) provide estimates of the population at risk for epidemic-prone diseases and other public health emergencies;
- (h) clearly indicate for each suspected outbreak which reference laboratory will be used for confirmation;
- (i) provide estimates of needed quantities of medicines, vaccines, supplies, laboratory reagents, and consumables for each epidemic-prone disease likely to occur;
- (j) identify training needs and develop a training plan for all staff including Public Health Emergency Rapid Response Teams;
- (k) describe the procedures and plans to relocate or mobilize resources to support response
- (l) describes the procedures for risk communication; and
- (m) the plan should be tested before implementation and periodically through simulation exercises.

NB: The plan should also include how to institutionalize health facility and community resilience building, and preventive interventions based on risk analysis and mapping.

Table 5.2: Elements of Emergency Preparedness and Response Plan

Key sections of the emergency preparedness and response plan should include:
<ol style="list-style-type: none"> 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 (antiviral, antimicrobial, decontamination, disinfection or others as indicated), infection prevention and control, isolation facilities, management of a mass casualty event; 8. pre- and post-exposure prophylaxis treatment; 9. 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 including supply lists; 15. environment, water and sanitation; 16. decontamination of patients and environment, including management of dead bodies; 17. monitoring of the outbreak or event; 18. resource mobilization and procedures to relocate or mobilize resources 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, 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 regional and global stockpiles of various items which may be used during an outbreak.

As follow-up to the public health risk assessment activity, each level from districts to regions to national level should set up a contingency stock of medicines, vaccines, reagents and supplies to ensure prompt management of the first cases. For the subnational level, this is critical before support arrives from higher levels. Ensure that, there are also quick mechanisms for sending supplies from the central level. Also, regularly and carefully monitor the contingency stock in order to avoid shortages and expiry of medicines, vaccines, reagents and supplies. Examples of stock management tools are included in the annexes at the end of this section. The content of the contingency stock varies with the nature of epidemic-prone diseases and the risk of outbreak in the district. Risk assessment activities help to develop a list of minimum materials that should be stockpiled at the district and community levels. If all districts and community levels cannot be stockpiled with minimum materials, ensure that a designated point (health centre, district) is identified to ensure the quick release of these items when needed during an outbreak.

Partnerships with other implementing agencies such as NGOs, concerning stockpiles of appropriate medicines and vaccines and other materials, should be established in advance at all levels (national, regional and district).

A suggested list of contingency medicines and supplies is available in Annex 5A at the end of this section.

5.7.2 Conduct stock management for outbreak response

Maintain and preposition a sufficient stock of supplies and materials for responding to an outbreak or public health event before an outbreak occurs. These supplies should be stored in safe and adequate conditions as required.

Use an inventory checklist such as the one in Annex 5B to assess which supplies are already available for use during a response activity. If the supplies are already available, determine if they can be set

aside for use during a response. If they are not available, can they be purchased or requested through the national procurement system?

Periodically (e.g., every 4 months) make sure the supplies are dry, clean, not expired, not deteriorated and ready for use and that the mechanisms to assess them are available.

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

- (a) List all items needed to conduct surveillance, laboratory activities and response; items necessary for detecting and responding to priority diseases, conditions and events. Consider the availability of:
 - (i) case definition posters; registers, including the line list register; and the required reporting forms/referral forms;
 - (ii) laboratory reagents and supplies as well as diagnostic reagents and kits;
 - (iii) Specimen collection, storage and transport kits including Triple Package containers,
 - (iv) various surveillance and response guidelines for specific diseases as well as laboratory SOPs;
 - (v) case management guidelines, medicines, supplies and other field intervention materials.
- (b) Make an inventory and note the quantity of each item that is available.
- (c) Complete and regularly update a stock balance sheet for each item.
- (d) Observe expiry dates and practice best logistical practices for packing, shipping, storing and disposing of supplies and materials.
- (e) Establish a critical or minimum quantity for each item that would need to be on hand for an investigation or response activity. Consider logistic and epidemiologic factors in establishing minimum quantities.
- (f) Monitor the stock balances against the critical quantity established.
- (g) Report regularly on the IDSR stock situation. See Annex 5C for an example of a stock item transaction and balance sheet.

5.7.3 Update the human resources available for response as well as other logistical support for response to public health events at all levels

- (a) Update yearly list of all surveillance focal persons from all reporting sites including community level.
- (b) Update roster of Public Health Emergency Rapid Response Teams
- (c) Update other logistics like vehicles, fuel, phone cards etc.
- (d) Update list of trained health staff including laboratory staff.
- (e) Map laboratories that have sufficient quality control standards and meet the required standards to ensure reliable results, including availability of SOP which defines biosafety procedures for collecting, packaging, labelling, shipping, manipulating and discarding samples. Map also the specimen referral/transportation network including schedules; and where such networks are non-existent, create the mechanism to ensure prompt referral of specimens once an outbreak is suspected.
- (f) Map and update isolation wards for the management of patients with highly infectious diseases including contact details, location, bed capacity, level of expertise, and type of patients/diseases that can be treated.
- (g) Develop a patient referral system for highly infectious diseases, including transportation mechanisms.
- (h) Take stock of risk communication SOPs at the different levels.

5.8 Annexes to 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		Lab: See Annex 4b
Ribavirin	Bromadiolone			Lamps
Ringer lactate				Maps
Oseltamivir				Kerosene
				Phones
				Plastic sheets
				Power generator
				Radio
				Sprayers

NB: Detailed list also available in Annex 4B

Annex 5B: Stock situation report

Title, name and function of responsible officer:

Annex 5C: IDSR stock item transaction and balance sheet

IDSR Stock Item Transaction and Balance Sheet										
Laboratory or Warehouse Name	Item Description (Name)	Presentation (Unit of purchase)	Expiry date	Manufacturer	Batch number	Location in store	Airway bill	Allotment number	Shipment & operations cost (USD)	Transaction Date (Day/Month/Year)
										0

Use one sheet by stock item, and update the sheet every time any transaction takes place

Use one sheet by stock item, and update the sheet every time any transaction takes place

Annex 5D: Assignments for the committee to develop the EPR plan

Task	Assigned member(s) from the committee
Designated coordination structures, including committees	
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 (antiviral, antimicrobial, decontamination, disinfection or others as indicated), infection control, isolation facilities, management of a mass casualty event	
Pre- and post-exposure prophylaxis treatment	
Immunization strategies	
Rapid containment activities and additional methods if rapid containment fails	
Psychosocial support for all affected, including community members and responders	
Risk communication and social 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	

5.9 References

1. Geneva: World Health Organization; 2012 (WHO/HSE/GAR/ARO/2012.1; http://whqlibdoc.who.int/hq/2012/WHO_HSE_GAR_ARO_2012.1_eng.pdf, accessed June 2017).
2. Operational guidance on rapid risk assessment methodology. Stockholm: ECDC; 2011 (http://ecdc.europa.eu/en/publications/Publications/1108_TED_Risk_Assessment_Methodology_Guidance.pdf, accessed June 2017).
3. Standard Operating Procedures for AFRO Strategic Health Operations Centre (AFRO SHOC). Disease Surveillance and Response Programme Area. Disease Prevention and Control Cluster, December 2014
4. WHO African Regional strategy for health security and emergencies 2016–2020

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES

THIRD EDITION



SECTION 6: RESPOND TO OUTBREAKS AND PUBLIC HEALTH EVENTS

MARCH 2019

SECTION 6: RESPOND TO OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

6. OVERVIEW ON HOW TO RESPOND TO OUTBREAKS AND OTHER PUBLIC HEALTH EVENTS

The goal of integrated disease surveillance and response is to use data for public health response or action. This section describes steps for declaring an outbreak and activating the response structures, conducting a public health response and providing general directions for immediate response actions targeting the leading causes of illness, death and disability. Consult the relevant WHO guideline at the end of this section for the response to chemical, biological and radio-nuclear events.

When an outbreak, acute public health event or condition is detected, an investigation should be conducted to determine its cause as described in 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 antimalarial, antibiotic or antiviral treatments as indicated. Successful responses are carried out with community involvement and often include a community education and behaviour change component.

Effective coordination of response activities is also critical, as many actors/stakeholders will be involved. It is essential that all actors/stakeholders be identified in advance, including their areas of support, roles and responsibilities to enable smooth response during an epidemic or any other public health event. This is the role of the PHEMC (defined in Section 5) which through activation of the PHEOC will ensure the effective coordination of response activities across different sectors and donors (as discussed in Section 5).

Regardless of the specific recommended response, the nation or region or district's role in selecting and implementing a recommended response is essential for safeguarding the health and well-being of communities at the respective levels.

Under the International Health Regulations (IHR, 2005), districts 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 district level, the Head of the District Health Management Team should notify the region and subsequently the national level (responsible National Public Health Authority (NPHA)). Depending on the event, at the national level, the NPHA, and the IHR NFP will assess whether the event is a potential public health event of international concern (PHEIC) using the International Health Regulations (IHR) decision instrument. The NFP will liaise with the Chief Medical Officer /Director General within the Ministry of Health, to notify the WHO IHR AFRO Office. They will then alert the nearby districts (and provinces or regions where applicable) about the outbreak to ensure that there is coordination of response efforts. While waiting for confirmation of the laboratory diagnosis, there may be a declaration of an outbreak by the Minister of Health or the competent sector ministry.

6.2 Mobilize Public Health Emergency Rapid Response Teams (PHERRT) for immediate action

The Public Health Emergency Rapid Response Teams (PHERRT) would have already been identified during preparedness activities. Mobilize the teams and make sure that their membership reflects the technical needs of the response. Refer to Section 5 of these guidelines for recommendations on the composition as well as the roles and responsibilities of the rapid response team.

6.2.1 Convene the District Public Health Emergency Management committee (PHEMC)

Once an outbreak or event is confirmed, the District Health Management Team (DHMT) will work with the District Appointed Government Administrator to convene the PHEMC to assess and implement the response. They will also activate the IMS (see Section 5). The following further steps should be taken:

- (a) Request the release of outbreak or event response funds.
- (b) Alert neighbouring districts within and outside the country about the outbreak. If they are reporting a similar outbreak, coordinate response efforts with them. If there is an already established cross-border surveillance and response framework with a neighbouring country, then inform the neighbouring district in that country. If not, the IHR NFP must communicate with the neighbouring NFP to notify them of the public health event. This will facilitate coordination of the response to the public health event and curb the spread of the disease beyond the catchment area.

- (c) Assign clear responsibilities for specific response activities to lead the technical committee. They will also review the IMS team to ensure that it is adequately composed; i.e., has all the technical and non-technical members (See Section 5).
- (d) Provide orientation or training along with an adequate stock of relevant supplies for the district response team and affected health facility staff.
- (e) Review existing resources as defined in the preparedness plan and determine what additional resources are required.
For example, consider:
 - (i) the human resources that could be mobilized to manage the epidemic;
 - (ii) funds to support response activities; and
 - (iii) other logistical support; e.g., vehicles and fuel, phones.
- (f) Request emergency stocks or personal protective equipment (PPE), disinfection and required medicines and other medical supplies such as specimen transport kits.
- (g) Provide laboratory or diagnostic support for confirmation of pathogens responsible for the epidemics. If the district does not have the capacity to safely collect, package and ship the specimen, contact the reference laboratory for assistance. For laboratories where referral of specimen is a challenge, consider using rapid diagnostic kits or any other point-of-care (PoC) diagnostics, if available.
- (h) Mobilize logistical support (travel of rapid response team, accommodation arrangements, communication, other essential equipment) for the district and community levels.
- (i) If supplies are not available locally:
 - (i) contact the regional/provincial or central levels to request alternate suppliers;
 - (ii) collaborate with other services, activities or nongovernmental organizations or private pharmacies/laboratories in your area; and
 - (iii) identify practical low-cost substitutes.
- (j) Ensure clear lines of communication and appoint a spokesperson

6.3 Select and implement appropriate public health response activities

Review investigation results and data analysis interpretation provided by Public Health Emergency Rapid Response Team (PHERRT) to select appropriate response activities that would contain the confirmed outbreak or public health event. Regardless of the specific causes of the outbreak or event, the success of the response depends on activation of the IMS and implementation of intervention strategies such as:

- (a) overall coordination;
- (b) case management as well as infection, prevention and control (IPC);

- (c) logistics and supply chain management;
- (d) laboratory or diagnostic surveillance and epidemiology;
- (e) social mobilization and risk communication;
- (f) reactive vaccination;
- (g) water, sanitation and hygiene (WASH); and
- (h) vector control.

Refer to Section 11.0 and national disease-specific guidelines to select response activities, which involve:

- (a) proven measures to prevent unnecessary deaths or disabilities due to the specific cause of the problem;
- (b) a mix of activities for immediate control of the problem in the short-term and reduction of the risk of ongoing transmission in the long-term through prevention activities;
- (c) participation from the community, health care facilities and the district personnel; and
- (d) participation of other key stakeholders from private organizations, business entities, traditional healers, food vendor associations and others who might influence the response activities.

Response activities for particular outbreaks or public health problems or events may include the following:

- (a) perform case management;
- (b) conduct emergency vaccination campaigns, when recommended for humans or animals;
- (c) provide relevant chemoprophylaxis and vaccination for health workers;
- (d) improve access to clean water;
- (e) improve safe disposal of human and animal waste;
- (f) improve food-handling practices;
- (g) reduce exposure to mosquitoes and other vectors;
- (h) control vectors;
- (i) involve other experts (socio anthropologist, social scientist);
- (j) enhance specific surveillance measures at point of entry;
- (k) enhance social mobilization and behavioural change activities; and
- (l) strengthen media and public communication (press, radio, TV, social media, etc.).

Implementing a response means executing the operational steps so that the actions are carried out as planned. Regardless of the specific causes of the outbreak or event, the success of the response depends on the success of general factors such as management (treatment and monitoring of patients for adverse events particularly if experimental medicines or vaccines are used) and appropriate IPC, provision of supplies and availability of trained health staff.

The selected activities for responding to outbreaks or public health events include the following:

- (a) strengthen case management and infection prevention and control measures;
- (b) build the capacity of response staff;
- (c) enhance surveillance during the response;
- (d) enhance surveillance in neighbouring border district;
- (e) engage the community during the response;
- (f) inform and educate the community;
- (g) conduct a mass vaccination campaign;
- (h) improve access to clean and safe water;
- (i) ensure safe disposal of infectious waste;
- (j) improve food-handling practices;
- (k) reduce exposure to infectious or environmental hazards;
- (l) ensure safe and dignified burial and handling of dead bodies; and
- (m) ensure appropriate and adequate logistics and supplies.

6.3.1 Strengthen case management and infection prevention and control (IPC) measures

Take steps to support improved clinical practices in the district. Review the recommendations in Annex 6A and Section 11.0 for treating cases of different diseases during an outbreak.

- (a) Train and equip health workers at the district level to implement these measures.
- (b) Ensure that clinicians receive laboratory confirmation results where necessary.
- (c) Ensure that health workers record all patients in a recognizable standardized register and a line list.
- (d) Ask the officer-in-charge at each health facility to identify an area that can be used to accommodate a large number of patients during epidemics involving a large number of cases.
- (e) Provide standard operating procedures (SOPs) that include IPC guidelines.

- (f) Implement IPC and risk mitigation measures such as:
 - (i) establish triage and isolation wards for highly infectious diseases (Ebola, cholera, SARS, etc.). See Annex 6H for cholera treatment centre;
 - (ii) ensure that health staff have access to safety and personal protective equipment for any infectious diseases (especially for Ebola and SARS);
 - (iii) ensure that there are safe practices and protection of non-health workers (supporting staff, e.g. security, cleaners, administrative staff);
 - (iv) assess and assure WASH standards for health facilities;
 - (v) provide oversight about disposal of PPE and other contaminated supplies; and
 - (vi) ensure appropriate biosafety and biosecurity for animals (farms, markets, etc.).
- (g) Ensure that the necessary medicines and treatment supplies are available.
- (h) Ensure that the proper treatment protocols are available.
 - (i) Review the standard operating procedures for the referral system;
 - (ii) Ensure that a proper discharge protocol of cases linked to social workers is available.

6.3.2 Build the capacity of response staff

Provide relevant capacity-building opportunities for response staff on the outbreak or event case definition, case management procedures, reporting process and required data elements. It is essential that members of the PHERRT are aware of and have access to any indicated personal protection equipment and IPC practices relevant for the disease targeted by the response. If there are immunization requirements for responding to the particular disease or condition, ensure that members of PHERRT are protected with the required vaccines.

To reinforce the skills of response staff:

- (a) Give clear and concise directions to health workers and other staff participating in the response.
- (b) Select topics for orientation or training. Emphasize case management and infection prevention and control for the specific disease according to disease-specific recommendations. Select other training topics depending on the risk of exposure to the specific public health hazard, for example:
 - (i) case management protocols for cases;
 - (ii) enhancing standard precautions (use of clean water, hand-washing and safe disposal of sharps);
 - (iii) barrier nursing and use of protective clothing;
 - (iv) isolation precautions;

- (v) treatment protocols such as delivering oral rehydration salts (ORS) and using intravenous fluids;
- (vi) disinfecting surfaces, clothing and equipment;
- (vii) safe disposal of bodies and dignified burials;
- (viii) safe disposal of animal carcasses;
- (ix) others which may seem necessary and may include client-patient interactions and counselling skills, orientation on how health worker would interact with CBS focal persons etc.

(c) Conduct orientation and training

- (i) Orient or reorient the district PHEMC, public health rapid response team and other health and non-health personnel on epidemic management based on the current epidemic.
- (ii) In an urgent situation, there often is not time for formal training. Provide on-the-job training as needed. Make sure there is an opportunity for the training physician or nursing staff to observe the trainees using the updated or new skill.
- (iii) Monitor participant performance and review skills as needed.

6.3.3 Enhance surveillance during the response

During a response to an outbreak, health staff at all health facilities must be vigilant in surveillance of the disease, condition or events, by liaising with the community health worker or any person identified as community focal person. For example, members of the response teams and health staff in affected facilities should:

- (a) search for additional persons who have the specific disease and refer them to the health facility or treatment centres, or if necessary, quarantine the household and manage the patient, ensuring that they have access to consistent/adequate food, water, and non-food items (i.e. soap, chlorine, firewood, medicines, sanitary pads, etc.);
- (b) ensure timely provision of laboratory information to the team;
- (c) update the line list, make data analysis by time (epi curve), person (age and sex) and place (mapping of cases);
- (d) ensure timely provision of laboratory information to the team;
- (e) update the line list, make data analysis by time (epi curve), person (age and sex) and place (mapping of cases);
- (f) monitor the effectiveness of the outbreak response activity;
- (g) report daily at the beginning of the epidemic; once the epidemic progresses, the District PHEMC can decide on a different frequency of reporting;
- (h) actively trace and follow up contacts as indicated (See Section 4 for how to do contact tracing);

- (i) monitor the effectiveness of the outbreak response activity;
- (j) report daily at the beginning of the epidemic; once the epidemic progresses, the district public health emergency preparedness and response (PHEPR) committee can decide on a different frequency of reporting;
- (k) actively trace and follow up contacts as indicated (See Section 4 for how to do contact tracing).

6.3.4 Enhance surveillance with neighbouring border districts

During response, it is important also to work closely with neighbouring districts to ensure that the outbreak does not spill to another district. It is important to share information and also plan for joint surveillance and response activities.

Initiate the establishment of the cross-border disease surveillance and response committees to provide a platform for sharing surveillance data, epidemiological and other related information during the outbreak. The committee should have members from both neighbouring districts and its composition should include at least:

- (a) the focal person responsible for IDSR;
- (b) the focal person responsible for laboratory services;
- (c) the medical officer of health;
- (d) the focal person responsible for environmental health;
- (e) the focal person responsible for clinical services; and
- (f) the focal person responsible for animal (domestic and/or wildlife) health, local immigration officials and the local district commissioner.

The committee can also coopt other members depending on the disease profile and the disease outbreak/public health emergency being handled.

The committee will meet as soon as a public health emergency is identified and then weekly or fortnightly as it continues. It will continue to hold routine quarterly meetings during the inter-epidemic period to review disease trends, other early warning systems and its district's level of preparedness.

6.3.5 Engage community during response

Community-based surveillance focal persons (See definition in the Introduction section) can be the first responders and take steps to make the situation as safe as possible for the community. Some of the actions include the following:

- (a) Engage and inform community leaders with information on the situation and actions that can be taken to mitigate the situation.
- (b) Provide first aid and call or send for medical help.
- (c) Keep people away from a ‘risk’ area (potentially contaminated water source).
- (d) Respectfully isolate anyone with a potentially infectious disease paying particular attention to cultural sensitivities.
- (e) Quarantine for animals, market closures, etc.
- (f) Provide community education including specific actions the community can take to protect themselves.
- (g) Engage in IPC and hygiene promotion in coordination with any efforts at strengthening the availability of materials/infrastructure for IPC and hygiene.
- (h) Identify local effective channels for delivery of the information to the community
- (i) Organize door-to-door campaigns using trusted individuals to reach every household within the catchment area in order to curb the spread of the public health event and to encourage self-reporting, treatment and health-seeking behaviour among people who have had contact with the public health event or are suspected to be public health event cases
- (j) Engage community members as stakeholders and problem solvers, not merely beneficiaries.

6.3.6 Inform and educate the community

Effective risk communication is an essential element of managing public health events. It is a crosscutting activity that can impact other technical areas of the response such as WASH, vaccination, community surveillance, etc. It is also essential to create trust between first responders and the community. When the public is at risk of a real or potential health threat, treatment options may be limited, direct interventions may take time to organize, and resources may be few. Communicating advice and guidance, therefore, may be the most important public health tool in managing a risk.

Keep the public informed to calm their fears and encourage cooperation with the response efforts. Develop community education messages with information about recognizing the illness, how to prevent transmission and when to seek treatment. Begin communication activities with the community as soon as an epidemic or public health problem is identified. Identify community groups or local NGO or outreach teams that can help gather information and amplify the messages. Ensure consistency in content of messaging between all messengers (community leaders, health care personnel, religious leaders, etc.).

The following should be considered for effective risk communication:

- (a) Decide what to communicate by referring to disease-specific recommendations in Section 11.0. Make sure to include:
 - (i) signs and symptoms of the disease;
 - (ii) how to treat the disease at home, if home treatment is recommended and how to prepare disinfectant solutions;
 - (iii) prevention behaviours that are feasible and that have a high likelihood of preventing disease transmission;
 - (iv) when to come to the health facility for evaluation and treatment;
 - (v) immunization recommendations, if any.

At the same time, maintain active processes for collecting qualitative information needed to establish and address any circulating rumours.

- (b) Decide how to state the message. Make sure that the messages:
 - (i) use local terminology;
 - (ii) are culturally sensitive and acceptable;
 - (iii) are clear and concise;
 - (iv) consider local traditions;
 - (v) address beliefs about the disease.
- NB: Consider pre-testing the messages from similar settings before dissemination.
Sample community education messages are found in Annex 6F at the end of this section.
- (c) Select the appropriate communication methods available in your district. For example:
 - (i) mass media, (radio, television, newspapers);
 - (ii) meetings (health personnel, community, religious, opinion and political leaders);
 - (iii) educational and communication materials (posters, fliers);
 - (iv) multimedia presentations (e.g., films, video or narrated slide presentations) at the markets, health centres, schools, women's and other community groups, service organizations, religious centres;
 - (v) social media (Facebook, Twitter, WhatsApp, etc.);

- (vi) community drama groups/play groups;
 - (vii) public address system;
 - (viii) corporate/ institutional website;
 - (ix) e-mail/ SMS subscriptions.
- (d) Give health education messages to community groups and service organizations and ask that they disseminate them during their meetings.
 - (e) Give health education messages to trusted and respected community leaders and ask them to transmit to the community.
 - (i) Designated person from the MoH should serve as spokesperson to the media. Tell the media the name of the spokesperson, and that all information about the outbreak will be provided by the spokesperson.
 - (ii) Release information to the media only through the spokesperson to make sure that the community receives clear and consistent information.
 - (f) On a regular basis, district and regional medical officers will meet with local leaders to give:
 - (i) frequent, up-to-date information on the outbreak and response;
 - (ii) clear and simple health messages for the media;
 - (iii) clear instructions to communicate to the media the information and health education messages from the PHEMC.

6.3.7 Conduct a mass vaccination campaign

Collaborate with the national immunization and disease prevention control (IVD) 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 vaccines.

Determine the target population for the activity based on the case and outbreak investigation results (see the IVD program guidelines for specific recommendations about delivery of the indicated vaccines).

Two worksheets entitled “Planning a mass vaccination campaign” and “Estimating vaccine supplies for vaccination activities” are found at the end of this section in Annexes 6C and 6D respectively. Meanwhile, Annex 6E describes the recommended vaccination practices for 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. Make sure the community has an adequate supply of clean and safe water for drinking and other uses. The daily water needs per person during non-outbreak situations are presented below. Water needs are much higher during an outbreak situation, especially outbreaks of diarrhoeal diseases.

Table 6.1: Basic Water Quantity Needs

Daily water needs per person*		
	Non-outbreak situation	During outbreak of diarrhoeal disease
Home use	20 litres per day	50 litres
Health care setting	40 to 60 litres per day	50 litres in wards, 100 litres in surgery 10 litres in kitchen

**Refugee Health: An Approach to Emergency Situations, Médecins sans Frontières, 1997 MacMillan

Safe drinking water includes:

- (a) piped chlorinated water;
- (b) safe drinking water obtained through chlorination at point-of-use;
- (c) water obtained from protected sources (such as wells closed with a cover, rainwater collected in a clean container);
- (d) boiled water from any source.

If no local safe water sources are available during an emergency, water may need to be brought from outside. To ensure that families have *safe and clean drinking water at home* (even if the source is safe) do the following:

- (a) Provide community education on how to keep home drinking water safe. Refer to Annex 6F for sample community messages and references to specific prevention guidelines for preparing safe water at home.
- (b) Provide containers that prevent water contamination. For example, containers with narrow openings are ideal because users would not be able to contaminate the water by putting their hands into the container.
- (c) Ensure that waste disposal sites, including for faeces, are located at least 30 metres away from water sources.

6.3.9 Ensure safe disposal of infectious waste

To ensure the safe disposal of human excreta in order to avoid secondary infections due to contact with contaminated substances:

- (a) Assign teams to inspect local areas for human and animal waste disposal. Safe practices include disposing of faeces in a latrine or burying them in the ground more than 10 metres from water supply.
- (b) If unsafe practices are found such as open defecation, educate the community on safe disposal of such waste. Construct latrines appropriate for local conditions with the cooperation of the community.
- (c) Conduct effective community education on sanitation practices.

6.3.10 Improve food-handling practices

Make sure that people handle food safely at home, in restaurants, at food vending settings and in factories. Refer to the established national standards and controls for the handling and processing of food.

To ensure food hygiene:

- (a) conduct community education on food hygiene practices for the general public and those in the food industry;
- (b) visit restaurants, food vendors, food packaging factories and other venues to inspect food-handling practices, focusing on safe practices such as proper hand-washing, cleanliness and adherence to national standards;
- (c) close restaurants, vending areas or factories if inspection results show unsafe food-handling practices;
- (d) strengthen national controls for food safety as necessary.

6.3.11 Reduce exposure to infectious or environmental hazards

As indicated by the outbreak or event, take action to reduce exposure to hazards or factors contributing to the outbreak or event. This may involve chemical, physical or biological agents. Technical requirements for reducing exposure will be determined according to national policy and through collaboration with those who have experience in these areas. For example, occupational or industrial exposure to heavy metals (e.g., lead) will require coordination with multiple ministries and partners. Community education and behaviour change interventions

can help the community to effect changes that will limit exposure to dangerous levels of chemicals and other hazards.

For vector-borne diseases, engage the service of experts such as an entomologist in designing appropriate interventions that will reduce exposure to offending vectors (e.g., Anopheles mosquito). Work with the malaria control program in your district to:

- (a) promote indoor residual spraying;
- (b) conduct community education on the proper use of bed nets and the avoidance of dusk-to-dawn mosquito bites;
- (c) promote the use of locally available ITNs and other insecticide-treated materials (bed nets, blankets, clothes, sheets, curtains, etc.);
- (d) encourage environmental cleanliness (e.g., draining stagnant water, clearing bushes etc.).

Encourage the prevention of *diseases transmitted by rodents* by helping people in your district 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 district to encourage the community to:

- (a) avoid contact with rodents and their urine, droppings and other secretions;
- (b) keep food and water in the home covered to prevent contamination by rodents;
- (c) keep the home and cooking area clean and tidy to reduce the possibility of rodents nesting in the room;
- (d) use chemicals (insecticides, rodenticides, larvicides etc.) and traps as appropriate based on environmental and entomological assessment;
- (e) educate the community on personal protection to reduce exposure.

6.3.12 Ensure the safe and dignified handling and burial of dead bodies

Dead body management is crucial in combating the spread of infectious diseases both in case detection and surveillance as well as in the management of potentially infectious material. VHF, cholera and unexplained deaths in suspicious circumstances are situations that require the careful handling of bodies. It is also essential to ensure the safe and dignified disposal of bodies by trained personnel, given the infectious nature of epidemic-prone diseases. The disinfection or decontamination of homes and hospital wards (where people have died of an infectious disease) should be implemented.

A guide should be prepared on the proper disinfection or decontamination of homes and hospitals where there have been corpses of persons who died from a suspected infectious disease.

Dead body management guidelines currently distinguish between high and low priority/risk bodies and rely on trained teams. Deaths that are considered high-risk may be treated as a form of surveillance and case detection for VHF or possibly other conditions when relevant testing capabilities are available.

Safe burials can be conducted in the community at approved burial sites at the discretion of the families. The Public Health Emergency Management Committee (PHEMC) may be directed to develop a safe and dignified burial contingency plan when an infectious disease outbreak occurs and such plan will be reviewed periodically to adapt to the evolution of the epidemic.

6.3.13 Ensure appropriate and adequate logistics and supplies

A dedicated logistic team is needed during an outbreak response.

Throughout the outbreak, monitor the effectiveness of the logistics system and delivery of essential supplies and materials. Carry out logistical planning to make sure transport is used in the most efficient ways. Monitor the reliability of communication between teams during the outbreak and if additional equipment is needed (e.g., additional airtime top-up for mobile phones), take action to provide teams what they need to carry out the response actions.

Monitoring the management of the outbreak or event is crucial to outbreak control. The monitoring results are important for they will be included in the response report submitted to the supervisory levels and to community leaders and needed for future advocacy.

For example, make sure there is ongoing monitoring of:

- (a) disease trends to assess the effectiveness of the response measures, the scope of the epidemic and risk factors;
- (b) the effectiveness of the response: case fatality rate, incidence;
- (c) implementation of the response: program coverage, meetings of the epidemic management committee, etc.;
- (d) availability and use of adequate resources, supplies and equipment;
- (e) community acceptability of response efforts;
- (f) 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 (See Annex 6G). Provide information developed by the PHEMC to the affected communities and health facilities. In the situation updates, provide information such as:

- (a) details on response activities, including dates, places and individuals involved in each activity, as well as the “Epi” curve, spot map, table of person analyses, and the line list of cases;
- (b) any changes made since the last report;
- (c) effectiveness of the response: case fatality rate, incidence;
- (d) implementation of the response of the EPR committee etc.;
- (e) operational challenges and gaps;
- (f) recommended changes to improve future epidemic response such as a vaccination strategy to enhance immunization or a transportation procedure to ensure that specimens reach the reference laboratory quickly and in good condition.

The situation reports will be an important reference for evaluating the response and developing a final report. A suggested format of the report is in Annex 7A of Section 7. Steps for monitoring and evaluating a response are presented in Section 8.

6.5 Document the response

During and at the end of an outbreak, the district health management team should:

- (a) collect all the documents including minutes of any meeting, activity or process; epidemic reports; evaluation reports; and other relevant documents;
- (b) prepare a coversheet listing of all the above documents;
- (c) document lessons learnt and recommended improvements and accordingly update the country EPR plan, event/disease-specific plan and other relevant SOPs and tools, where appropriate (After-Action Review — AAR).

This will become an essential source of data for evaluating the response. See Section 8, on how to monitor, evaluate, supervise and provide feedback on IDSR activities.

6.6 Annexes to Section 6

- Annex 6A** Treating 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
 - 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: Treating cases during an outbreak

Use appropriate medicines and treatments for managing cases during an outbreak. Below are treatment recommendations for use in an outbreak situation for:

- (a) cholera;
- (b) dysentery;
- (c) measles; and
- (d) bacterial meningitis.

Note: For detailed treatment guidelines of these and other diseases of priority concern, please refer to the specific disease guidelines.

1. Treating cholera in an outbreak situation

Source: WHO guidelines for management of the patient with cholera, WHO/CDD/SER/91.15 and The New Emergency Health Kit 98, WHO/DAP/98.10

- (a) Assess the patient for signs of dehydration. see assessment guide below.
- (b) Give fluids according to the appropriate treatment plan (see next page).
- (c) Collect a stool specimen from the first five suspected cholera patients seen.
- (d) Give an oral antibiotic to patients with severe dehydration.

Assess the patient for signs of dehydration

- Look at patient's general condition: Is the patient lethargic, restless and irritable or unconscious?
- Are the patient's eyes sunken?
- Offer the patient fluid. Is the patient: not able to drink, or drinking poorly, drinking eagerly, thirsty?
- Pinch the skin of the abdomen. Does it go back very slowly (longer than 2 seconds?) or slowly?

Decide if the patient has severe, some, or no signs of dehydration, and give extra fluid according to the treatment plan

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:

SOME DEHYDRATION

- restless, irritable
- sunken eyes (Give fluid according to "for some dehydration")
- drinks eagerly, thirsty (Plan B)
- skin pinch goes back slowly

If there are not enough signs to classify as some or severe dehydration

NO DEHYDRATION

Give fluid and food to treat diarrhoea at home. (Plan A)

Plan C: Intravenous therapy for severe dehydration

- (a) Severe dehydration is a medical emergency and patients must be treated urgently. Seconds can make a difference.
- (b) Patients with severe dehydration should start intravenous fluids (IV) immediately.
- (c) As soon as the patient can drink, also give ORS solution 5ml/kg/hour simultaneously.
- (d) Ringer's lactate is the first choice out of all the IV fluids. If Ringer's lactate is not available other sterile solutions can be an alternative:
 - (i) normal saline;
 - (ii) 5% glucose in normal saline;
 - (iii) cholera saline (containing Na^+ , 133; K^+ , 20; Cl^- , 98; acetate, 48 mmol/L).
- (e) Plain 5% glucose (dextrose) solution is not recommended.
- (f) Give a total of 100 ml/kg Ringer's Lactate Solution divided into two periods as indicated below:

Age	First period	Second period	Total
< 1 year	30 ml/kg in 1 hour	70ml/kg in 5 hours	100 ml/kg in 6 hours
\geq 1 year and adults	30 ml/kg in 30 min	70 ml/kg in 2 $^{1/2}$ hours	100 ml/kg in 3 hours

- (a) More than one IV line may be necessary to give the first bolus treatment.
- (b) When IV rehydration is not possible and the patient can't drink, ORS solution can be given by nasogastric tube.
 - Do not use nasogastric tubes for patients who are unconscious or vomiting.
- (c) When possible, fluid output should be measured and equivalent volumes added to the amount described for initial treatment.
- (d) Monitor the patient closely and perform frequent reassessment (every 15-30 min).
- (e) If hydration is not improving, give the IV drip more rapidly. 200ml/kg or more may be needed during the first 24 hours of treatment.
- (f) After 6 hours (infants) or 3 hours (older patients), perform a full reassessment. Switch to ORS solution if hydration is improved and the patient can drink.

Complications – pulmonary oedema can occur if excessive IV fluid has been given; renal failure if too little IV fluid is given; and hypoglycaemia and hypokalaemia in children with malnutrition rehydrated with Ringer lactate only. Rehydration must be closely monitored by the medical staff.

Antibiotic treatment

- (g) The laboratory should be asked about patterns of resistance of the strain at the beginning of and during the outbreak and adapt the treatment accordingly.
- (h) Antibiotics should be given only in severe cases, to reduce the duration of symptoms and carriage of the pathogen.
- (i) Antibiotics are given as soon as the patient is able to take oral medication (once vomiting has stopped):
 - (i) Doxycycline: single dose (300mg for adults; 2-4 mg/kg for a child between 1 and 14 years of age), is antibiotic of choice for all patients, including pregnant women.
 - (ii) If there is resistance to doxycycline, use azithromycin (1 g orally as a single dose for adults and 20 mg/kg (max 1g)) orally as a single dose for children < 12 years.

	First-line	Alternative
Adults (including pregnant women)	Doxycycline 300 mg as a single dose	Azithromycin PO 1g as a single dose
Children < 12 years old	Doxycycline 2-4 mg/kg single dose	Azithromycin PO 20mg/kg single dose
Zinc supplementation for children		
Zinc supplementation in the management of children 6 months to 5 years with watery diarrhoea reduces the frequency and severity of the episode as well as the frequency of subsequent diarrhoea. When available, supplementation (20 mg zinc per day) should be started immediately		

Plan B: Oral rehydration for patients with some dehydration

- (a) Patients presenting with some signs of dehydration must be admitted to the CTC/CTU.
- (b) Initial treatment, give ORS according the weight of the patient (75ml/kg in the first 4 hours).
- (c) Cholera patients with some signs of dehydration do not need IV fluid replacement, but they need to be monitored closely during the first 4 hours:
 - (i) If at any time signs of severe dehydration appear then shift immediately to Treatment Plan C.
 - (ii) If there are still some signs of dehydration after the first 4 hours, repeat Treatment Plan B for 4 hours and reassess.
 - (iii) If there are no signs of dehydration after the first 4 hours of treatment, then patients can be sent home with the same instructions described above under Treatment Plan A.
- (d) If the patient vomits while taking fluid, wait 10 minutes. Then allow the patient to resume feeding, but more slowly.
- (e) Continue monitoring the patient and replacing fluid until the diarrhoea stops.
- (f) When the patient is ready to leave the facility, counsel the patient on treating diarrhoea at home.
- (g) Refer to IMCI guidelines for treating children under 5 years of age and to national guidelines for further information on treating acute watery diarrhoea and confirmed cholera.

Plan A: Oral rehydration for patients with no signs of dehydration

- (a) Patients with no signs of dehydration should be treated with oral rehydration solution (ORS).
- (b) There is no need to admit the patients with no signs of dehydration to the CTU/CTC. They can be treated with ORS at home, at ORPs or at the outpatient area at the health facility.
- (c) If patient is seen at the health facility, keep the patient for observation for 2-4 hours to ensure they are tolerating ORS.
- (d) During observation and before sending home, provide clear instructions for care. Advise patients or caregivers to continue giving ORS after each loose stool and to come back immediately if condition deteriorates (repeated vomiting, number of stools increased or if the patient is drinking or eating poorly).
- (e) ORS must be prepared with safe water (boiled or treated with a chlorine product or household bleach). It should not be stored for more than 24 hours (make fresh daily).
- (f) ORS should be given regularly, in small amounts. If a patient vomits ORS, slow the administration of ORS and then slowly increase again when vomiting stops.
- (g) Patients should receive ORS after each loose stool to maintain hydration until diarrhoea stops.
- (h) Patients should receive the following amounts of ORS following each loose stool:

Age	Quantity of ORS
<2 years	50–100 ml
2–9 years	100–200 ml
≥10 years	as much as wanted

Discharge

- (a) Consider 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.
- (b) Prior to discharge, provide patients and their carers with ORS and instructions on how to prepare it.
- (c) Inform patient, family members and carers about precautions and instructions at household level:
 - For children, continue breastfeeding of infants and young children.
 - Drink and use safe water.
 - Wash hands at critical times including after using a toilet (including helping a child) and before preparing and eating food. If caring for a patient, always wash hands after providing care and after handling any soiled items such as clothes or linens.
 - Cook food thoroughly and eat it while it is still hot.
 - Remove and wash any bedding or clothing that may have had contact with diarrhoeal stool with the appropriate chlorine solution (0.02%). If chlorine is not available, patients' bedding and clothing can be disinfected by stirring them for 5 minutes in boiling water and drying in direct sunlight, or by washing with soap and drying it thoroughly in direct sunlight.
 - Use a flush toilet or approved septic system; double bag soiled materials when discarding in trash.
 - Use any household disinfectant or a 1:10 dilution of bleach solution (1 part bleach to 9 parts water) to clean any area that may have contact with faecal matter, as soon as possible after being soiled.
 - If a household member develops acute, watery diarrhoea, administer oral rehydration solution (ORS) and seek health care immediately.
 - While caring for persons who are ill with cholera, do not serve food or drink to persons who are not household members.
 - Visitors can be allowed if the ill person wants company; visitors should also observe hand hygiene recommendation.
 - Give patients information about home care before they leave the health facility on danger signs and when to return to the facility again. Patients should return for treatment if they develop any of the following:
 - increased number of watery stools;
 - eating or drinking poorly;
 - marked thirst;
 - repeated vomiting;
 - fever;
 - blood in the stool.

(a) Give an appropriate oral antibiotic for outbreaks of bloody diarrhoea due to *Shigella dysenteriae* type

	NALIDIXIC ACID # Give four times daily for 5 days	CIPROFLOXACIN #Give two times daily for 5 days	COTRIMOXAZOLE (trimethoprim + sulphamethoxazole) # Give two times daily for 5 days		
WEIGHT	TABLET 250 mg	TABLET 250 mg	ADULT TABLET 80 mg trimethoprim + 400 mg sulphamethoxazole	PAEDIATRIC TABLET 20 mg trimethoprim + 100 mg sulphamethoxazole	SYRUP 40 mg trimethoprim + 200 mg sulphamethoxazole per 5 ml
<i>Children's dose</i>					
3–5 kg	¼	¼	¼	2	5 ml
6–9 kg	½	½	½	2	5 ml
10–14 kg	1	1	1	3	7.5 ml
15–19 kg	1	1	1	3	7.5 ml
20–29 kg	2	2	1	6	15 ml
<i>Adult dose</i>	TABLET 250 mg	TABLET 250 mg	TABLET 160 mg TMP +800 mg SMX		
	4 tablets	4 tablets	2 tablets		

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

Give vitamin A to children with measles

- (a) Give the first dose in the health facility or clinic.
- (b) Give the mother one dose to give at home the next day.

AGE	Vitamin A Capsules		
	200 000 IU	100 000 IU	50 000 IU
Up to 6 months		½ capsule	1 capsule
6 months up to 12 months	½ capsule	1 capsule	2 capsules
12 months up to 5 years	1 capsule	2 capsules	4 capsules

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

(b) Give appropriate antibiotic for bacterial meningitis cases during and outside an outbreak

Sources:

Managing meningitis epidemics in Africa: A quick reference guide for health authorities and health-care workers Revised 2015, WHO/HSE/GAR/ERI/2010.4. Rev.

Meningitis outbreak response in sub-Saharan Africa. WHO guideline, WHO/HSE/PED/CED/14.5

Weekly Epidemiological Record No 51/52, 577-588, 19 December 2014(<http://www.who.int/wer>)

Standard Operating Procedures for Surveillance of Meningitis, Preparedness and Response to Epidemics in Africa, WHO document. WHO/AFRO/FRH October 2018, Brazzaville

1. Admit patient to a health facility for diagnosis and treatment.
2. Following lumbar puncture, treat every new patient who is suspected of having meningitis with antibiotics as soon as possible; Ceftriaxone is the first line treatment for bacterial meningitis (Treatment protocols in the table below).
3. Ensure any child under 2 years of age or any patient with severe symptoms is admitted to the health centre for inpatient treatment and adjust the treatment as necessary.
4. Patient isolation is not necessary. Provide good supportive care and simplify case management.

Age	Treatment protocols for bacterial meningitis during epidemics in Africa (without laboratory confirmation)
In children aged 0–2 months	Ceftriaxone 100mg/kg/day IM or IV once a day for 7 days
In children aged over 2 months	Ceftriaxone 100mg/kg/day once a day (maximum 2g) IM or IV for 5 days
In children aged >14 years and adults	Ceftriaxone 2g/day once a day IM or IV for 5 days
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 products

During a response to an outbreak of any disease transmitted through direct contact with infectious body fluids (blood, urine, stool, semen, and sputum for example), an inexpensive system can be set up using ordinary household bleach.

The following table describes how to make 1:10 and 1:100 chlorine solutions from household bleach and other chlorine products.

Use this chlorine product	To make a 1:10 solution for disinfecting:	To make a 1:100 solution for disinfecting:
	<ul style="list-style-type: none"> • Excreta • Cadavers • Spills of infectious body fluids 	<ul style="list-style-type: none"> • Gloved hands • Bare hands and skin • Floors • Clothing • Equipment • Bedding
Household bleach 5% active chlorine	1 litre bleach per 10 litres of water	100 ml per 10 litres of water, or 1 litre of 1:10 bleach solution per 9 litres of water
Calcium hypochlorite powder or granules 70% (HTH)	7 grams or $\frac{1}{2}$ tablespoon per 1 litre of water	7 grams or $\frac{1}{2}$ tablespoon per 10 litres of water
Household bleach 30% active chlorine	16 grams or 1 tablespoon per 1 litre of water	16 grams or 1 tablespoon per 10 litres of water

To disinfect clothing:

- Promptly and thoroughly disinfect patient's personal articles and immediate environment using one of the following disinfectants:
 - Chlorinated lime powder;
 - 1% chlorine solution;
 - 1% to 2% phenol solution.
- Promptly and thoroughly disinfect patient's clothing:
 - Wash clothes with soap and water;
 - Boil or soak in disinfectant solution;
 - Sun dry;
 - Wash utensils with boiling water or disinfectant solution;
 - Do not wash contaminated articles in rivers or ponds that might be sources of drinking water, or near wells.

Using Market/Shelf liquid bleach to prepare the desired % of chlorine

% Chlorine in bleach ((Market/Shelf) minus 1 = Parts of water for each part of bleach

% Chlorine desired

Example: To make a 2% chlorine solution from 5% bleach,

5 minus 1 = (2.5) minus 1 = 1.5 parts water for each part of bleach

2

Thus, to make 2% chlorine solution add 1 part bleach to 1.5 parts water

Annex 6C: Planning an emergency immunization activity

1. Review with health workers the need to plan vaccination campaigns and specify the target population for the immunization activity.
2. Estimate the necessary amounts of vaccine, diluent and immunization supplies such as sterile syringes and sterile needles, cold boxes, vaccine carriers and safety boxes.
 - (a) Coordinate with national Immunization and Disease Prevention Control (IVD) program, WHO country office and UNICEF offices to arrange for provision of necessary vaccines and supplies.
 - (b) A list of pre-qualified WHO vaccines is available at:
http://www.who.int/immunization_standards/vaccine_quality/PQ_vaccine_list_en/en/. If a country already has an ICC, ensure that there is discussion and agreement on the type of vaccine to be given, who to give and the methodology to be used.
 - (c) Contact the national level to request vaccines. If a national reserve stock is not available, the national IVD program manager will request an emergency supply from WHO.
3. Choose the immunization sites and inform the community.
 - (a) Coordinate with the EPI/IVD or disease control program in your district to identify sites for conducting the immunization activity.
 - (b) Identify the facilities that can participate in the activity.
 - (c) Identify a mobile immunization team, if needed.
 - (d) Determine if there are any hard-to-reach areas; e.g., a transient workers' camp. Identify a mobile immunization team to reach these areas.
 - (e) Contact the facilities and schedule the immunization sites.
 - (f) 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 microplan is the operational plan for a campaign at the county or lower level. Ensure the plan has at least the following:
 - (a) estimate of the number of vaccination teams required and their composition including roles and responsibilities of team members, as well as number of supervisors and monitors;
 - (b) list of supervisors and their contact numbers;
 - (c) travel plan for teams and supervisors including transportation requirements;
 - (d) mapping of the coordination with other partners and regions/districts local partners like NGOs, faith-based and civic organizations, etc.;
 - (e) maps of the targeted area;
 - (f) cold chain requirements and maintenance;
 - (g) plan for distribution of logistics;
 - (h) plans for disposal of waste from campaign;
 - (i) social mobilization plan with community leaders mapped and engaged;
 - (j) training schedule;
 - (k) budget 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:
 - (a) one to two vaccinators to give immunizations;
 - (b) one recorder to record on immunization cards;
 - (c) community health workers if already available 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 there is:
 - (a) a clear communication plan that includes easy-to-understand information on the need for the campaign;
 - (b) a clearly-defined target group for the campaign;
 - (c) a clear understanding of the dates of the campaign;
 - (d) a mechanism in the communication plan for rapidly identifying and addressing rumours that may arise during the campaign;
 - (e) a single point of contact that is well versed in risk communication and the local culture;
 - (f) 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 the necessary arrangements for lodging if the site is far 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 amount of remaining stocks and supplies necessary for the next day.
 - (c) Ensure that the estimated number of individuals vaccinated is monitored daily and tracked against target population.
 - (d) Follow-up visit plans should be made for missed individuals based on tally/summary sheet information.
 - (e) Document any missing houses/individuals who should be followed up on subsequent days.
 - (f) Review the team available on site and if necessary reallocate/deploy the teams to other sites based on the workload.
 - (g) Conduct brief feedback sessions at the end of each day with vaccination teams and make the necessary mid-course corrections.

NB: A rapid guide to common SIA problems and potential quick fixes is available at:

<http://www.polioeradication.org/Portals/0/Document/Resources/PolioEradicators/1c.QuickFixesforSIA20100914.pdf>

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 aged 0 to 5 years
_____ children aged 9 months up to 14 years; children and adults age 0 up to 30 years; women of childbearing age – 15 to 45 years; all adults and children in the general population

1. Calculate the size of the target population. If the activity only targets a proportion of the general population, estimate the size of the target population. Multiply the general population times the percentage of children or adults in the target population. If you do not know the exact age distribution rates in your area, use recommended estimates such as the following:
 - children aged 0 to 5 years 20%
 - children aged 9 months up to 14 years 45%
 - children and adults aged 1 to 30 years 70%
 - women of childbearing aged 15 to 45 years 20%
2. Find out how many doses each person should receive. Record the number below as “number of doses recommended.”
3. Allow for wastage. Use a wastage factor of 20%. Multiply the size of the target population (see step 1) times the number of doses times 1.20.

$$\begin{array}{ccc} \text{X} & & \times 1.20 = \\ \text{Size of target population} & \text{Number of recommended doses} & \text{wastage} \\ & & \\ & & \end{array} \qquad \qquad \qquad \begin{array}{c} \text{Number of doses to order} \\ \text{including wastage} \end{array}$$

NB: It is recommended that the wastage factor of 20% should be used only at the national level to estimate vaccine requirement during an outbreak. Use a wastage factor of 15% at the subnational and district levels and 10% at the health facility level.

4. Allow for a contingency stock. Use a reserve factor of 25%. Multiply the estimated number of doses including wastage times 1.25 to obtain the total estimated number of doses.

$$\begin{array}{ccc} \text{Number of doses} & \times & 1.25 \\ & & \\ & & \end{array} = \qquad \qquad \qquad \begin{array}{c} \text{Total number of estimated doses including wastage} \end{array}$$

NB: It is recommended that the contingency stock be kept only at the national level. However, if a subnational level has adequate capacity for vaccine storage then it can also keep a contingency stock.

5. To obtain the total number of vials of vaccine to order, divide the total number of estimated doses by the number of doses contained in the vial. (This is usually printed on the label and may be one, two, five, ten or twenty doses).

$$\begin{array}{ccc} \text{Total number of estimated doses} & \div & \text{Doses per vial} \\ & & \\ & & \end{array} = \qquad \qquad \qquad \begin{array}{c} \text{Total number of vials required} \end{array}$$

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

$$\underline{\hspace{2cm}} \quad \times \quad \underline{\hspace{2cm}} \quad = \quad \underline{\hspace{2cm}}$$

Diluent required *Total number of vial* *Total diluent to order per vial*

7. Estimate the number of sterile needles and syringes that will be needed to carry out the activity. If single-use needle and syringes are used, order the same amount as for the estimated number of doses in Step 4.
8. In addition, estimate the number of dilution syringes necessary for preparing the vaccine. Source: Field Guide for Supplementary Activities Aimed at Achieving Polio Eradication, World Health Organization, Geneva 1997. District guidelines for yellow fever surveillance, Division of Emerging and other communicable disease surveillance and control, World Health Organization, Geneva 1998.
9. Estimate the number of safety boxes required

Annex 6E: Recommended immunization practices

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

1. Reconstitute the vaccine correctly:
 - (a) Determine the appropriate quantity of diluent to reconstitute the freeze-dried vaccine.
 - (b) Use a sterile syringe and sterile needle for each dose.
 - (c) Using the dilution syringe, draw up and expel the diluent several times in the vial that contains the vaccine so as to mix the reconstituted vaccine well.
2. Wrap the vial in silver foil or cover it with a dark cloth. This will protect the vial from sunlight.
3. In a field situation, protect the vaccine and diluent from contamination. Cover the open top of the vial with foil to keep out dirt and flies.
4. Store reconstituted vaccine vials and opened liquid vaccine vials immediately, standing them on chilled ice or on an ice pack. Keep the ice and vaccines in the shade.
5. Follow multidose vial policy as applicable; e.g., for measles and polio.
6. Record the dose on an immunization card for each person immunized, if it is national policy to require immunized persons to have a card.
7. Collect data for monitoring the activity. For example, record the number of doses given on a tally sheet so that coverage from the campaign can be calculated.
8. Remind health workers about the risk of getting blood-borne diseases from an accidental needle stick. Review safe practices for handling and disposing of sharp instruments and needles using a sharps box.
9. Arrange for safe disposal of used injection materials at the end of the activity. They can be 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:

ARE YOU PROTECTED FROM DYSENTERY (bloody diarrhoea)?

Washing your hands protects you and others from disease.

Always wash your hands:

- after defecation
- after cleaning a child who has defecated
- after disposing of a child's stool
- before and after eating
- before preparing or handling food.

Message:

ARE YOU READY FOR HAND-WASHING? Do you have

- Clean water and soap (or if you do not have soap, use ash or earth to scrub your hands)
- Clean cloth for drying.

Safe Handling of food

Encourage the following food safety practices:

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

Message:

DO YOU PREPARE FOOD SAFELY? Cooking kills germs

- Thoroughly cook all meats, fish and vegetables.
- Eat cooked meats, fish and vegetables while they are hot.

Washing protects from disease

- Wash your hands before preparing or serving food.
- Wash your dishes and utensils with soap and water.
- Wash your *chopping board* especially well with soap.

Peeling protects from disease

- Only eat fruits that have been freshly peeled (such as bananas and oranges).

KEEP IT CLEAN: COOK IT, PEEL IT, OR LEAVE IT.

Five Keys to Safer Food

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

Five keys to safer food



Keep clean

- ✓ Wash your hands before handling food and often during food preparation
- ✓ Wash your hands after going to the toilet
- ✓ Wash and sanitize all surfaces and equipment used for food preparation
- ✓ Protect kitchen areas and food from insects, pests and other animals

Why?

While most microorganisms do not cause disease, dangerous microorganisms are widely found in soil, water, animals and people. These microorganisms are carried on hands, wiping cloths and utensils, especially cutting boards and the slightest contact can transfer them to food and cause foodborne diseases.



Separate raw and cooked

- ✓ Separate raw meat, poultry and seafood from other foods
- ✓ Use separate equipment and utensils such as knives and cutting boards for handling raw foods
- ✓ Store food in containers to avoid contact between raw and prepared foods

Why?

Raw food, especially meat, poultry and seafood, and their juices, can contain dangerous microorganisms which may be transferred onto other foods during food preparation and storage.

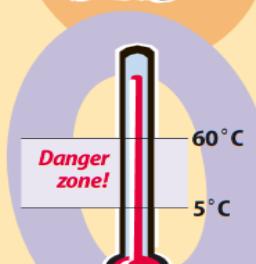


Cook thoroughly

- ✓ Cook food thoroughly, especially meat, poultry, eggs and seafood
- ✓ Bring foods like soups and stews to boiling to make sure that they have reached 70°C. For meat and poultry, make sure that juices are clear, not pink. Ideally, use a thermometer
- ✓ Reheat cooked food thoroughly

Why?

Proper cooking kills almost all dangerous microorganisms. Studies have shown that cooking food to a temperature of 70°C can help ensure it is safe for consumption. Foods that require special attention include minced meats, rolled roasts, large joints of meat and whole poultry.



Keep food at safe temperatures

- ✓ Do not leave cooked food at room temperature for more than 2 hours
- ✓ Refrigerate promptly all cooked and perishable food (preferably below 5°C)
- ✓ Keep cooked food piping hot (more than 60°C) prior to serving
- ✓ Do not store food too long even in the refrigerator
- ✓ Do not thaw frozen food at room temperature

Why?

Microorganisms can multiply very quickly if food is stored at room temperature. By holding at temperatures below 5°C or above 60°C, the growth of microorganisms is slowed down or stopped. Some dangerous microorganisms still grow below 5°C.



Use safe water and raw materials

- ✓ Use safe water or treat it to make it safe
- ✓ Select fresh and wholesome foods
- ✓ Choose foods processed for safety, such as pasteurized milk
- ✓ Wash fruits and vegetables, especially if eaten raw
- ✓ Do not use food beyond its expiry date

Why?

Raw materials, including water and ice, may be contaminated with dangerous microorganisms and chemicals. Toxic chemicals may be formed in damaged and mouldy foods. Care in selection of raw materials and simple measures such as washing and peeling may reduce the risk.

Safe disposal of human waste

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

Community messages should emphasize the following:

- Everyone, including children, should use latrines properly.
- Transfer children's excreta with a scoop or shovel to the latrine or bury in a hole.
- Avoid defecating on the ground, or in or near the water supply.

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

Message:

ARE YOU PROTECTED FROM DYSENTERY (bloody diarrhoea)? DO YOU USE A TOILET OR LATRINE?

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

- *Always use* a toilet or latrine. If you don't have one – build one!
- Keep the toilet or latrine *clean*.
- *Wash your hands* with soap (or ash) and clean water after using the toilet or latrine.

KEEP IT CLEAN: USE A TOILET OR LATRINE

Clean drinking water and storage

Community drinking water supply and storage

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

Home drinking water storage and treatment

When the safety of the drinking water is uncertain, it should be chlorinated in the home or boiled.

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

1. *Covered containers* that are cleaned daily and kept away from children and animals. Water should be removed from the containers using a long-handled dipper, kept especially for this purpose.
2. *Narrow-mouthed containers* with an opening too small to allow the insertion of a hand. Water should be removed by pouring from the opening or 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 from diarrhoea or a viral haemorrhagic fever are still infectious. Use extreme caution when preparing the bodies of suspected cholera or viral haemorrhagic fever patients. Encourage safe funeral and burial practices

Reducing Exposure to mosquitoes

Mosquito control is the main intervention for reducing malaria transmission. It can reduce malaria transmission from very high levels to close to zero. In high transmission areas, mosquito control can significantly reduce child and maternal deaths. Personal protection against mosquito bites is the first line of defence for malaria prevention.

Message:

ARE YOU PROTECTED FROM MOSQUITOES BITES? Whenever possible:

- Avoid going out between dusk and dawn when mosquitoes commonly bite.
- Wear long-sleeved clothing and long trousers when going out at night, and avoid dark. Colours, which attract mosquitoes.
- Apply insect repellent to exposed skin (if the repellent is available).
- Use screens over doors and windows.
- Use an insecticide-treated mosquito net over the bed.
- Use anti-mosquito sprays or insecticide dispenser (if available).

Malaria transmission can rapidly be reduced through indoor residual spraying (IRS) with insecticides. IRS works for 3 to 12 months, depending on the insecticide used and the type of surface on which it is sprayed.

Annex 6G: Outbreak communication

Introduction

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

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

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

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

Actions at the district level

- Identify spokesperson(s) at district level (political and technical).
- Liaise regularly with national authorities to provide them with first-hand information (received at the community local level, the media, local stakeholders).
- Be in contact regularly with national authorities to receive common messages including guidelines and answers for frequently asked questions to feed the local media.
- Be available for interviews by local media upon request to provide accurate, transparent and updated information following directions from the national level, using simple clear key messages.
- Organize press briefings to provide regular information to local media, following directions from the national level.
- Develop good relationships with local media to partnership for delivery of accurate, transparent, timely messages to the population.
- Use information materials developed at the national level with clear consistent messages to provide guidance to the population.
- Identify local powerful channels for the delivery of information to the population.
- Meet regularly with local stakeholders to disseminate a correct message of prevention and surveillance to the population.
- Organize preventive door-to-door campaigns to reach 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, caregiver

Steps in hand-washing

- 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).
- Remove jewellerys (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.
- Wet the hands and wrists, keeping hands and wrists lower than the elbows (to ensure that the water flows to the fingertips, avoiding arm contamination).
- Apply soap (plain or antimicrobial or ash) and lather thoroughly.
- Use firm, circular motions to wash the hands and arms up to the wrists, covering all areas including palms, back of the hands, fingers, between fingers and lateral side of the fifth finger, knuckles and wrists.
- Rub for a minimum of 10-15 seconds.
- Repeat the process if the hands are very soiled. Clean under the fingernails.
- Rinse hands thoroughly, keeping the hands lower than the forearms. If running water is not available, use a bucket and pitcher.
- Do not dip your hands into a bowl to rinse, as this re-contaminates them. Collect used water in a basin and discard in a sink, drain or toilet.
- Dry hands thoroughly with disposable paper towel or napkins, a clean dry towel or air-dry them. Discard the used towel in an appropriate container without touching the lid. Use a paper towel, clean towel or your elbow/foot to turn off the faucet to prevent re-contamination.

Different types of antiseptic disinfection:

Using antiseptics, hand rubs gels or alcohol swabs for hand antisepsis:

- Apply the product to the palm of one hand. The volume needed for one application varies per product.
- Rub hands together, covering all surfaces of hands and fingers, until hands are dry.
- 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:

- Thoroughly wet hands.
- Apply a hand-washing agent (liquid soap); an antiseptic agent is not necessary.
- Vigorously rub all areas of hands and fingers for 10–15 seconds (tip: 10 average breaths), paying close attention to fingernails and between fingers.
- Rinse hands thoroughly with clean running water from a tap or bucket.
- Dry hands with paper towel or a clean, dry towel or air-dry them.
- Use a paper towel or clean, dry towel when turning off water if there is no foot control or automatic shut off.



Source: World Health Organization (WHO) 2005.

NB:

- If bar soap is used, provide small bars and soap racks that drain.
- Use running water and avoid dipping hands into a basin containing standing water; even with the addition of an antiseptic agent, microorganisms can survive and multiply in these solutions.
- Do not add soap to a partially empty liquid soap dispenser. This practice of “topping off” dispensers may lead to bacterial contamination of the soap.
- When soap dispensers are reused, they should be thoroughly cleaned before filling.
- When no running water is available, use a bucket with a tap that can be turned off to lather hands and turned on again for rinsing, or use a bucket and pitcher.
- Used water should be collected in a basin and discarded in a latrine if a drain is not available.

Guidance to donning and doffing of PPE

Steps to put on WHO PPE using coverall

1. Remove all personal items (jewellery, watches, cell phones, pens, etc.).
2. Put on the scrub suit and rubber boots* in the changing room.
3. Move to the clean area at the entrance of the isolation unit.
4. Gather PPE beforehand. Select the right size coverall.
5. Put on PPE under the guidance and supervision of a buddy.
6. Perform hand hygiene.
7. Put on inner gloves (examination, nitrile).
8. Put on coverall.
9. Thumb (or middle finger) hole in the coverall sleeve or thumb loop.
10. Put on face mask.
11. Put on face protection (either face shield or goggles).
12. Put on head covering: Surgical bonnet or hood.
13. Put on disposable waterproof apron (if not available, use heavy duty, reusable waterproof apron).
14. Put on outer gloves (examination, nitrile) over cuff.
15. Self-check in mirror.
16. Check buddy and write name/occupation/ time of entry.

Steps to put on personal protective equipment (PPE) including coverall			
1 Remove all personal items (jewelry, watches, cell phones, pens, etc.)	2 Put on scrub suit and rubber boots ¹ in the changing room.	3 Move to the clean area at the entrance of the isolation unit.	6 Perform hand hygiene.
7 Put on gloves (examination, nitrile gloves).	8 Put on coverall. ²	9 Put on face mask.	10 Put on face shield OR goggles.
11 Put on head and neck covering (surgical bonnet covering neck and sides of the head (preferable with face shield) OR hood).	12 Put on disposable waterproof apron (if not available, use heavy duty, reusable waterproof apron).	13 Put on second pair of (preferably long cuff) ² gloves over the cuff.	
			<p>¹ If boots are not available, use closed shoes (slip-ons without shoelaces and fully covering the dorsum of the foot and ankles) and shoe covers (nonslip and preferably impermeable)</p> <p>² Do not use adhesive tape to attach the gloves. If the gloves or the coverall sleeves are not long enough, make a thumb (or middle finger) hole in the coverall sleeve to ensure that your forearm is not exposed when making wide movements. Some coverall models have finger loops attached to sleeves.</p>

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Steps to take off WHO PPE using coverall

1. Always remove PPE under the guidance and supervision of a trained observer (colleague).
2. Enter decontamination area by walking through chlorine tray.
3. Perform hand hygiene on gloved hands (0.5% chlorine).
4. Remove apron taking care to avoid contaminating your hands by peeling it off.
5. Perform hand hygiene on gloved hands (0.5% chlorine).
6. Remove hood or bonnet taking care to avoid contaminating your face.
7. Perform hand hygiene on gloved hands (0.5% chlorine).
8. Remove coverall and outer pair of gloves.
9. Tilt head back to reach zipper, unzip completely without touching any skin or scrubs, remove coverall from top to bottom.
10. After freeing shoulders, remove the outer gloves while pulling the arms out of the sleeves.
11. With inner gloves roll the coverall, from the waist down and from the inside of the coverall, down to the top of the boots.
12. Use one boot to pull off coverall from other boot and vice versa, and then step away from the coverall and dispose of it safely.
13. Perform hand hygiene on gloved hands (0.5% chlorine)
14. Remove the goggles or face shield from behind the head (keep eyes closed).
15. Perform hand hygiene on gloved hands (0.5% chlorine).
16. Remove mask from behind the head (keep eyes closed).
17. Perform hand hygiene on gloved hands (0.5% chlorine).
18. Remove inner gloves with appropriate technique and dispose of safely.
19. Decontaminate boots appropriately and move to lower risk area one foot at a time and Perform hand hygiene (0.05% chlorine).

Steps to take off personal protective equipment (PPE) including gown

1 Always remove PPE under the guidance and supervision of a trained observer
 (colleague). Ensure that infectious waste containers are available in the doffing area for safe disposal of PPE. Separate containers should be available for reusable items.

2 Perform hand hygiene on gloved hands.¹

7 Remove head and neck covering taking care to avoid contaminating your face by starting from the bottom of the hood in the back and rolling from back to front and from inside to outside, and dispose of it safely.



8 Perform hand hygiene on gloved hands.

11 Remove eye protection by pulling the string from behind the head and dispose of it safely.



12 Perform hand hygiene on gloved hands.

15 Remove rubber boots without touching them (or overshoes if wearing shoes). If the same boots are to be used outside of the high-risk zone, keep them on but clean and decontaminate appropriately before leaving the doffing area.²

16 Perform hand hygiene on gloved hands.

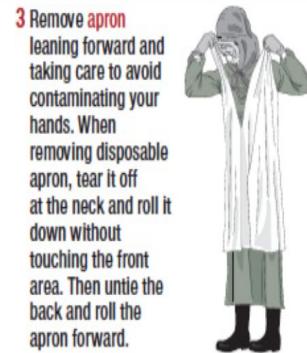
¹ While working in the patient care area, outer gloves should be changed between patients and prior to exiting (change after seeing the last patient)

² Appropriate decontamination of boots includes stepping into a footbath with 0.5% chlorine solution (and removing dirt with toilet brush if heavily soiled with mud and/or organic materials) and then wiping all sites with 0.5% chlorine solution. At least once a day boots should be disinfected by soaking in a 0.5% chlorine solution for 30 min, then rinsed and dried.

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3 Remove apron leaning forward and taking care to avoid contaminating your hands. When removing disposable apron, tear it off at the neck and roll it down without touching the front area. Then untie the back and roll the apron forward.

4 Perform hand hygiene on gloved hands.

5 Remove outer pair of gloves and dispose of them safely.

Use the technique shown in Step 17

6 Perform hand hygiene on gloved hands.



9 Remove the gown by untying the knot first, then pulling from back to front rolling it from inside to outside and dispose of it safely.

10 Perform hand hygiene on gloved hands.



13 Remove the mask from behind the head by first untying the bottom string above the head and leaving it hanging in front; and then the top string next from behind head and dispose of it safely.

14 Perform hand hygiene on gloved hands.

17 Remove gloves carefully with appropriate technique and dispose of them safely.



18 Perform hand hygiene.

Setting up a cholera isolation campy/unit/cholera treatment centre (CTC)

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 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 labour-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)

ORPs 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 centre, the following should be considered during site selection:

- proximity to the affected area;
- easy access for patients and supplies;
- protection against winds (there should be wind breaks);
- adequate space;
- compatibility with adjacent existing structures and activities;

- availability of adequate potable/safe water supply within a minimum distance to avoid contamination;
- good drainage from the site;
- provision of waste management facilities (clinical and general waste);
- availability of sanitary facilities (temporary);
- provision for extension of CTC (based on estimates from epidemiologist)

Setting up a temporary cholera treatment camp

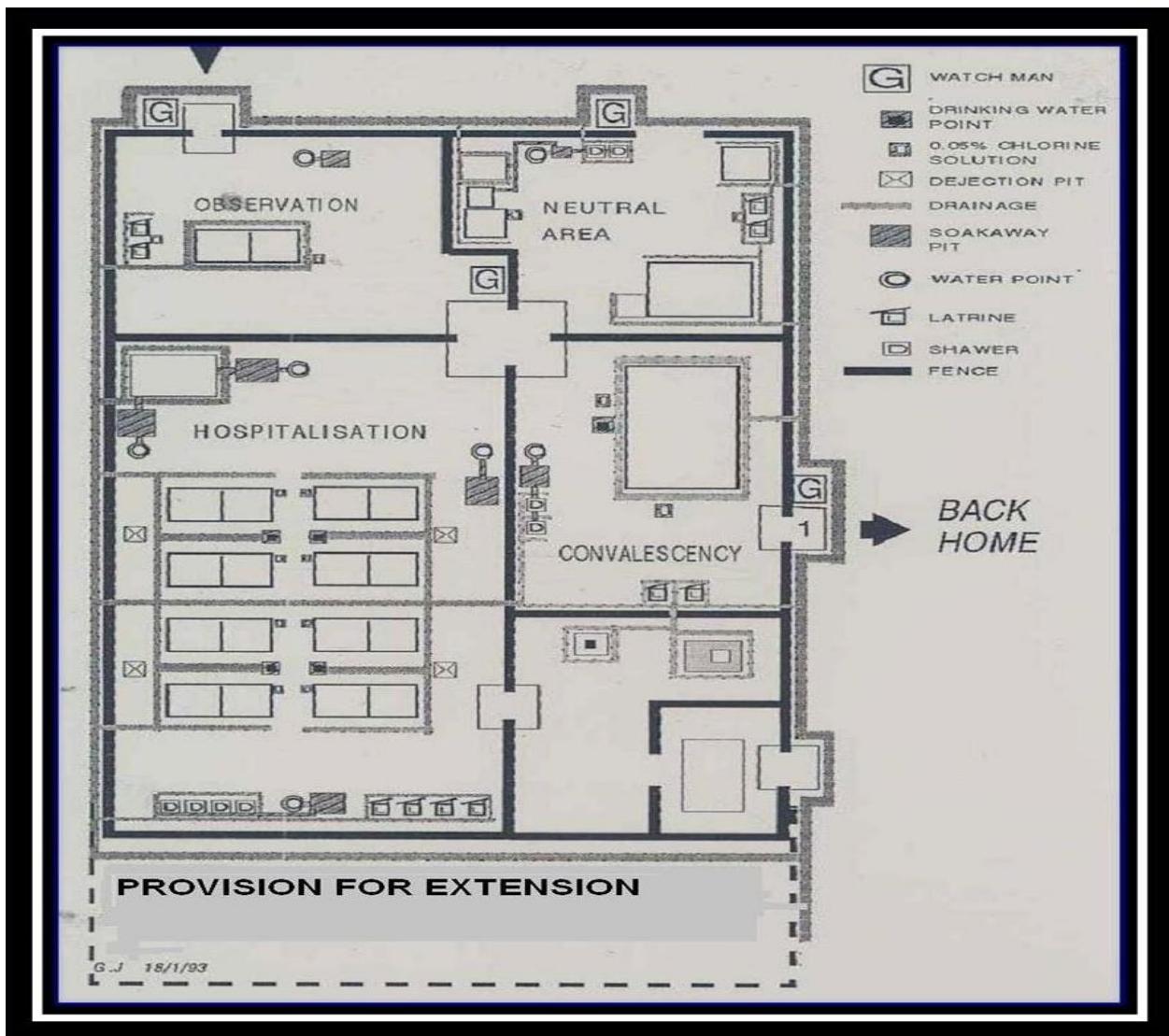
- In setting up a cholera camp, you can use an existing building or set up tents.
- It is important to consider the safety of patients and ventilation as high temperatures contributes to dehydration of the patients.
- The cholera camp should operate 24 hours a day independently of the other health facilities and therefore the necessary staff has to be recruited.
- It should be supplied with the necessary medical material specifically for the centre.
- An enclosure or other form of acceptable screen should be provided around the cholera camp.
- The various workstations should be clearly labelled and directions provided.
- The CTC must be a “closed system” where contamination is introduced through patients, and must be destroyed inside the structure. Under no circumstances should any contamination come out (through patients, water, material, solid and liquid waste etc.).

General rules for a good design:

- Strict necessary movement for staff and patient
- Each zone is a “closed box”
- Systematic disinfection between zones
- Discipline and mutual control for the patient, attendant and staff on hygiene

Good infection control means anything coming out is free of contamination

The diagram below is shows the layout of cholera treatment centre.



1. Triage and observation

- Patients are examined by a medical person for screening. If cholera, admit; otherwise send to normal dispensary.
- Patients are admitted with 1 attendant (caregiver) if necessary.
- Patients who are admitted are registered in the cholera line list.
- A foot bath should be provided at the entrance.
- Toilets and water should be easily accessible for patients.
- Shower facilities should be provided for the patients.
- A disinfection area should be provided for the transporting vehicles and contaminated articles used on the patients.

- (h) Tables, chairs, water containers fitted with taps, refuse receptacles should be provided in these areas.
- (i) Provide safe water.
- (j) Establish an ORP corner.

2. Admissions area

- (a) Patients with severe dehydration and/or uncontrollable vomiting must be hospitalized for immediate rehydration.
- (b) 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;
 - access to toilets and washing facilities (with disinfectant) or showers where possible) for the patients;
 - cholera beds with receiving buckets, buckets for those who vomit and water containers for patients;
 - tables and chairs for staff;
 - refuse receptacles
- (c) Patients should be screened by medical staff and categorized according to their status.

3. Convalescence/recovery area

- (a) The convalescence or recovery area is meant for oral rehydration after hospitalization when less surveillance is required. Patients can lie on mats or sit on benches, as in the observation area.
- (b) Patients who are no longer vomiting or having diarrhoea and who therefore require less medical attention can be put in this ward.
- (c) Separate rooms/tents should be provided for males and females.

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 and 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, including medical symptoms and description of events;
- report to the competent officials and obtain instructions. In case of less serious injury, remain in the area until monitored.

Respond to action threshold

If an accident is confirmed:

- reassess and review medium to long-term protective actions such as food-chain restrictions with relevant departments and agencies;
- 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 programme;
- 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 affected population.

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, thyroid counting. Radionuclides may be in the blood or excreted in the faeces or urine. Excreta should be placed in appropriate containers and blood samples in test tubes for counting.

Decontamination procedures

- Materials: Lukewarm water, soap or ordinary detergent, soft brush, sponges, plastic sheets, tape, towels, sheets, iodine tablets or solution.
- Procedural priority: Remove all clothing and place in plastic bags. Carry out life saving measures first. Identify contaminated areas, mark clearly and cover until decontamination takes place. 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:
 - 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: establish field medical post/s;
- field medical teams perform primary/secondary medical assessment;
- assign triage category to casualties based on the medical assessment;
- initiate appropriate treatment;
- prepare casualties for evacuation to hospital according to triage category;
- continue documentation of casualties;
- provide surveillance of casualties awaiting evacuation;
- liaise with casualty transport service;
- evacuate casualties to appropriate medical facilities according to priorities;
- ensure continuity of medical care for casualties along the whole length of the chain from the emergency site to the hospital;
- provide information to receiving medical facilities as necessary;
- treat minor injuries not requiring hospitalization.

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 postoperative 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
Asphyxiant/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 with pungent odor Phosgene gas smells like very newly mown hay or grass Possible frostbite	Eye and skin irritation Airway irritation Dyspnoea, cough Sore throat Chest tightness
Blistering/Vesicant	Mustard/Sulfur Mustard (HD, H) Mustard (gas) Nitrogen mustard Lewisite (L)	Immediately decontaminate skin; flush eyes with water or normal saline for 10-15 minutes; if breathing difficulty, give oxygen and any supportive care	Possible pulmonary oedema Mustard has an asymptomatic latent period There is no antidote or treatment for mustard Lewisite has immediate burning pain, blisters later Specific antidote British Anti Lewisite (BAL) may decrease systemic effects of Lewisite
Incapaciting/behavior-altering	Agent 15/BZ	May appear as mass drug intoxication with ecstatic behavior, distinct hallucinations and confusion Hyperthermia Mydriasis (dilated pupils)	May cause death Dry mouth and skin Initial tachycardia Altered consciousness, delusions, denial of illness, belligerence Hyperthermia Ataxia (lack of coordination) Hallucinations Mydriasis (dilated pupils)

Decontamination and treatment

Agent Type	Decontamination	First Aid Access ABCs	Other patient consideration
Nerve	Remove clothing immediately. Gently wash skin with soap and water Do not abrade skin For eyes, flush with plenty of water or normal saline	Atropine before other measures Pralidoxime (2PAM) chloride	Onset of symptoms from dermal contact with liquid forms may be delayed Repeated antidote administration may be necessary
Asphyxiant/Blood Arsine	Remove clothing immediately – if no frostbite Gentle wash skin with soap and water	Rapid treatment with oxygen For cyanide, use antidotes (sodium nitrite and then sodium thiosulfate)	Arsine and cyanogen chloride may cause delayed pulmonary oedema
Choking/Pulmonary damaging	Remove clothing immediately if no frostbite Gently wash skin with soap and water Do not abrade the skin For eyes, flush with plenty of water or normal saline	Fresh air Forced rest Semi upright If signs of respiratory distress are present, oxygen with or without positive airway pressure may be needed Other supportive therapy as needed	May cause delayed pulmonary oedema, even following a symptom free period that varies in duration with the amount
Blistering/Vesicant	Immediate decontaminate is essential to minimize damage Remove clothing immediately Gently wash skin with soap and water Do not abrade skin For eyes, flush with plenty of water or normal saline	Immediate decontaminate skin, flush eyes with water or normal saline for 10–15 minutes	Possible pulmonary oedema Mustard has an asymptomatic latent period, there is no antidote for mustard Lewisite has immediate burning pain, blisters later Specific antidote British Anti Lewisite (BAL) may decrease systemic effects of Lewisite Phosgene oxime causes immediate pain
Incapaciting/behavior-altering	Remove clothing immediately Gentle wash skin with water or soap and water Do not abrade skin	Remove heavy clothing Evaluate mental status Use restraints as needed Monitor core temperature carefully Supportive care	Hyperthermia and self-injury are targets risks Hard to detect because it is an odorless and non-irritating substance Possible serious arrhythmias Specific antidote (physostigmine) may be available

Antidote recommendations following exposure to cyanide

Patient	Mild (Conscious)	Severe (unconscious)	Other treatment
Child	Anti dotes may not be necessary	Sodium nitrite: 0.12-0.33ml/kg, not to exceed 10ml of 3% solution. Slow IV no less than 5 minutes, or slower if 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 apnoeic after antidote administration, consider sodium bicarbonate for severe acidosis
Adult	Antidote may not be necessary	Sodium nitrite: 10-20ml of 3% solution slow IV over no less than 5 minutes, or slower if hypotension develops and Sodium thiosulfate: 50ml of 25% solution IV over 10-20 minutes	

Note:

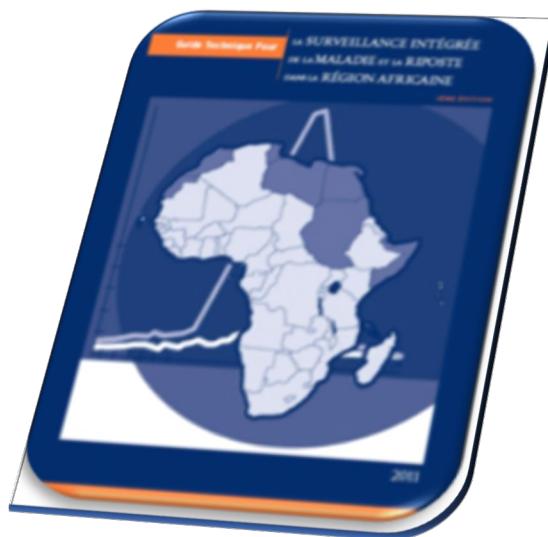
1. Victims whose clothing or skin is contaminated with hydrogen cyanide liquid or solution can secondarily contaminate response personnel by direct contact or through off-gassing vapours.
2. Avoid dermal contact with cyanide contaminated victims or with gastric contents of victims who may have ingested cyanide-containing materials.
3. Victims exposed only to hydrogen cyanide gas do not pose contamination risks to rescuers. If the patient is a victim of recent smoke inhalation (may have high carboxyhemoglobin levels), administer only sodium thiosulfate.
4. If sodium nitrite is unavailable, administer amyl nitrite by inhalation from crushable ampoules.
5. Available in Pasadena Cyanide Antidote Kit, formerly Lilly Cyanide Kit.

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INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES

THIRD EDITION



SECTION 7: RISK COMMUNICATION

MARCH 2019

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7. 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 a two-way exchange of information, perceptions and advice among risk assessors, risk managers, and various groups of people in the society about the likelihood and consequences of harm from the event (WHO, 2005). Its ultimate purpose is to ensure that everyone at risk is able to take informed decisions to mitigate the effects of the threat (hazard) such as a disease outbreak and take protective and preventive action. Risk communication uses a mix of communication and engagement strategies and tactics, including but not limited to, media communication, social media, mass awareness campaigns, health promotion, stakeholder engagement, social mobilization and community engagement.

The current 21st century has been marked by an exponential growth in travel, trade, migration, as well as a communication technology revolution that has widened access to a variety of means of communication and information. The public and communities have been exposed to a variety of dynamic, fast-changing, formal and informal media, social media and complex social networks that influence how risk is communicated, perceived and acted on. The latest evidence shows that the practice of risk communication 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 and prevention of avoidable death and disease with the least possible disruption to economies and society. During epidemics and pandemics as well as humanitarian crises and natural disasters, effective risk communication enables people who are most at-risk to understand and adopt protective behaviours. It enables the authorities and experts to heed and address people's concerns and needs, and to offer advice that is relevant, trusted and acceptable.

This section describes how to conduct risk communication before, during and after an outbreak. Effective communication equips those at risk with the knowledge they need to make informed decisions for protective action. It also provides decision-makers with summary information especially regarding outbreak response, so that they review how resources were applied to contain the event.

7.1 Risk communication in the context of IDSR

The Integrated Disease Surveillance and Response (IDSR) strategy is an approach for improving public health surveillance and response for priority diseases, conditions and events at the community, health facility, district and national levels. Since IDSR has the potential to ensure the reliable supply of information at the national level with a view to fulfilling IHR requirements, risk communication should be included in all IDSR core functions and activities, particularly detection, sample collection, reporting, analysis and interpretation, feedback, response and preparedness. 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 IDSR objectives.

If risk communication is well planned and integrated into IDSR, it can improve decision-making and the adoption of recommended behaviours by communities and also contribute to the prevention, control and response to priority diseases and other public health events. Such communication needs to be carefully planned, implemented and properly integrated with emergency management activities and operations at the community, district, region or province/county and national levels to support all relevant core IDSR functions and related activities.

7.1.1 Benefits of risk communication

Risk communication improves decision-making, compliance with treatment and the required behaviours for preventive actions. It also promotes transparency and accountability and builds trust with individuals, community leaders, health workers and policymakers. When risk communication is properly conducted, it promotes the primary public health goal of rapid outbreak containment, thereby preventing avoidable death and disease with the least possible disruption to economies and society. During epidemics, pandemics, humanitarian crises and natural disasters, effective risk communication enables people who are most at-risk to understand and adopt protective behaviours. It enables the authorities and experts to heed and address people's concerns and needs, and to offer advice that is relevant, trusted and acceptable. It is critical that risk communication is not only targeted at outbreak response; risk communication plans should include activities conducted before, during 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 limited. Hence, communicating advice and guidance is often the first and most important public health tool in managing a risk. Proactive risk communication encourages the public and service providers to adopt protective behaviours when they are linked to functioning systems and services. It facilitates heightened disease surveillance, reduces

confusion, and minimizes miscommunication and falsehoods (rumours) related to the cause and transmission of a disease as well as proven effective protective actions. It allows for better use of resources, which is crucial to effective response (WHO, 2008).

7.1.2 Target audiences for risk communication

- Community: All people at risk of acquiring a 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
- Points of entry and exit
- Airlines staff
- Immigration officers
- Travellers
- Stakeholders (policymakers, 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

7.1.3 Community engagement and its relevance to public health emergency preparedness and response

Community engagement is crucial to risk communication. Community engagement is the process of working collaboratively with and through people affiliated by geographical proximity, special interest, or similar situations to address issues affecting their well-being and is often used as an active method of implementing change. During risk communication, the emphasis is on building relationships and trust. The steps for community engagement involve:

- (a) setting the goals of the plan;
- (b) determining who to engage;
- (c) developing engagement strategies;
- (d) prioritizing these activities;
- (e) designing an implementation plan; and
- (f) monitoring your progress.

Effective community engagement helps you to:

- (a) know the community (problems and needs);
- (b) understand existing health beliefs, attitudes and practices;
- (c) listen to the community carefully;
- (d) analyse community dynamics; and
- (e) involve the community in all aspects of the response beginning from planning stages.

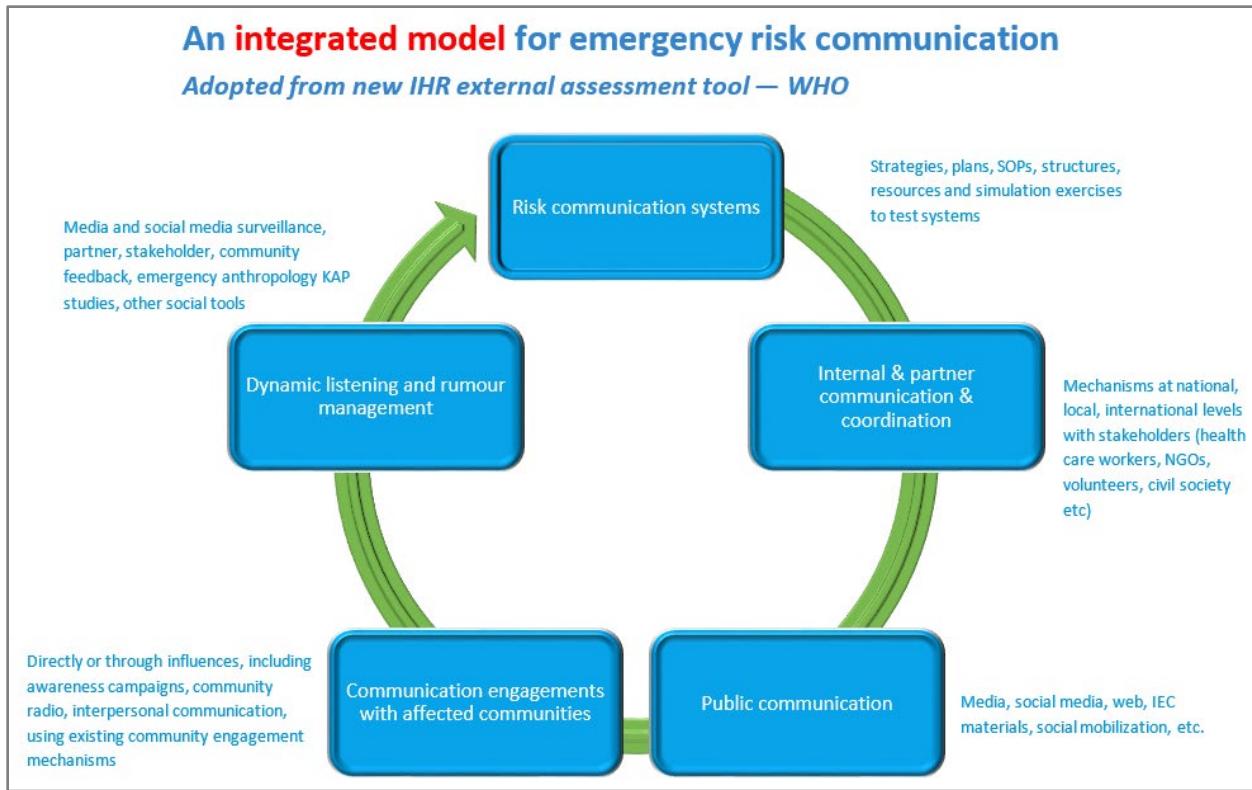
7.1.4 Risk communication approaches

The components needed for effective emergency risk communication include:

- (a) health education;
- (b) social mobilization;
- (c) community engagement;
- (d) media and social media;
- (e) outbreak communication;
- (f) crisis communication;
- (g) messaging (information, education and communication (IEC) and behaviour change communication (BCC));
- (h) Rumour monitoring and management; and
- (i) advocacy.

7.1.5 Integrated risk communication model

Since risk communication is a complex activity involving different audiences, it is crucial to adopt an integrated approach. The key components for integrated emergency risk communication are presented in Figure 1. This model allows for the successful design and implementation of an effective communication strategy. It highlights the need for a collaborative approach between different target audiences across the board.



7.2 Key inter-linked principles for effective communication

There are five key principles for effective communication as outlined below:

I. Creating and maintaining trust

Building and maintaining trust is, arguably, the most important function in effective communication during an outbreak or a public health event and should include:

- timely, transparent information regarding the nature of the threat;
- the response to the event; and
- actionable advice on protective actions people can take that, together with functioning services, increase self-efficacy.

This creates trust in the response and the response teams and increases the likelihood that they will follow the advice given. Trust is now considered the most important requirement for effective risk communication.

According to the latest evidence, risk communication in health emergencies should include ensuring genuine participation of the population, taking into account three key elements, namely:

- (a) understanding of the specific context, concerns, beliefs, practices and traditions of the population concerned in order to develop scientific and logistical information and explanations that address community concerns (social science intelligence);
- (b) provision of understandable and trusted advice that they are likely to follow to save lives and curb the outbreak within the shortest possible time; such advice is provided in their own languages, adapted to their educational levels and preferences (i.e. oral or visual) and disseminated through their preferred channels and interlocutors (translational communication); and
- (c) meaningful community engagement and the participation of (their) trusted interlocutors/messengers (means of dissemination).

Risk communication should include timely, transparent, understandable information relayed to the affected and at-risk population on:

1. the nature of health risk they face;
2. the response that is being organized; and
3. what they can do to protect themselves and their loved ones.

Trust is therefore the currency for all public health interventions, and has, in the current era of information overload, emerged as the critical element for effective risk communication (i.e., ensuring that expert advice is acted on by key stakeholders and affected and at-risk populations). Risk communication should therefore be aimed at building, maintaining or restoring public trust in those tasked with risk management. The latest evidence from 21st century epidemics reveals that, in order to build trust, risk communication activities should:

- (a) be linked to functioning and accessible services;
- (b) be transparent and timely;
- (c) be easy to understand for target populations (i.e., in their preferred oral or visual formats; in their own languages or dialects; and tailored to their educational levels and cultural references);
- (d) acknowledge and communicate uncertainty (neither over-reassure nor speculate; rather, communicate frequently so that the evolution of the event and public understanding are transparent and not destroy trust);

- (e) link to self-efficacy (Can people really do what you ask them? Do they have the ability, equipment, services, education they need to adopt our advice?);
- (f) be disseminated using multiple platforms, methods and channels;
- (g) identify, involve and collaborate with people that the community trusts when making decisions and not just in information dissemination. This ensures that interventions and any communication on them are contextually appropriate and community-owned.

II. Timely announcements and transparency:

In most cases, public response to a health threat depends on the way the first and subsequent announcements are made. This means that an event or threat should be announced as and when it emerges, even when the information is incomplete or changing fast. This in turn implies that communicating uncertainty is a cornerstone of risk communication. Communication by authorities, response managers or front-line personnel must include:

- (a) information about the uncertainties associated with the risk, event and interventions;
- (b) information indicating what is known and unknown at each given moment in time;
- (c) a commitment and follow-up to keep people frequently informed and updated on the changing, uncertain situation;
- (d) multiple platforms, mechanisms and trusted interlocutors to ensure that consistent and coordinated information reaches stakeholders and the population.

III. Listening to, understanding and respecting public concerns

Understanding public perceptions, concerns, fears and expectations is as critical to risk communication as understanding the risky practices and behaviours that affect risk. The understanding of communities must start before and during an emergency. There are many ways to improve awareness of community concerns and understand the contexts that determine whether the advice given to them on corrective or preventive practices will actually be accepted and acted upon. These include knowledge, attitude and practice (KAP) surveys or mini-surveys, community walk-throughs, focus group discussions, key informant interviews, getting feedback from stakeholders, social media and media monitoring, etc. A serious attempt must be made to execute health interventions and offer health advices, based on evidence gathered using these methods and other social science approaches.

IV. Advance planning

Risk communication 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 focused on preparedness, prevention and response. Planning should be sensitive to stakeholders' needs, participatory, responsive to the context of affected groups and should include feedback from such groups.

The International Health Regulations (IHR) require all governments to build national capacity for detection, alert and response to public health emergencies. One of the core capacities is risk communication. Accordingly, risk communication planning should include the systems required (strategies, plans, SOPS and mechanisms at the national, regional and district levels); the coordination of partners, sectors and stakeholders; the capacity for fast, effective public communication in the preferred languages and channels of the population; the ability to track and quickly manage concerns, perceptions, rumours and misinformation; and communication engagement with affected and at-risk communities.

V. Ensuring equity

All citizens have a right to appropriate information about health risks, including what needs to be done in response to threats to their health. Unfortunately, large segments of society are excluded from routine communication about threats to health. Risk communication must therefore ensure equitable sharing of information to the public and avoid exclusion of marginalized members of society from health action. This means paying attention to the reach of communication, using trusted channels and interlocutors; avoiding jargon or technical language; using the people's own languages and dialects; adapting messages to people's levels of understanding and education; and ensuring that the actions promoted are those that people can realistically change. Special attention should be paid to analysing power dynamics in communities and taking special measures to reach 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 at-risk populations

- (a) Establish risk communication systems and structures at the district, regional/provincial and national levels.
 - (i) If unavailable, establish multisectoral communication committees/structures across all levels; i.e., national, regional/province and district levels (See Annex 5E for examples of members of the communication subcommittee and their roles). TORs can be expanded depending on the pre-outbreak, outbreak and post outbreak phase in line with each function. See Annex 7F for an expanded list of possible stakeholders.
 - (ii) Review the existing risk communication structures and mechanisms.
- (b) Ensure that the communication system has a link to the community leadership structure since they wield great influence within the community. A quick assessment can be made to evaluate the framework for public health emergency risk communication and this can include:
 - (i) conducting an assessment to identify risk communication needs based on risk profile;
 - (ii) preparing a mapping and developing a database of risk communication stakeholders at all levels; and
 - (iii) preparing a resource mapping for risk communication.
- (c) Conduct mapping of languages and dialects; religions; preferred and trusted means/channels and interlocutors (sources) for communication; as well as traditional practices relevant to the top priority health risks and use all this information to shape risk communication strategies and plans.
- (d) If none is available at the district and regional/provincial levels, identify a government spokesperson and ensure that he/she is trained in public communication procedures.
- (e) 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).
- (f) Develop a risk communication plan for Public Health Emergencies at district, regional/provincial and national levels and ensure that key stakeholders are given some orientation on risk communication procedures.
- (g) Develop a coordination platform as well as internal and partner communication mechanisms for engaging key stakeholders, including media outlets and community radio networks and a definition of roles and responsibilities.

- (h) Have detailed budgets and advocate strongly for resources mobilization, and multisectoral collaboration to implement public health emergency and risk communication activities at all levels.
- (i) Create a system for dynamic listening and rumour management.

Note: See Annex 7E for checklist on risk communication monitoring.

7.4 Communicating before, during and after the outbreak

7.4.1 Pre-outbreak/Routine risk communication

A large proportion of communication activities should be implemented in the pre-emergency phase to ensure better preparedness. Those managing communication activities should take advantage of the absence of an emergency to build the national communication capacity and develop communication plans and tools that will bring the country to a high level of communication preparedness. The pre-emergency phase should also be used to develop the necessary communication messages and materials and promote the practice of risk-prevention behaviours.

Before an outbreak, the following should take place:

- Ensure that the Public Health Emergency Management Subcommittee for Risk Communication meets 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 IEC materials based on the common public health risk; and
 - organize the training of risk communication resource teams.
- Ensure that the communication coordination mechanism is in place with clear terms and well-defined roles and responsibilities for 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. These include district, regional/provincial or national media; community radios; civil society; and stakeholders from other sectors, like the animal health sector, in countries where zoonotic influenza are a priority threat.
- Review past emergency communication interventions to draw lessons learnt, build on successful practices and avoid negative ones.
- Collect and analyse epidemiological and social data about periodic disasters and outbreaks; outbreak seasons of common diseases; expected at-risk communities/populations; as well as accessible and credible channels of communication.

- Build capacity for outbreak communication and identify/train spokespersons to be ready when an outbreak occurs.
- Alert all relevant entities and notify them on their role(s) in case the expected outbreak occurs.
- Ensure that messages and materials have been developed, pre-tested and are ready for production and dissemination.
- Ensure that all required training modules, guidelines and monitoring checklists are developed and updated.
- Develop and share standard operating procedures (SOPs) for social mobilization and community engagement and ensure the integration of risk communication in the overall emergency response plan.
- Identify and prepare the database of stakeholders and partners, such as groups or organizations that focus on youth or women; schools; religious institutions; CSOs; theatre groups; and other community groups that can disseminate messages at the grassroots level and involve them in preparedness activities.
- Identify all the channels of communication available to spread the message and assess the reach and credibility of these channels.
- Produce a “Response Kit” which includes key frequently asked questions, media briefs, training manual, micro-planning tools, monitoring checklists/tools, communication plan templates and key IEC messages/materials for rapid distribution. This kit is intended for the use of communication practitioners at all levels.
- Establish communication lines with the media, journalists and radio/TV stations; train and regularly update them.
- Pre-arrange activities with theatre groups, musicians and traditional community entertainers.
- Identify and train community health workers, community leaders, religious leaders, influential people, women’s groups, youth groups and other social mobilizers in SBCC and risk communication.
- Identify mechanisms for communicating with hard-to-reach and vulnerable populations (the aged, persons with disabilities, children, the nomadic) and with isolated communities to ensure that they have access to health protection information and assistance.
- Define communication channels that can be used to reach vulnerable groups.
- Disseminate messages that describe the actions that the government is taking to protect the public and health care workers, promote awareness of the imminent health threats and preventive behaviours and actions that individuals, families and communities can take to reduce the risk. This can be done through the mass media, such as local community radios, public health addresses, community drama groups, television, print media and social media (Facebook, twitter, etc.).

- Conduct community engagement activities and build trusted relationships between those in authority and communities through training, dialogue, consultations and capacity-building. It is important to note that effective community engagement is based on trusted relationships between those in authority and communities. It is important, therefore, to use every opportunity to strengthen these relationships during non-emergency periods.
- Use ongoing health education, health promotion and other means to create, test and build trust in the systems. Interlocutors can be used for risk communication during emergencies.
- 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 a list of media houses.
- Develop plans for routine monitoring of misinformation and rumours and set up a media monitoring system to keep track of behaviours and practices related to the emergency.

Note that:

- It is important to integrate, to the extent possible, social science data that should be gathered as well. Data on the context and sociocultural information (including education, traditional practices, health-seeking and-health care behaviour, and beliefs) relevant to priority hazards and epidemic-prone disease should also be obtained. This will make it possible to contextualize epidemiological data and create risk-based real intelligence and thus tailor possible health interventions accordingly.
- 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 the local, regional/provincial or national media; community radios; civil society; and stakeholders from other sectors such as 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.

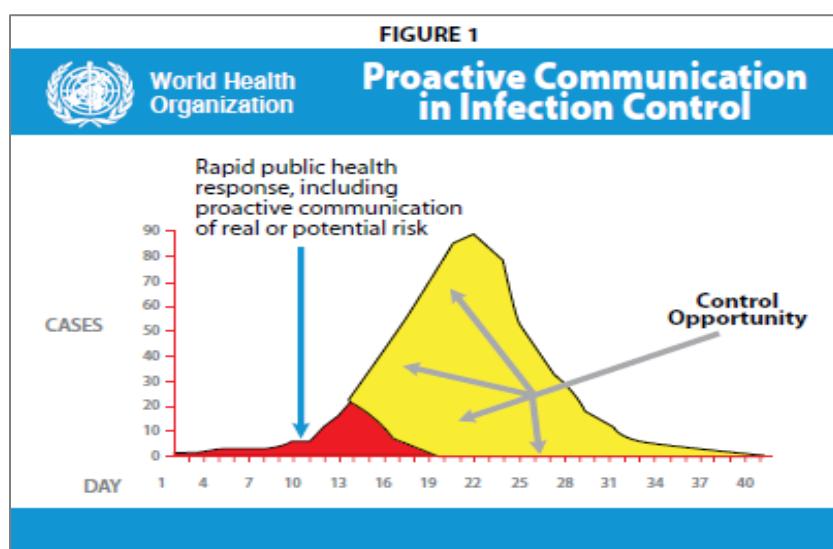
Proactive communication encourages the public to adopt protective behaviours, facilitates heightened disease surveillance, reduces confusion and fear and allows for a better use of resources, all of which are necessary for an effective response. Proactive communication also shows that health authorities are in control of the situation and care about the public. Hence, it builds trust between such authorities and the community at large.

People have a fundamental right to information and 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 7.1 illustrates a typical epidemic curve which tracks number of cases over time that could occur during an infectious disease outbreak. The yellow area represents the number of cases which could be avoided through the control opportunity of a rapid response to the threat.

The blue arrow indicates the point at which proactive communication plays a crucial role in supporting such a rapid response. By alerting a population and partners to an infectious disease risk, surveillance of potential cases increases, protective behaviours are adopted, confusion is limited and communication resources are more likely to be focused. Effective communication can help limit the spread of a disease and ultimately save lives. It also minimizes damage to societies and economies and can help communities recover faster from a health event or emergency.

Figure 7.1: Epidemic curve showing the importance of proactive communication



7.4.2.1 Identify and coordinate partners and other stakeholders during an outbreak

Outbreaks usually create fear in the community. The involvement of several different stakeholders sometimes leads to lack of coordination and the duplication of efforts. Provision of timely and accurate information through a well-coordinated mechanism is important.

Internal coordination of communication among national stakeholders is crucial during an emergency. The Risk Communication and Social Mobilization Subcommittee described in Section 5 is responsible for ensuring that an internal communication system is established among national stakeholders to ensure the timely flow of information to various government sectors.

Partner coordination is another key essential element during outbreak and event response and is aimed at fostering ownership, effective participation of key players and efficient use of resources. See Annex 7F for the potential partners and stakeholders who can be involved. It establishes routine communication structures among health workers, community and partners. It helps ensure that this vital link is available and functional during an emergency. If a district, region/ province 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, thereby promoting trust and the likelihood that expert advice will be followed.

The PHEMC through the PHEOC or through a similar coordination structure at national level may take responsibility for ensuring that communications are consistent and reflect the data that has been analysed. Ensure that the focus of communication activities is transparent and accurate, and take into account community experiences and expectations regarding the outbreak.

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, as well as adapting materials, messages and mechanism to suit each of them is essential.

7.4.2.2 Communicate with the affected community and stakeholders

Communication with affected communities and stakeholders, including the media is essential during outbreak and event response. Thus, establishing routine communication structures and processes between the health and community partners helps to ensure that this vital link is available and functional during an emergency. Options for communicating between the various partners can range from press releases, press conferences, television and radio messages, meetings (health personnel, community, religious, opinion and political leaders), educational and communication materials (posters, fliers), to multimedia presentations (films, video or narrated slide presentations) at the markets, health centres, schools, women's and other community groups and service organizations, religious centres, local community media, Social media (Facebook, Twitter, WhatsApp, etc.), SMS, telephone, hand-carried message, community drama groups/play groups; site visits; fax, email updates and exchanges of communication materials through more formal decision-making committees. Regardless of the mechanism, ensure that the focus is on transparent and trustworthy communication that considers community experiences.

Consider the following points when preparing messages:

- **Make sure messages are clear and understandable to the audience:** What is happening? Why and how is it happening? What threats to health do exist or are likely to occur? What should the public do? Where can people get services or information? What assurances can be given? Are the messages written in an understandable language and tailored to the audience's level of understanding? Research shows that risk should not be explained in technical language.
- **Consider these factors when providing messages:** Who is your audience? What do you want your audience to do after hearing the message? Do they have an enabling environment to do as advised? Are there functioning and accessible services that enable them to follow the advice?
- **Promote dialogue:** Ensure that there is two-way communication/exchange; listen to the audience's concerns and respond appropriately rather than just informing.
- **Demonstrate empathy and be caring:** Are you showing empathy for their suffering? Are you being too cold and clinical? Are you respectful?
- **Provide harmonized and consistent messages:** Ensure that consistent messages reach the public, notwithstanding the variety of partners involved in the dissemination of information. Use message maps and other tools to keep the same frame and logic for the messaging as this would enable partners to adapt to the context of more segmented audiences. Are messages consistent regardless of who is issuing them? Inconsistent or conflicting messages create confusion and destroy trust in the response and authorities.

- Establish a mechanism for continuous collation of facts and figures about the public health event.
- Update public information messages and share them with stakeholders involved in information dissemination.
- Ensure relevance: Communicate data/information that best illustrate your point, factoring in community concerns. Use examples that relate to the audience.

NB: Consider pre-testing messages from similar settings before dissemination.

In case of rumours, quickly address them and any inaccuracies in general and especially within the specific community where they occur. Consider setting up a rumour monitoring system.

Widespread damaging rumours should be counteracted through public statements or press conferences. Provide comprehensive information to prevent rumours being generated from your response.

Build, maintain and restore trust as you communicate 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 periods.

On a regular basis, district and regional medical officers should meet with the local leaders to provide:

- frequent, up-to-date information on the outbreak and response;
- clear and simple health messages for the media;
- clear instructions to communicate to the media only the information and health education messages provided by the PHEMC.

7.4.2.3 Distribute IEC material and develop fact sheets

Fact sheets are brief summaries of 1 to 2 pages. They are usually prepared by health staff for consumption by the general public and deal with a single topic or message. For example, a fact sheet on a *Shigella* outbreak in a district may contain the following information for the community: the cause of *Shigella*, how it is transmitted, 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), scripts or visual products (like posters or infographics). These can be used depending on the preference of the audience (oral or visual/written/illustrated communication). See attached example in the Annex 7A.

Also distribute other prepared IEC materials. Ensure that they have been pre-tested with the target audience to ensure comprehension and meaning.

7.4.2.4 Develop and distribute public health situation reports during outbreaks

In many countries, the national level or the region/province publishes a national public health bulletin. Rather than being published only during outbreaks, these bulletins should be produced more regularly and describe the outbreak, including trends; i.e., situation reports (Sitrep). These situation reports or bulletins have a wider audience than just the health staff in a particular district or health facility. They are usually brief (2 to 8 pages) and are also read by policymakers, legislators and other decision-makers. They are valuable channels for reaching technical and donor partners.

The bulletins contain at least:

- (a) a summary table showing the number of reported cases and deaths to date for each priority disease;
- (b) a commentary or message on a given disease or topic;
- (c) any relevant social science data on risky practices, behaviours and other factors.

If a national public health situation report is sent to the district office, display it where everyone can see it. Make copies and distribute to health facility staff. Take a copy of the report with you on your next supervisory visit to show health workers how data produced during outbreak contributes to public health. A sample template for preparing a situation report is presented in Annex 7C.

7.4.2.5 Communicating to the 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 rely on facts and evidence. Therefore, it is essential to meet regularly with the media, brief and educate them on priority hazards and response systems, and also provide them with appropriate information so as to cultivate a respectful and trusted relationship with them. The media will ensure wider dissemination of messages on radio or other appropriate channels.

As part of your risk communication plan, determine how you will announce news of the outbreak and then keep the media regularly informed. Often, regular press releases and media briefings are appropriate tools for communicating with the media. If the emergency is complex,

convening a workshop with targeted media is helpful to ensure correct information is disseminated, as most journalists have not been trained in medicine or public health.

In addition, it is good to develop media kits which could include fact sheets and community messages about the priority diseases and events.

Prior to the outbreak, ensure that you have reached out to the media and identified the key outlets you will need to work with during an outbreak. It is also good to identify, prior to an emergency, the clearance process for media products and appreciate the following:

- Ensure prompt and frequent access to experts, officials and spokespersons who will speak authoritatively and credibly on the issue at hand.
- Provide media training to spokespersons.
- Spokespersons should be able to speak in layman's language; clearly explain scientific ideas and terms; avoid speaking in jargon; and illustrate the information provided with easy-to-understand stories or examples. Talking points having the latest information could be used, with the messages kept as simple as possible. Ensure that the identified spokespersons are able to clearly communicate the uncertainty in an evolving event and to admit it when they do not know something. Community case definitions and job aids will help the spokesperson to deliver correct messages.
- Promptly answer journalists' calls to show your respect for them.
- Provide them with accurate and well-explained information.
- Give exclusive stories and interviews to provide a different perspective.
- Provide human interest stories.
- Give them clear easy-to-use handouts (written, audio, visual or audiovisual).

NB: Release information to the media only through the spokesperson to make sure that the community receives clear and consistent information.

Monitor the media daily to see how the outbreak is being reported. Include social media in your monitoring strategy. If you feel that the wrong messages are being disseminated, devise a strategy for correcting this misinformation.

7.4.2.6 Communicating to health workers

Communicate regularly with health workers by providing correct information pertaining to the outbreak. It is important to communicate with health staff at the various levels about the data sent (including any gaps), analysis results for such data and the measures being taken to respond

to the potential public health event which they have reported. Communication can also include providing participating health care workers with any outbreak or event response reports for future reference.

Make sure that health workers provide correct information on number of cases and any deaths that have occurred. Also make sure you provide any changing information on case management or any other response intervention.

Encourage health workers to keep updated information and to update it in real-time during an event or emergency using reliable sources such WHO's knowledge transfer platform (www.OpenWHO.org) on common, re-emerging and emerging epidemic-prone diseases 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 health care workers and response teams. These provide an opportunity to update or acquire knowledge and skills.

7.4.3 Post-outbreak response

7.4.3.1 Prepare an outbreak or event response report

After an outbreak or event response has taken place, district staff who led the investigation should prepare a report. The purpose of the report is to document how the problem was identified, investigated, responded to; what the outcome was; which decisions were taken and what recommendations were made. Make sure that the health unit that reported the initial cases receives a copy of the report. See Annexes 7B and 7D at the end of this section for examples of recommended formats and samples.

7.4.3.2 Evaluate lessons learnt in order to strengthen appropriate public responses to similar emergencies in the future.

- (a) Assess the effectiveness of the communications team in each phase and area of work.
- (b) Assess the effectiveness of meetings.
- (c) Assess the effectiveness of the internal flow of communications.
- (d) Assess the monitoring of communications and of the media.
- (e) Assess the response of the communications media.
- (f) Assess the outputs and outcomes of risk communication and community engagement

7.4.3.3 Periodic testing of the risk communication plan

Carry out simulations to test the risk communication plan in order to detect possible weaknesses or gaps that need to be corrected before an emergency. Revise the plan based on lessons learnt from the simulation exercise, AAR or other assessment done.

WHO provides ready-made desktop and other simulation exercises on the www-OpenWHO.org

7.5 Annexes to Section 7

Annex 7A Sample fact sheet

Annex 7B Sample district 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 diseases 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 adaptation 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 those 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 vaccines 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 coinfection with human and avian influenza A viruses.

Because rare episodes of limited, non-sustained human-to-human transmission of HPAI H5N1 virus have been reported, persons should avoid sick patients who have suspected or confirmed HPAI H5N1 virus infections. 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 district outbreak report

Title/Description (include disease/condition investigated) _____

Period _____ Place (village, neighbourhood, district, province) _____

Executive summary: _____

I. Introduction:

- Background
- Reasons for investigation (public health significance, threshold met, etc.)
- Investigation and outbreak preparedness

II. Methods:

- Dates of investigation
- Site(s) of investigation (health care facilities, villages, other)
- Case finding (indicate what was done regarding case finding, e.g., register review, contact investigation, alerting other health facilities, other)
- Lab specimen collection
- Description of response and intervention (include dates)
- Data management

III. Results:

- Date and location of first known (index) case
- Date and health facility where first case was seen by the health care system
- Results of additional case finding
- Lab analysis and results
- With text, describe key features of results of time, place and person analysis
- Detailed results by time (epi curve), place (map), and person characteristics (tables) and line lists
- Results of response and evidence of impact

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

Epidemic preparedness

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

Outbreak detection

Indicator	Date 1	Date 2	Interval
Interval between onset of index case (or occurrence of an unusual cluster at the community level) [date 1] and arrival of first outbreak case at the health facility [date 2] (Target: <3 days)			
Interval between initial outbreak case seen at the health facility (or date of outbreak threshold crossing at the health facility) [date 1] and reporting to the district health team [date 2] (Target: within 24 hours)			
Cumulative interval between onset of index case (or occurrence of an unusual cluster at the community or health facility) [date 1] and notification to the district [date 2] (Target: <7 days)			

Outbreak investigation

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

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

Outbreak response:

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

Evaluation and Feedback:

Indicator	Date 1	Date 2	Interval
Interval between end of the outbreak [date 1] and finalization of outbreak report with case forms/line list sent to national level [date 2] (Target: 2 weeks)			

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

V. Evaluation of other aspects of the response:**VI. Interpretations, discussion, and conclusions:****VII. Recommended public health actions:**

Comment on following levels: community, health facility, district, partners, provincial and national

District Public Health Emergency Management Committee Chairperson:

Name: _____ Signature _____

District Medical Officer:

Name: _____ Signature _____

Date report completed: _____

Annex 7C: Template for preparing public health event situation report

District epidemiological week _____ Week ending (date)_____

I. Epidemiological situation: Week (insert week number and date here) _____

Table 1: Epidemiological situation: Week _____

Disease	Cases	Deaths	Fatality (%)	Districts in alert	Districts in epidemic	Reported week	Timeliness (%)	Completeness (%)
D1								
D2								
Dn...								
Total								

Comments:

Contact us:

II. Synthesis of the epidemiological situation (insert the weeks being reported on here)

Table 2: Epidemiological situation: Weeks _____

Districts	Cases	Deaths	Fatality (%)	Districts in alert	Districts in epidemic	Reported week	Timeliness (%)	Completeness (%)
D1								
D2								
Dn								
Total								

Comments:

Contact us:

III. Graphs (This section provides a graphical representation of data)

IV. Epidemic trends

Annex 7D: Outbreak investigation report sample

INVESTIGATION OF ANTHRAX OUTBREAK IN KILIMANJARO REGION, DECEMBER 2015–JANUARY 2016

1. INTRODUCTION

Anthrax is an acute illness caused by *Bacillus anthracis*, a Gram-positive, encapsulated, spore forming and non motile bacteria. The disease commonly affects wild and domestic herbivores, human and carnivores are incidental hosts. Three occurrence forms of the disease in human include cutaneous, inhalation and gastrointestinal anthrax. The disease can be transmitted through the intestine (ingestion), respiratory tract (inhalation) and skin (cutaneous) from infected animal tissues and from infected persons.

The worldwide estimate of the disease burden is not well known; however, occasional epidemics do occur (WHO 2005).

An outbreak of anthrax in Marangu, Moshi DC in Kilimanjaro Region was reported to the Ministry of Health and Social Welfare (MOHSW) by the Kilimanjaro Regional Medical Officer. Hence, there was a need to carry out an investigation to ascertain what was happening in the affected district.

Objectives of the outbreak investigation

The objectives of the investigation were to:

- (a) confirm and determine the magnitude of the outbreak by actively searching for cases;
- (b) characterize the outbreak in terms of time, place and persons;
- (c) identify the source of infection through collection of both animal and clinical samples;
- (d) generate and test the hypotheses of the outbreaks; and
- (e) come up with recommendations and assist the district teams in the response and control of the outbreak.

Hypothesis for the anthrax outbreak at Moshi Rural District

- The slaughtering of a dead cow killed by anthrax is associated with contracting of the disease in humans.
- The handling/eating of meat from a dead cow killed by anthrax is associated with contracting of the disease in humans.

2. METHODOLOGY

This was a cross sectional study that involved the patients presenting with signs and symptoms for anthrax who were either admitted or at home. Active case search in the community was done to identify the cases. Clinical samples were collected and transported to the laboratory for confirmation.

Study area: The suspected anthrax outbreak occurred in Rauya Village in Marangu Mashariki Ward and Mae Juu Village in Siha District; both districts are located in Kilimanjaro Region in Tanzania.

Places visited

We identified the homes of the cases that sought treatment from the Marangu and Siha health facilities, with the assistance of the Kilimanjaro Regional Health Officer, District Health Officers (Moshi DC and Siha), District Veterinary Officers (Siha and Moshi DC) and Community leaders. We visited two most affected villages i.e. Mae Juu and Rauya.

Study period: The outbreak investigation was carried out from 8-14 January 2015

Case definition used:

Case definition: The standard case definitions used to identify the cases were:

Suspected anthrax case	IF THERE IS AN ANTHRAX EPIDEMIC: Any resident of Marangu presenting with a clinical illness and who is epidemiologically linked to a confirmed or suspected animal case or contaminated animal product from 12 December 2015
Probable anthrax case definition	Any resident of Marangu presenting with cutaneous ulcers developing within two weeks of contact with a sick or dead animal, confirmed to have anthrax or dying of unknown diseases since 12 December 2015
Confirmed anthrax case definition	A suspected case or a probable case in whom laboratory testing confirms <i>Bacillus anthracis</i> by Gram Staining or culture or PCR

Data collection methods

Semi structured questionnaires were used to collect information from patients and their families. Where the patient was not available or could not speak, a knowledgeable proxy was used.

3. FINDINGS

Rauya Village, Moshi DC, Kilimanjaro Region

The index case reported at the Rauya RC Dispensary on 6/12/2015. The index case (Erasto Kingstone) was a male aged 39 years living in Rauya Village in Marangu Mashariki Ward. The index case is the son of the owner of the dead cow. (This family had one cow and one goat). The outbreak is said to have occurred after the slaughter of the dead cow. It was noted that the cow died on 3/12/2015. The family did not

notify the veterinary officer for inspection. The cow was slaughtered at home by Erasto with the help of a neighbour called Elibariki who also distributed the meat to relatives and neighbours. The cow skin was given to the dogs. The next day (4/12/2015) the index case was cutting open the head of the dead cow when he accidentally pricked one of his fingers with a cow bone. On 6/12/2015, the index case had a swollen finger (the pricked finger). On 7/12/2015, the goat died and was slaughtered by the index case. The goat meat was eaten by only the family members. On 8/12/2015 the index case realized that the pricked hand was swollen and he was rushed to Marangu RC Hospital. Suspecting the patient to have anthrax, the doctor administered amoxilin to the patient for five days as well as pain killers. After a few days without recovery, the patient returned to the hospital on 12/12/2015 and presented with swelling on the right upper limb and chest, massive of the RUL and chest with eschar on the wound. The hospital in charge referred him to Marangu Lutheran Hospital where he was also referred to KCMC Hospital.



Photo 1: A photo showing a lesion on the hand of the index case identified in Rauya Village, Moshi, Kilimanjaro Region

Mae Juu Village, Siha District, Kilimanjaro Region

The first case in Siha District was reported on 17/12/2015. This was a male, 25 years of age, living in Mae Juu Village in Siha District. This case was brought unconscious to the Siha health facility, with blisters and lesions on his arms. This case was involved in selling the meat of a dead cow that was slaughtered.

The community was notified of the presence of an anthrax outbreak on 22/12/2015. They were also informed that those who might have had contact with or eaten the infected meat should go to the hospital. From 23/12/2015 to 28/12/2015, a total of 760 people presented at the hospital and were all treated with doxycycline (7days) or amoxilin (5 days).

In Siha District there were four deaths of cows that were identified. The team was able to trace three cows that had died, were slaughtered and the meat sold at one of the butcheries. It also found that the meat was not inspected by the veterinary officer. One household had had its cow inspected, but we found that the person who inspected the cow was an artificial inseminator who had no knowledge on how to inspect cows, and not a veterinary officer.

A total of 904 contacts linked to the infected meat were obtained (68 were linked to the dead cow in Rauya Village, Moshi DC and a total of 836 contacts were obtained in Siha District). Of the total 904 contacts, 23 subjects met the standard case definition and there were no deaths reported. The median

age for the cases was 36 years with the youngest being 1 year old and the oldest being 98 years old. The 10-19 years age group constituted 29.1% of the cases. Other social demographic characteristics of the contacts and cases are as shown in Tables 1 and 2 below.

Table 1: General characteristics of the study subjects of the anthrax outbreak in Kilimanjaro Region

Variable	Number	Percentage	95% CI
Gender			
Male	427	47.2	44.0, 50.6
Female	477	52.8	49.4, 56.0
Occupation			
Peasant	128	14.1	11.9, 16.5
Formal employment	138	15.3	13.0, 17.8
Unemployed	85	9.4	7.6, 11.6
Student	314	34.8	31.7, 38.0
Cattle keeper	113	12.5	10.5, 14.9
Others	126	14.0	11.8, 16.4
Educational level			
Uneducated	91	10	8.1, 12.2
Primary education	480	53.2	49.8, 56.4
Secondary education	237	26.2	23.4, 29.3
Tertiary education	96	10.6	8.7, 12.9
Age group			
0 to 9 Years	157	17.5	15.1, 20.2
10 to 19 Years	233	26.1	23.2, 29.1
20 to 29 Years	108	12.1	10.1, 14.4
30 to 39 Years	80	9.0	7.2, 11.1
40 to 49 Years	111	12.4	10.4, 14.8
50 to 59 Years	83	9.3	7.5, 11.4
60 and above	122	13.6	11.5, 16.1
Place of residence			
Mae Juu Village, Siha District	836	92.5	90.5, 94.1
Rauya Village, Moshi DC	68	7.5	5.9, 9.5

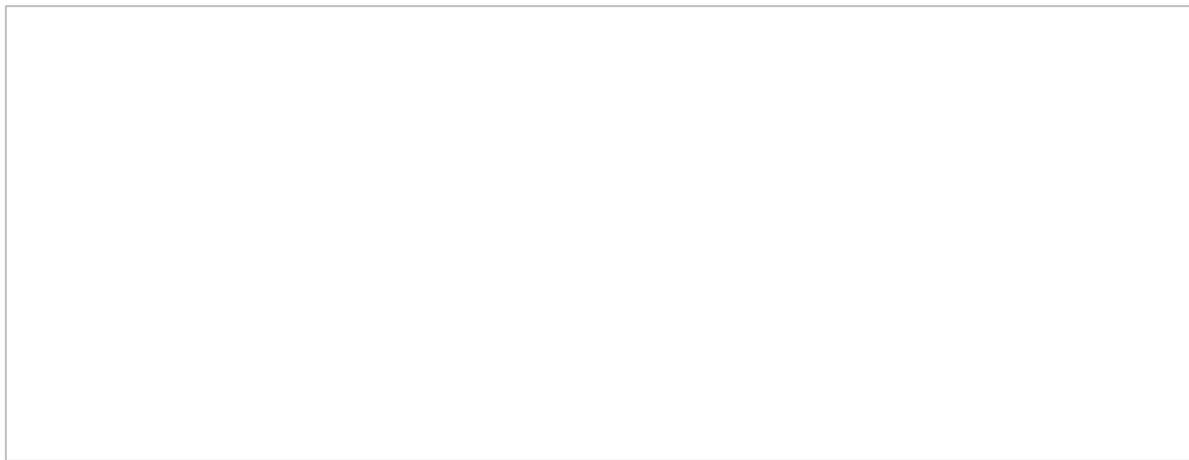
Others includes those who were not available physically for the interview under five children.

Table 2: Social demographic distribution of anthrax cases in the Kilimanjaro Region, January 2016

Variable	Number	Percentage	95% CI
Gender			
Male	13	60.9	34.0, 90.6
Female	8	39.1	9.9, 65.1
Occupation			
Peasant	4	17.4	1.9, 36.5
Un employed	6	26	7.6, 41.6
Student	5	21.7	6.7, 48.0
Cattle keeper	8	34.9	10.5, 54.9
Educational level			
Uneducated	2	8.7	1.1, 22.2
Primary education	11	47.9	29.8, 66.4
Secondary education	4	17.4	3.4, 39.3
Tertiary education	6	26.1	8.7, 42.9
Age group			
0 to 9 Years	2	8.7	2.1, 20.2
10 to 19 Years	5	21.7	6.2, 49.1
20 to 29 Years	6	26.1	10.1, 44.4
50 to 59 Years	4	26.1	7.5, 41.4
60 and above	6	17.4	3.5, 36.1
Place of residence			
Mae Juu Village, Siha District	19	82.6	65.5, 99.1
Rauya Village, Moshi DC	4	17.4	1.9, 39.5

Table 3: Case classification, anthrax outbreak, Kilimanjaro Region, January 2016

	Cases classification	Number	Percentage
1	Suspected	10	43.5
2	Probable	11	47.8
3	Confirmed	2	8.7

Figure 1: Epidemic curve, anthrax outbreak, Kilimanjaro Region, January 2016

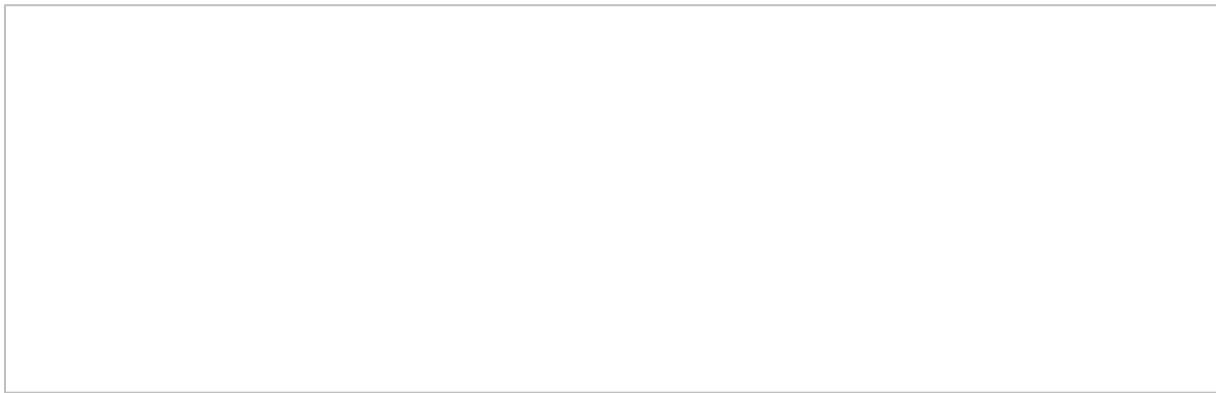
The epidemic curve shows that the first cow died in Rauya Village on 3/12/2015 and the first human case that was involved in slaughtering the dead cow developed symptoms on 6/12/2015. The peak of the outbreak was on 22/12/2015. The last case was reported on 28/12/2015. Of all the potential exposures indicated in Table 4 below, slaughtering and meat handling were significantly associated with an increased risk of acquiring the disease.

Table 4: Potential risk exposure for acquiring anthrax disease in Kilimanjaro Region, January 2016

		Prevalence Odds Ratio	95% CI	P value
1	Involved in slaughtering the cow	5	1.2, 23.5	0.01
2	Involved in handling the meat	3.2	0.9, 11.3	0.02
3	Contact with a dead cow, goat (burial)	2	0.7, 10.5	0.2
4	Eating the meat	7.6	2.2, 18.9	0.07
5	Contact with other animal products (skin, milk)	1.7	0.3, 15.6	0.6

Disease characterization

The period from the exposure of the dead cow to the onset of symptoms ranged from 2 to 15 days with the mean of 7.6 days. Among the 23 patients of anthrax, 3 (13%) were hospitalized. Infectivity rate was 23/904 (2.5%). The most presenting symptoms was fever as shown in Figure 2 below.



Other findings

- (a) The national team worked hand in hand with veterinary officers who claimed that there were a lot of unvaccinated cattle. Hence, the vaccination coverage is quite low; few cows within the village were presented for vaccination. The community indicated that it could not afford the vaccination fee of 2000 Kenyan shillings per cow and 1000 shillings per goat.
- (b) The community was not well informed on anthrax and how to handle sick and dying animals.

Measures taken

- Quarantine of meat and meat products imposed in the affected areas.
- Vaccination of cows against anthrax and focused on the affected wards.
- Provision of education to the community through village meetings, churches, mosques and schools. Community leaders were present to address the crowd.
- All cases presented to the hospital with cutaneous lesions were treated and prophylaxis was given to all identified contacts (prophylaxis of Doxycycline (7 days) or Amoxillin (5 days)).
- Officers from the DVO, DHO and the Ministry of Health and Social Welfare held a joint meeting as more discussions arose on different interventions.
- Disinfection of cow sheds and slaughter sites using limestone powder.

4. CHALLENGES

- Vaccination coverage was quite low, few cows within the villages were presented for vaccination. This stemmed from the shortage of vaccines.
- The community was not well informed on anthrax and how to handle dying animals.
- There are no close links between the RMO/DMO and the DVO except when zoonotic outbreaks emerge.

5. RECOMMENDATION

- The veterinary sector should intensify vaccination programs by increasing coverage and providing regular and timely vaccines to livestock especially against epidemic-prone zoonotic diseases.
- The community should be well informed on anthrax and other zoonotic diseases and how to handle dying animals.
- There should be a close link between the RMO/DMO and the DVO in dealing with zoonotic diseases. This will promote the one-health approach.
- Preliminary diagnostic tests for animals should be the starting-point before anything else. Such tests will provide the clue for identifying the event.

6. CONCLUSION

The outbreak of Anthrax in the Kilimanjaro Region was established through the laboratory confirmation of human and animal cases. All the cases were linked to the dead cows, making them the cause for the outbreak. Slaughtering of the dead cows and handling of their meat were the major risk factors for transmission of the disease to humans. The outbreak was declared over on 14 January 2016.

Annex 7E: IHR Core capacity for monitoring risk communication

IHR Core Capacity Monitoring Questionnaire: Risk Communication
1. Have risk communication partners and stakeholders been identified?
2. Has a risk communication plan ^A been developed?
3. Has the risk communication plan been implemented or tested through actual emergency or simulation exercise and updated in the last 12 months?
4. Are policies, SOPs or guidelines developed on the clearance ^B and release of information during a public health emergency?
5. Are regularly updated information sources accessible to media and the public for information dissemination? ^C
6. Are there accessible and relevant IEC (Information, Education and Communications) materials tailored to the needs of the population? ^D
7. In the last three national or international PH emergencies, have populations and partners been informed of a real or potential risk within 24 hours following confirmation?
8. Has an evaluation of the public health communication been conducted after emergencies, for timeliness, transparency ^E and appropriateness of communications, been carried out?
9. Have results of evaluations of risk communications efforts during a public health emergency been shared with the global community?

Notes:

- A. Plan includes inventory of communication partners, focal points, stakeholders and their capacities in the country
- B. Procedures in place for clearance by scientific, technical and communications staff before information is released during public health events
- C. This may include website/webpage (national level), community meetings, radio broadcasts nationally as appropriate etc.
- D. The views and perceptions of individuals, partners and communities affected by public health emergencies should be systematically taken into account; this includes vulnerable, minority, disadvantaged or other at-risk populations.
- E. Transparency here implies openness, communication and accountability, i.e. all information about public health risk is open and freely available.

Annex 7 F: List of Stakeholders and Partners for risk communication

Ministry 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
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
Africa Centres for Disease Prevention and control (Africa CDC)
US Centres for Diseases Prevention and Control (CDC)
Médecins Sans Frontières (MSF)
RED CROSS
Nongovernmental Organizations (NGOs)
Faith based organizations
Medical Associations

7.6 References

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9. http://www.who.int/csr/resources/publications/WHO_CDS_2005_31/en/
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