INTEGRATED DISEASE SURVEILLANCE AND RESPONSE TECHNICAL GUIDELINES

THIRD EDITION

SECTION 6: RESPOND TO OUTBREAKS AND PUBLIC HEALTH EVENTS

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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, s*higella* 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 indicate below:

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

(a) More than one IV line may be necessary to give the first bolus treatment.

(b) When IV rehydration is not possible and the patient can't drink, ORS solution can be given by nasogastric tube.
   - Do not use nasogastric tubes for patients who are unconscious or vomiting.

(c) When possible, fluid output should be measured and equivalent volumes added to the amount described for initial treatment.

(d) Monitor the patient closely and perform frequent reassessment (every 15-30 min).

(e) If hydration is not improving, give the IV drip more rapidly. 200ml/kg or more may be needed during the first 24 hours of treatment.

(f) After 6 hours (infants) or 3 hours (older patients), perform a full reassessment. Switch to ORS solution if hydration is improved and the patient can drink.

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

Antibiotic treatment

(g) The laboratory should be asked about patterns of resistance of the strain at the beginning of and during the outbreak and adapt the treatment accordingly.

(h) Antibiotics should be given only in severe cases, to reduce the duration of symptoms and carriage of the pathogen.

(i) Antibiotics are given as soon as the patient is able to take oral medication (once vomiting has stopped):
   (i) Doxycycline: single dose (300mg for adults; 2-4 mg/kg for a child between 1 and 14 years of age), is antibiotic of choice for all patients, including pregnant women.
   (ii) If there is resistance to doxycycline, use azithromycin (1 g orally as a single dose for adults and 20 mg/kg (max 1g)) orally as a single dose for children < 12 years.

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

Plan B: Oral rehydration for patients with some dehydration

(a) Patients presenting with some signs of dehydration must be admitted to the CTC/CTU.

(b) Initial treatment, give ORS according the weight of the patient (75ml/kg in the first 4 hours).

(c) Cholera patients with some signs of dehydration do not need IV fluid replacement, but they need to be monitored closely during the first 4 hours:

(i) If at any time signs of severe dehydration appear then shift immediately to Treatment Plan C.

(ii) If there are still some signs of dehydration after the first 4 hours, repeat Treatment Plan B for 4 hours and reassess.

(iii) If there are no signs of dehydration after the first 4 hours of treatment, then patients can be sent home with the same instructions described above under Treatment Plan A.

(d) If the patient vomits while taking fluid, wait 10 minutes. Then allow the patient to resume feeding, but more slowly.

(e) Continue monitoring the patient and replacing fluid until the diarrhoea stops.

(f) When the patient is ready to leave the facility, counsel the patient on treating diarrhoea at home.

(g) Refer to IMCI guidelines for treating children under 5 years of age and to national guidelines for further information on treating acute watery diarrhoea and confirmed cholera.

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

(a) Patients with no signs of dehydration should be treated with oral rehydration solution (ORS).

(b) There is no need to admit the patients with no signs of dehydration to the CTU/CTC. They can be treated with ORS at home, at ORPs or at the outpatient area at the health facility.

(c) If patient is seen at the health facility, keep the patient for observation for 2-4 hours to ensure they are tolerating ORS.

(d) During observation and before sending home, provide clear instructions for care. Advise patients or caregivers to continue giving ORS after each loose stool and to come back immediately if condition deteriorates (repeated vomiting, number of stools increased or if the patient is drinking or eating poorly).

(e) ORS must be prepared with safe water (boiled or treated with a chlorine product 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 proving care and after handing any soiled items such as clothes or linens.
- Cook food thoroughly and eat it while it is still hot.
- Remove and wash any bedding or clothing that may have had contact with diarrhoeal stool with the appropriate chlorine solution (0.02%). If chlorine is not available, patients' bedding and clothing can be disinfected by stirring them for 5 minutes in boiling water and drying in direct sunlight, or by washing with soap and drying it thoroughly in direct sunlight.
- Use a flush toilet or approved septic system; double bag soiled materials when discarding in trash.
- Use any household disinfectant or a 1:10 dilution of bleach solution (1part bleach to 9 parts water) to clean any area that may have contact with faecal matter, as soon as possible after being soiled.
- If a household member develops acute, watery diarrhoea, administer oral rehydration solution (ORS) and seek health care immediately.
- While caring for persons who are ill with cholera, do not serve food or drink to persons who are not household members.
- Visitors can be allowed if the ill person wants company; visitors should also observe hand hygiene recommendation.
- Give patients information about home care before they leave the health facility on danger signs and when to return to the facility again. Patients should return for treatment if they develops any of the following:
  - increased number of watery stools;
  - eating or drinking poorly;
  - marked thirst;
  - repeated vomiting;
  - fever;
  - blood in the stool.

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

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

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

Give vitamin A to children with measles

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

AGE	**Vitamin A Capsules**		
	200 000 IU	100 000 IU	50 000 IU
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:** • Excreta • Cadavers • Spills of infectious body • Fluids	**To make a 1:100 solution for disinfecting:** • Gloved hands • Bare hands and skin • Floors • Clothing • Equipment • Bedding
Household bleach 5% active chlorine	1 litre bleach per 10 litres of water	100 ml per 10 litres of water, or 1 litre of 1:10 bleach solution per 9 litres of water
Calcium hypochlorite powder or granules 70% (HTH)	7 grams or ½ tablespoon per 1 litre of water	7 grams or ½ tablespoon per10 litres of water
Household bleach 30% active chlorine	16 grams or 1 tablespoon per 1 litre of water	16 grams or 1 tablespoon per10 litres of water

To disinfect clothing:

(a) Promptly and thoroughly disinfect patient's personal articles and immediate environment using one of the following disinfectants:
- Chlorinated lime powder;
- 1% chlorine solution;
- 1% to 2% phenol solution.

(b) Promptly and thoroughly disinfect patient's clothing:
- Wash clothes with soap and water;
- Boil or soak in disinfectant solution;
- Sun dry;
- Wash utensils with boiling water or disinfectant solution;
- Do not wash contaminated articles in rivers or ponds that might be sources of drinking water, or near wells.

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

$$\frac{\%\ \text{Chlorine in bleach ((}\textit{Market/Shelf}\text{)}}{\%\ \text{Chlorine desired}}\ \textbf{minus}\ 1 = \text{Parts of water for each part of bleach}$$

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

$$\frac{5}{2}\ \textbf{minus}\ 1 = (2.5)\ \textbf{minus}\ 1 = \textbf{1.5}\ \text{parts water for each part of bleach}$$

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.

X **x 1.20 =**

Size of target population | *Number of recommended doses* | *wastage* | *Number of doses to order including wastage*

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.

_____ **X** **1.25** **=**

Number of doses | *Contingency factor* | *Total number of estimated doses including wastage*

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).

_____ ÷ _____ =_____

Total number of estimated doses | *Doses per vial* | *Total number of vials required*

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

_____	X	_____	=	_____
Diluent required		*Total number of vial*		*Total diluent to order per vial*

7. Estimate the number of sterile needles and syringes that will be needed to carry out the activity. If single-use needle and syringes are used, order the same amount as for the estimated number of doses in Step 4.
8. In addition, estimate the number of dilution syringes necessary for preparing the vaccine. Source: Field Guide for Supplementary Activities Aimed at Achieving Polio Eradication, World Health Organization, Geneva 1997. 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 shilled 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.

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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?

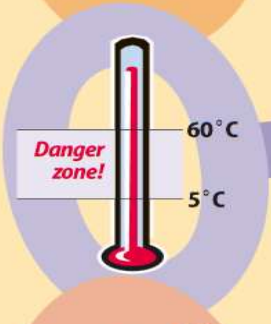
Raw food, especially meat, poultry and seafood, and their juices, can contain dangerous microorganisms which may be transferred onto other foods during food preparation and storage.

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.

Design: Marilyn Longhirst. Illustration: Jozef Nettykrova

Food Safety
World Health Organization

Knowledge = Prevention

WHO/SDE/PHE/FOS/01.1
Distribution: General
Original: English

Safe disposal of human waste

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

Community messages should emphasize 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. It you don't have one – build one!
- Keep the toilet or latrine *clean.*
- *Wash your hands* with soap (or ash) and clean water after using the toilet or latrine.

KEEP IT CLEAN: USE A TOILET OR LATRINE

Clean drinking water and storage

Community drinking water supply and storage

1. *Piped water:* To maintain safety, 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 to12 months, depending on the insecticide used and the type of surface on which it is sprayed.

Annex 6G: Outbreak communication

Introduction

Following confirmation and verification of the event, the 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 jewelleries (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.

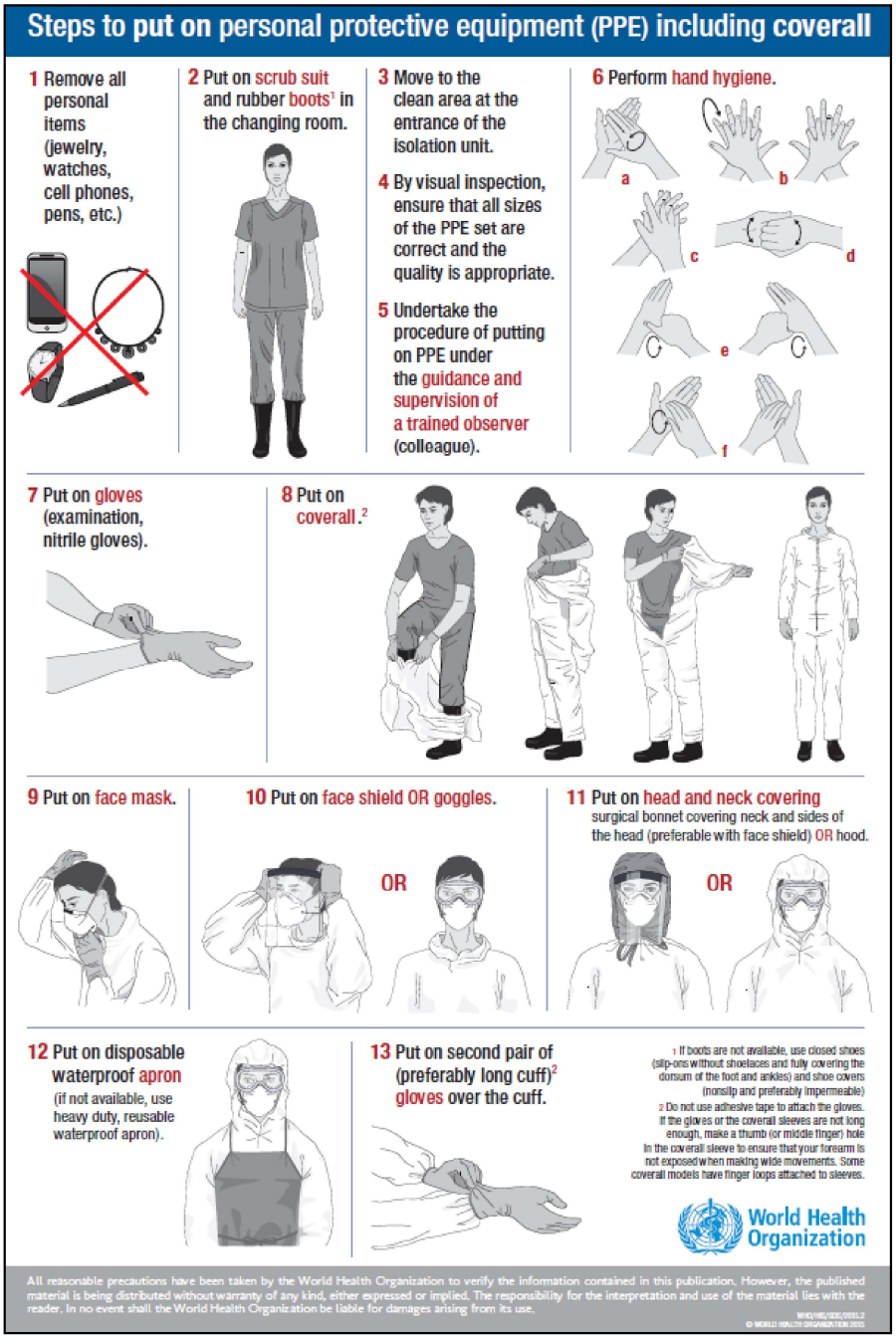
NB:

- 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.
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 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).

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

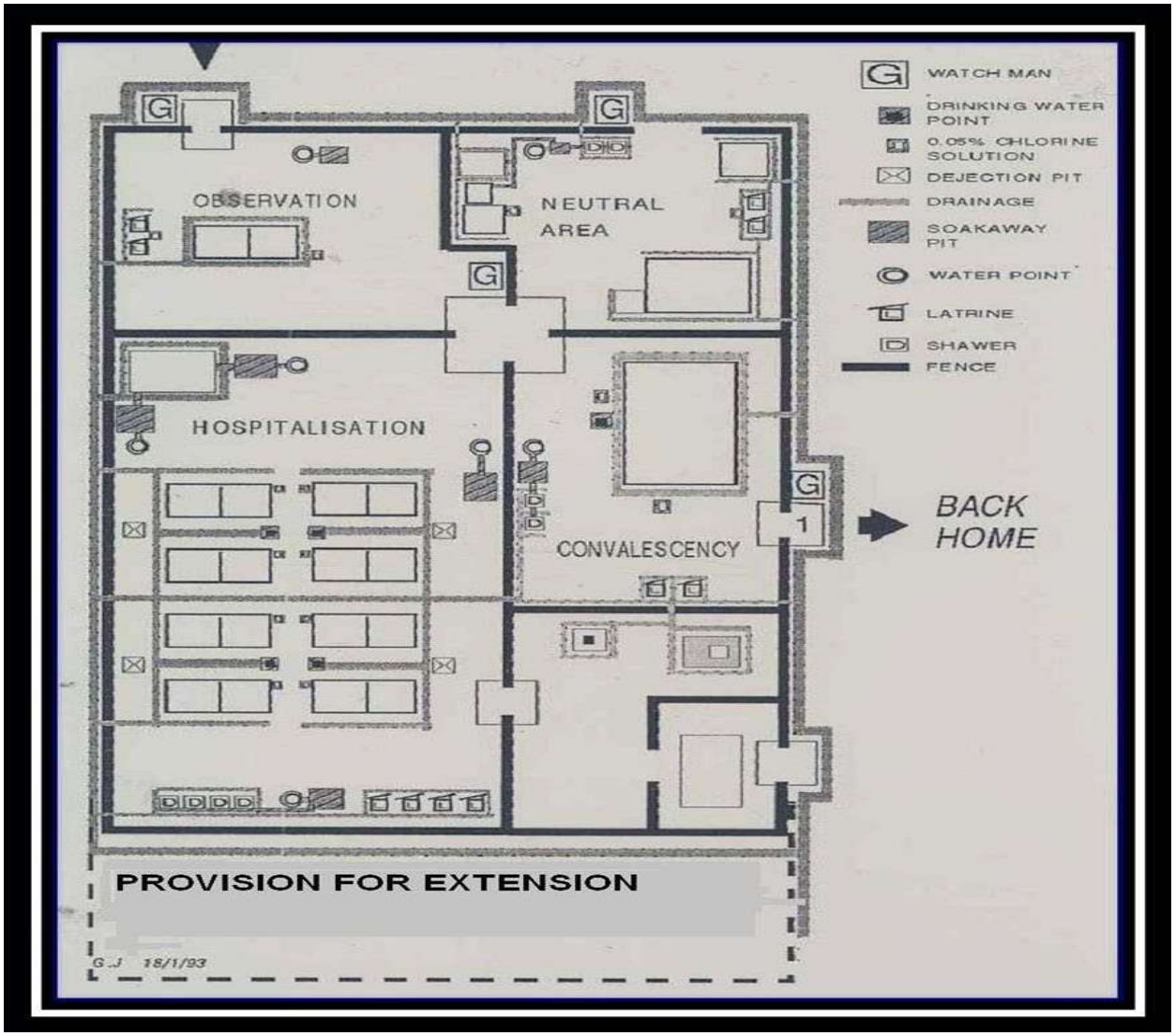
- In setting up a cholera camp, you can use an existing building or set up tents.
- It is important to consider the safety of patients and ventilation as high temperatures contributes to dehydration of the patients.
- The cholera camp should operate 24 hours a day independently of the other health facilities 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

(a) Patients are examined by a medical person for screening. If cholera, admit; otherwise send to normal dispensary.

(b) Patients are admitted with 1 attendant (caregiver) if necessary.

(c) Patients who are admitted are registered in the cholera line list.

(d) A foot bath should be provided at the entrance.

(e) Toilets and water should be easily accessible for patients.

(f) Shower facilities should be provided for the patients.

(g) 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
Asyphxiant/Blood Arsine	Cyanogen chloride Hydrogen cyanide	Possible cherry red skin Possible cyanosis	Possible frostbite Confusion Nausea Patient may gasp for air similar to asphyxiation but more abrupt onset Seizure prior to death
Choking/Pulmonary damaging	Chlorine Hydrogen chloride Nitrogen oxide Phosgene	Chlorine is a greenish yellow 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
Incapacting/behavior-altering	Agent 15/BZ	May appear as mass drug intoxication with ecastic behavior, distinct hallucinations and confusion Hyperthermia Mydriasis (dilated pupils)	May cause death Dry mouth and skin Initial tachycardia Altered consciousness, delusions, denial of illness, belligerence Hyperthermia Ataxia (lack of coordination) Hallucinations Mydriasis (dilated pupils)

Decontamination and treatment

Agent Type	Decontamination	First Aid Access ABCs	Other patient consideration
Nerve	Remove clothing immediately. Gently wash skin with soap and water Do not abrade skin For eyes, flush with plenty of water or normal saline	Atropine before other measures Pralidoxime (2PAM) chloride	Onset of symptoms from dermal contact with liquid forms may be delayed Repeated antidote administration may be necessary
Asyphxiant/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 oxine causes immediate pain
Incapacting/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 (physostigime) 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:).12-0.33ml/kg, not to exceed 10ml of 3% solution. Slow IV no less than 5 minutes, or slower of hypotenison develops Sodium thiosulfate: 1.65ml/kg of 25% solution IV over 10-20 minutes	For sodimu nitrite-induced orthosatic hypotension, normal saline infusion and supine position are recommended If still apnoeic after antidote administartauon, consider sodium bicarbonate for severe acidosis
Adult	Antidote may not be necessary	Sodium nititie: 10-20ml of 3% solution slow IV over no less than 5 minutes, or slower if hypotension develops and Sodum thiosulfate: 50ml of 25% solution IV over 10-20 minutes	

Note:

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

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