



GLOBAL TASK FORCE ON
CHOLERA CONTROL



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CHOLERA OUTBREAK RESPONSE
FIELD MANUAL

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Contents

Introduction	i
Cholera	ii
Abbreviations and acronyms	iii
Section 1. Outbreak detection and investigation	1
Section 2. Outbreak confirmation	7
Section 3. Organization of the response	13
Section 4. Monitoring the outbreak	23
Section 5. Risk communication and community engagement	33
Section 6. Cholera treatment facilities	37
Section 7. Case management in treatment facilities	49
Section 8. Reducing the spread of cholera in the community	63
Section 9. Oral cholera vaccine	73
Section 10. Preparedness and long-term actions	77

Appendices

Appendix 1. Definitions	89
Appendix 2. Field investigation and initial response checklist	91
Appendix 3. District-level supply forecasting tool	97
Appendix 4. Matrix for coordination of cholera control activities	99
Appendix 5. Template of a cholera line list	101
Appendix 6. Weekly community-based surveillance form	103
Appendix 7. Outline of the outbreak situation report	105
Appendix 8. Key messages for health education	109
Appendix 9. Chlorine solutions according to use	113
Appendix 10. CTU/CTC evaluation form	115
Appendix 11. Flow chart for cholera case management	117
Appendix 12. Admission and triage form	118
Appendix 13. Methods for household water treatment	120
Appendix 14. Preparation and use of 1% chlorine solution to disinfect water	123
Appendix 15. Rules for safe preparation of food to prevent cholera	127

Introduction

The response to a cholera outbreak must focus on limiting mortality and reducing the spread of the disease. It should be comprehensive and multisectoral, including epidemiology, case management, water, sanitation and hygiene, logistics, community engagement and risk communication. All efforts must be well coordinated to ensure a rapid and effective response across sectors.

This document provides a framework for detecting and monitoring cholera outbreaks and organizing the response. It also includes a short section linking outbreak response to both preparedness and long-term prevention activities.

Objectives

The content of this document is based on recommendations and guidance from the World Health Organization (WHO) and the Global Task Force on Cholera Control (GTFCC). The objectives are to:

- provide a comprehensive overview of cholera outbreak response;
- improve prevention, preparedness and timely response to cholera outbreaks.

Target audience

This document is intended primarily for public health professionals and programme managers who are directly involved in cholera outbreak detection and response. These include, for example, staff working at ministries of health, public health institutions, United Nations agencies including WHO country offices, and partners including non-governmental organizations.

When can the document be used?

This document can be used

- before an outbreak for prevention and preparedness
- when a cholera outbreak is suspected
- during an outbreak to organize and monitor the response
- after an outbreak to assess the response and improve prevention and preparedness

Structure of the document

This document contains an introduction to cholera, 10 technical sections and 15 appendices covering the key information, tools and action points. At the beginning of each section, a quick-reference box provides the contents of the section and a list of additional resources.

Cholera

Cholera is an acute diarrhoeal disease caused by infection of the intestine with the bacterium *Vibrio cholerae*, either type O1 or type O139. Both children and adults can be infected.

About 20% of those who are infected with *V. cholerae* develop acute watery diarrhoea; approximately 20% of these individuals develop severe watery diarrhoea, many also with vomiting. If these patients are not promptly and adequately treated, the loss of fluid and salts can lead to severe dehydration and death within hours. The case fatality rate in untreated cases may be 30–50%. However, treatment is straightforward (rehydration) and, if provided rapidly and appropriately, the case fatality rate should remain below 1%.

Cholera is transmitted by ingestion of faecally contaminated water or food and remains an ever-present risk in many countries. New outbreaks can occur in any part of the world where water supply, sanitation, food safety and hygiene are inadequate. The risk of cholera is considerably increased in humanitarian emergencies, when there are significant population movements and crowding in sites where displaced persons gather and frequent disruption of, or inadequate, access to healthcare services, clean water, sanitation and hygiene. Because the incubation period of cholera is short (2 hours to 5 days), the number of cases can rise quickly and many deaths can occur, creating an acute public health problem.

Spread of the disease within an area can be reduced through early detection and confirmation of cases, followed by an appropriate, well-coordinated multisectoral response. A strong multisectoral cholera preparedness plan that is well implemented will contribute to a more effective outbreak response.

In the long term, improvements in water supply, sanitation, food safety and community awareness of preventive measures are the best means of preventing cholera and other diarrhoeal diseases. In addition, WHO recommends that oral cholera vaccine use should be systematically considered as one of the measures to contribute to controlling cholera during outbreaks, in endemic areas and in humanitarian crises where there is a high risk of cholera.

Abbreviations and acronyms

ABHR	Alcohol-based hand rubs
AWD	Acute watery diarrhoea
AR	Attack rate
CFR	Case fatality rate
CHW	Community health worker
CTC	Cholera treatment centre
CTU	Cholera treatment unit
FRC	Free residual chlorine
GIS	Geographic information system
GPS	Global positioning system
GTFCC	Global Task Force on Cholera Control
IDP	Internally displaced person
IDSR	Integrated disease surveillance and response
IEC	Information, education and communication
IPC	Infection prevention and control
IR	Incidence rate
IV	Intravenous
KAP	Knowledge, attitudes, and practices
NCP	National cholera control and elimination plan
NGO	Non-governmental organization
OCV	Oral cholera vaccine
ORP	Oral rehydration point
ORS	Oral rehydration solution

PCR	Polymerase chain reaction
RDT	Rapid diagnostic test
SAM	Severe acute malnutrition
UN	United Nations
UNICEF	United Nations Children's Fund
WaSH	Water, sanitation and hygiene
WHO	World Health Organization

Section 1. Outbreak detection and investigation

Contents

Early detection of cases	1
Definitions	2
Use of cholera rapid diagnostic tests	3
Investigation of the alert, risk and needs assessments, and initial response	3
Risk assessment	4
Needs assessment	5

Additional resources

Appendix 1. Definitions	89
Appendix 2. Field investigation and initial response checklist	91
Appendix 3. District level supply forecasting tool	97

Early detection of cases

- Suspected cholera cases can be reported to health authorities from a variety of data sources including health centres or posts, hospitals, laboratories, community health workers, and other non-health sources such as teachers, religious leaders and local leaders. Informal sources such as the media and rumours may also be sources of information. All sources should be systematically tracked and further investigated to determine whether reports of suspected cases or outbreaks are accurate.
- Whatever the source of the information, when suspected cholera cases are detected or reported in a previously unaffected area, a cholera alert should be triggered, and immediate field investigation should be conducted to verify the alert and confirm the outbreak.
- Community-based active surveillance can be initiated or strengthened in at-risk areas with known seasonal upsurges and recurrent outbreaks before the expected season arrives to detect the first cholera cases as early as possible.

Definitions

Acute watery diarrhoea

Acute watery diarrhoea is an illness characterized by three or more loose or watery (non-bloody) stools within a 24-hour period.

Suspected cholera case

- In areas where a cholera outbreak has not yet been declared, any person aged 2 years or older presenting with acute watery diarrhoea and severe dehydration or dying from acute watery diarrhoea.
- In areas where a cholera outbreak has been declared, any person presenting with or dying from acute watery diarrhoea.

Note: *Children under 2 years of age can be affected by cholera and need to be treated immediately. When a cholera outbreak has been declared, children under 2 years of age who meet the cholera case definition should be recorded in the register, reported to the surveillance unit and considered in the epidemiological analysis.*

Cholera alert

A cholera alert (suspected cholera outbreak) is defined by the detection of at least one of the following:

- a) two or more people aged 2 years or older with acute watery diarrhoea and severe dehydration, or dying from acute watery diarrhoea, from the same area, within 1 week of one another;
- b) one death from severe acute watery diarrhoea in a person aged 5 years or older; and/or
- c) one case of acute watery diarrhoea testing positive for cholera by rapid diagnostic test (RDT) in an area that has not yet detected a confirmed case of cholera (including areas at risk for extension from a current outbreak).

Health facilities and community health workers should immediately report any cholera alert to the next level. The district health authorities shall

then initiate a field investigation to confirm the cholera outbreak and implement control measures see section 2 – outbreak confirmation.

For additional definitions, see appendix 1 – Definitions.

Use of cholera rapid diagnostic tests (RDTs)

- RDTs do not replace stool culture or polymerase chain reaction (PCR) to confirm cholera.
- A cholera outbreak can only be confirmed when specimens from suspected cases test positive by culture or PCR at the reference laboratory.
- RDTs are intended to be used at peripheral healthcare levels only for early outbreak detection—as a tool for initial alert—and not for individual diagnosis.
- Clinical management of patients is guided by their degree of dehydration, regardless of RDT result.
- The use of RDTs in outbreak detection is limited to improving the reliability and timeliness of cholera alerts.
- RDTs also permit the triage of specimens to be tested at the laboratory. Samples testing positive on a RDT should be prioritized for laboratory testing.

Investigation of the alert, risk, needs assessments, and initial response

- Send a multidisciplinary team to the field to investigate every cholera alert to confirm or rule out the outbreak, assess the risk of spread, identify priority actions, conduct an initial needs assessment and implement initial control measures (see appendix 2 – field investigation and initial response checklist).
- It is important to deploy a multidisciplinary team quickly, preferably within 24 hours.
- Ideally teams should include a clinical specialist with experience in case management of cholera patients, an epidemiologist, a water and

sanitation expert, an infection prevention and control expert, an expert in social mobilization, community engagement and risk communication and a laboratory technician for stool collection from suspected cases and to support and train local laboratory staff.

- Whatever the composition of the team, members should be aware of the procedures to confirm or rule out the outbreak and the elements to investigate, and should adopt a multidisciplinary approach.
- The team should work quickly and report findings, including risks and assessed needs, to decision makers as quickly as possible in order to provide a rapid and focused response.
- Teams should carry enough supplies to collect and transport stool samples, supplies to treat any patients present on site, ensure basic infection prevention and control (IPC) measures in the treatment centre and conduct community water, sanitation and hygiene (WaSH) investigations. Guidelines, protocols and information, education and communication (IEC) materials should also be taken and left in the field.

Risk assessment

- Assess the risk of spread, magnitude and potential impact of the outbreak.
 - Likelihood of transmission is based on factors such as access to safe water and improved sanitation; population behaviour (including water sources used, chlorination, open defecation, handwashing); geographical, environmental and climate conditions (expected cholera season, expected weather patterns, flooding, drought); areas with high population density (slums, camps for refugees or internally displaced persons [IDPs]), and areas with high transit of people or an influx of travellers.
 - Potential impact of the disease is based on factors including existing cholera preparedness, access to treatment (oral rehydration solution [ORS] and intravenous [IV] fluids), capacity of healthcare workers to provide case management, supplies available, health-seeking behaviour, malnutrition status and population immunity, as determined by previous exposure to cholera or previous cholera vaccination.

Needs assessment

- Identify the available resources (human and supplies) and estimate the needs based on the risk assessment.
- Communicate these estimates quickly to local and national authorities so the necessary resources can be rapidly procured and/or provided by the government or partners.
- Calculate the supplies needed based on the expected attack rates (ARs) and the population (see appendix 3 – district-level supply forecasting tool).
 - In rural communities with low population density, the ARs might vary (0.1–2%).
 - In crowded places (such as urban settings and camps for internally displaced persons and refugees), the ARs tend to be higher (1–5%).

The above actions can be taken before an outbreak is confirmed or declared.

Additional resources

1. **Interim Guidance Document on Cholera Surveillance.** Global Task Force on Cholera Control-Surveillance Working Group. June 2017. https://www.who.int/cholera/task_force/GTFCC-Guidance-cholera-surveillance.pdf?ua=1
2. **Interim Technical Note. The Use of Cholera Rapid Diagnostic Tests.** Global Task Force on Cholera Control-Surveillance Working Group. November 2016. https://www.who.int/cholera/task_force/Interim-guidance-cholera-RDT.pdf?ua=1
3. **Technical Guidelines for Integrated Disease Surveillance and Response in the African Region. Second Edition.** 2010. <https://www.afro.who.int/publications/technical-guidelines-integrated-disease-surveillance-and-response-african-region>

4. Early detection, assessment and response to acute public health events.
World Health Organization. 2014.
https://www.who.int/ihr/publications/WHO_HSE_GCR_LYO_2014.4/en/

Section 2. Outbreak confirmation

Contents

Definitions	7
Laboratory confirmation	8
Number of samples required	8
Collection, storage and transport of samples for confirmation by culture and PCR	9
Reporting of laboratory results	12
Additional resources	
Appendix 1. Definitions	89

Definitions

Confirmed cholera case

- A suspected case with *V. cholerae* O1 or O139 confirmed by culture or PCR.

For countries with the necessary diagnostic capacity and where cholera was never known to be present, or has been eliminated, the *V. cholerae* O1 or O139 strain is demonstrated to be toxigenic.

Cholera outbreak

- A cholera outbreak is defined by the occurrence of at least one confirmed case of cholera and evidence of local transmission.

In areas with sustained (year-round) transmission, cholera outbreaks are defined as an unexpected increase (in magnitude or timing) of suspected cases, over 2 consecutive weeks, of which some are laboratory confirmed. Such increases should be investigated and responded to appropriately through additional outbreak response and control measures.

For additional definitions, see appendix 1 – Definitions.

Laboratory confirmation

- When a cholera outbreak is suspected and an alert is triggered, collect stool samples from symptomatic individuals and send them to the reference laboratory for microbiological confirmation by culture and/or PCR and antimicrobial susceptibility testing.
- Currently available RDTs do not replace stool culture or PCR to confirm cholera (specificity is low and therefore false positives can occur); however, if RDTs are available at the health facility, prioritize samples from patients who tested RDT-positive for laboratory confirmation.
- RDTs are used as a tool for early outbreak detection only—for triggering a cholera alert—but not to confirm the cholera outbreak. Once the outbreak is declared, RDTs can be used for triaging the samples to be sent to the laboratory.
- For each new geographical area (district, province or region) affected by the outbreak, conduct laboratory confirmation of suspected cholera by culture or PCR.

Number of samples required

- Laboratory confirmation by culture or PCR of the first suspected cases is essential to confirm a cholera outbreak.
- Collect stool specimens from the first suspected cases (5–10 cases) and send them to the laboratory for confirmation.
- Declare the outbreak if *V. cholerae* O1 or O139 is confirmed by culture or PCR with evidence of locally-acquired infection (exclude imported cases). The government can declare the outbreak with advice of the international agencies, local authorities and non-governmental organizations (NGOs).
- Once the outbreak is declared, there is no need to confirm all suspected cases. The clinical case definition is sufficient to monitor epidemiologic trends.
- Determine antimicrobial susceptibility patterns for the first isolates confirmed by the laboratory at the beginning of the outbreak to provide sufficient information to guide antimicrobial treatment.

- Thereafter, carry out periodic sampling from each affected area for confirmation and antimicrobial susceptibility testing (see section 4 – monitoring the outbreak).
 - If RDTs are available, prioritize RDT-positive samples.
- Remember that clinical management of cases is guided by the degree of dehydration of the patient; clinical management does not require RDT testing or laboratory confirmation.

Collection, storage and transport of samples for confirmation by culture and PCR

- Accurate and reliable test results depend on having a sample that has been collected, stored, and transported correctly.
- Collect faecal specimens (stool or rectal swabs) from suspected cases within the first 4 days of illness (when pathogens are usually present in highest numbers) and, if possible, before any antimicrobial therapy has been started.
- Do not delay rehydration of patients to take a specimen. Specimens may be collected after rehydration has begun.
- Collect the stool samples and preserve the sample in Cary-Blair transport medium. Cary-Blair transport medium has a shelf life of up to 1 year from date of manufacture and does not require refrigeration (neither before use nor once inoculated). The medium can be used as long as it does not appear dried out, contaminated or discoloured.
- Follow the following steps to preserve samples in Cary-Blair transport medium.
 1. Collect stool samples or rectal swabs.
 - a) For collection of stool samples:
 - Collect a small amount of stool by inserting a sterile cotton or polyester-tipped swab into the sample and rotating it.
 - Withdraw the swab and examine it to make sure that it carries some visible faecal material.

b) For collection of rectal swabs:

- Moisten the swab in sterile Cary-Blair transport medium.
 - Insert the swab 2–3 cm beyond the rectal sphincter and rotate.
2. Immediately place the swab in the transport medium, pushing it to the bottom of the tube.
 3. Break off and discard the top portion of the stick that extends beyond the tube.
 4. Record the patient's name or initials, specimen number, type of sample, and date of collection on the outside of the Cary-Blair tube.
 5. Send the sample to reach the laboratory within 7 days after taking the sample; it is not necessary to refrigerate the sample.
 - If Cary-Blair transport medium is not available:
 - Collect a fresh stool sample that has not been in contact with chlorine or other disinfecting agent. Place the specimen in a clean container (with no chlorine or any disinfecting agent residue) with a tight-fitting, leakproof lid.
 - Transport to the laboratory within 2 hours at room temperature.
 - If Cary-Blair transport medium is not available and the specimen will not reach the laboratory within 2 hours, use filter paper to preserve and transport the samples as follows.
 - a) For culture: use wet filter paper.
 - Culture can be performed from liquid stool samples on filter paper and kept in a moist environment.
 - Using tweezers, dip a small filter paper disc into a fresh stool sample that has not been in contact with chlorine or other disinfecting agent.
 - Put the sample in a screw-cap microtube and add two or three drops of normal saline solution to stop the sample from drying out. Close the tube well and store at room temperature.

- b) For PCR: use dry filter paper.
- Dry filter paper can be used for transport of faecal specimens for specific DNA detection by PCR.
 - Place a drop of liquid stool on dry filter paper and allow it to air dry.
 - Once dry, use tweezers to place the filter paper in a screw-cap micro tube and store at room temperature. Do not add normal saline to the microtube.
- All specimens should be sent to the laboratory, addressed to the cholera focal person, accompanied by a laboratory request form containing, at minimum, the following information: healthcare centre, cholera treatment unit or centre (CTU/CTC) or hospital, patient name or initials, age, place of residence, date and time of collection, symptoms (or treatment plan), RDT results (if performed) and type of testing requested (culture and/or PCR for cholera).
 - For all samples:
 - Maintain specimens at ambient temperature at all times. Do not refrigerate specimens, as refrigeration can greatly decrease the population of *V. cholerae*.
 - Do not allow specimens to dry (unless sending on dry filter paper for PCR). Add additional drops of normal saline solution if necessary.
 - Transport in a well-marked, leakproof container at ambient temperature.
 - Ensure that each specimen and container is properly identified and accompanied by a laboratory request form.
 - Prior to sending, ensure that the accepting laboratory has the knowledge and capacity to treat the type of sample (for example, wet filter paper for culture, dry filter paper for PCR).

Reporting of laboratory results

- Laboratories should maintain an updated database with all samples received and tested and the results of testing.
- Laboratories should send results immediately after completion of testing to:
 - the health facility where the patient was admitted, with identifying information where available so the results can be added to the register and clinic records; and
 - the surveillance unit at the respective health authorities (district, provincial and national level) to update the epidemiological information and the situation report.
- Report results of antimicrobial susceptibility testing immediately to the Ministry of Health Clinical Care Services and the health facility to assure appropriate antimicrobial treatment.

Additional resources

1. Interim Guidance Document on Cholera Surveillance. Global Task Force on Cholera Control-Surveillance Working Group. June 2017.
https://www.who.int/cholera/task_force/GTFCC-Guidance-cholera-surveillance.pdf?ua=1
2. Interim Technical Note. The Use of Cholera Rapid Diagnostic Tests. Global Task Force on Cholera Control-Surveillance Working Group. November 2016.
https://www.who.int/cholera/task_force/Interim-guidance-cholera-RDT.pdf?ua=1
3. Technical Guidelines for Integrated Disease Surveillance and Response in the African Region. Second Edition. 2010.
<https://www.afro.who.int/publications/technical-guidelines-integrated-disease-surveillance-and-response-african-region>

Section 3. Organization of the response

Contents

Sectors to include in a multisectoral response	13
First steps to control a cholera outbreak	16

Additional resources

Appendix 3. District-level forecasting supply tool	97
Appendix 4. Matrix for coordination of cholera control activities	99

Sectors to include in a multisectoral response

Coordination

- Activate or establish a cholera coordination committee or task force that meets regularly to coordinate the response, identify challenges and mobilize resources to address those challenges. This committee is composed of relevant government institutions, agencies and local authorities, and national and international partners and NGOs.
- Based on the extent of the outbreak, this committee can be activated at national and/or subnational levels.
- This committee receives timely information and publishes and distributes daily updates and weekly situation reports that cover indicators on surveillance and epidemiology, WaSH, social mobilization, logistics and case management.
- This committee should estimate overall needs, orient and coordinate action and ensure that human resources and supplies for case management, WaSH, social mobilization and IEC materials are available when and where needed.

Epidemiology

- Standard line lists or registers should be available and used in all treatment centres.
- Compile data daily from the treatment centres and describe the outbreak in terms of who is affected, where the outbreak is located and its evolution to guide control measures. Share reports with the cholera coordination committee and with relevant sectors (such as WaSH, case management, social mobilization) to target actions.
- Collect information on suspected cholera cases and deaths from the community (for example, interview community health workers, families of patients and village leaders; visit the burial area to verify the number of fresh graves).
- Conduct field investigations in the affected areas to identify patients in the community (active case finding), explore possible sources of contamination, and identify risk factors and transmission pathways.
- If possible, collect geographic information system (GIS) points and create maps of patients' households and water sources to help identify high-risk areas. Collection of geolocalization data may be done by teams visiting patients' homes to carry out prevention activities. Share this data frequently with WaSH, social mobilization and case management teams in order to orient activities.

WaSH

- Assess the current conditions and identify risks for transmission in the community, including access to safe water and sanitation, environmental hygiene and key risk behaviours.
- Intervene with prompt WaSH measures; assure drinking water sources are adequately chlorinated at point of use at 0.5 mg/L of free residual chlorine (FRC). These measures can be prioritized in any high-transmission areas identified during the risk assessment.
- Water quality monitoring data should be shared with the coordination committee.

- Interventions to ensure access to chlorinated drinking water may include support to municipal systems or household water treatment.
- At household level, provide soap and water treatment products. Deliver WaSH messages to prevent cholera. This action is often oriented to the household and neighbours of patients admitted to cholera treatment structures, and should be coordinated with hygiene promotion colleagues.
- Visit the homes of cholera patients (when there are few and resources permit) and the affected communities to conduct active case finding, gather information and provide health education, water treatment products, soap and ORS.
- Work closely with case management and logistics colleagues to ensure adequate IPC in treatment structures.

Case management

- Immediately set up oral rehydration points (ORPs) and cholera treatment facilities (CTUs/CTCs). Ensure staff are trained on treatment protocols, adequate supplies are available and job aids are in place.
- Ensure that ORPs and CTUs/CTCs are accessible to the most-affected populations.
- Work closely with epidemiology and logistics to predict supply needs and pre-position them as needed.
- Train health-care workers on the use of RDTs, specimen collection and transport procedures.
- Work closely with WaSH and logistics colleagues to ensure adequate IPC measures in treatment structures.

Oral cholera vaccination

- Consider vaccination with oral cholera vaccine (OCV) to contain ongoing outbreaks (if implemented early) and to limit the spread of the outbreak into new areas.

- OCV can also be used to prevent outbreak occurrence in settings with high risk of cholera (such as refugee camps and slums) and to reduce disease transmission and the incidence of the disease in endemic areas or hotspots.
- Clearly define the geographical areas and population to be targeted by vaccination based on the epidemiological situation, risk factors and the current local infrastructure and capacities.
- OCV should be used in conjunction with other cholera prevention and control strategies.

Social mobilization and community engagement

- Investigate hygiene and sanitation infrastructure available in the area, including access to and use of these services. Identify at-risk populations and prioritize areas for rapid intervention.
- Engage the community to transmit health promotion and cholera prevention messages and to promote early treatment for diarrhoea.
- Messages should focus on recognizing symptoms of cholera and how it is transmitted, encouraging early treatment-seeking behaviour and increasing awareness of prevention practices and strategies.
- Focus messaging over time to address main risks and gaps (identified through field investigations and case-control or knowledge, attitudes and practices [KAP] studies), with positive actions that can be taken (such as increasing household water chlorination, bringing sick people to the clinic immediately, improving handwashing and preparing food safely).

First steps to control a cholera outbreak

1. Activate the cholera coordination committee

- Create a multidisciplinary cholera coordination committee for coordination between relevant sectors (such as WaSH, education, communication, hygiene promotion) with representatives from relevant ministries and local authorities, international agencies, NGOs, and others as appropriate.

- Clearly establish the lead organization or institution of the committee. It is usually led by the Ministry of Health in the country.
- During large outbreaks, there may be a national committee and subcommittees to treat more technical subjects (such as surveillance, laboratory, WaSH, case management, logistics, social mobilization). Not all members in a technical group will attend the national committee meetings, but at least one representative from each group should attend to ensure communication exchange and coordination across sectors.
- If a cluster approach is activated, facilitate the participation of all relevant partners. Roles and responsibilities of the different coordination bodies must be clearly defined.
- Assess the need for subnational coordination structures. Depending on the extent and magnitude of the outbreak, the size of the country and its health service structure, similar committees may be created at subnational or more peripheral levels.
- The cholera coordination committee should meet frequently during the outbreak period (at least once or twice a week, and even daily in the initial phases) and should be action-oriented based on the context and progress of the outbreak.
- The committee should try to coordinate fundraising for the emergency response.

Functions of the cholera coordination committee

This committee provides strategic direction, including the rapid and efficient development, execution and monitoring of the outbreak response plan, as well as implementation and monitoring of activities. Main functions include the following:

- Estimate the potential amplitude of the outbreak and the expected number of cases based on risk assessment and available epidemiological data. Identify priority areas for all interventions.
- Identify human resources and supplies available and needed (see appendix 3 – district-level supply forecasting tool). List unfulfilled needs with required external support.

- Establish cholera treatment facilities in the affected areas to ensure prompt access to treatment. The committee can identify a partner or institution with sufficient capacity to do this or to provide additional support as necessary.
- Provide health-care professionals with approved case management protocols. If these are not available, a subcommittee may be created to develop them.
- Procure and distribute necessary supplies in a timely manner to avoid any shortages.
- Coordinate all partners involved in the response to avoid duplication and overlaps, and to maximize overall response efficiency and effectiveness (see appendix 4 – matrix for coordination of cholera control activities).
- Develop or update a multisectoral cholera response plan as rapidly as possible.
- Create and distribute regular situation reports (at least weekly) on surveillance and epidemiology, laboratory, WaSH, case management, and social mobilization. Include needs identified, implemented measures and recommended actions. Share with donors, government and the public.
- Organize regular briefings and meetings and provide regular, concise and updated information on the epidemiological situation and on the effectiveness of the outbreak response, including:
 - description and monitoring of the outbreak: magnitude, evolution over time (epidemiological graphs to show improvement or deterioration of the situation), geographical extent including maps, other significant features (elements such as AR, case fatality rate [CFR], and other relevant information such as displaced populations or difficult to-reach populations and rainfall or flooding);
 - regularly updated needs for resources, including personnel and supplies; and
 - control activities undertaken and planned.

- Organize relevant trainings in surveillance, case management, laboratory sampling, chlorine solution preparation, IPC measures and other topics as needed.
- Produce or update IEC materials adapted to the context for health education. Ensure best practices for effective risk communication and use adequate dissemination means (such as radio, posters, TV and local leaders).
- Mobilize, train, and equip community focal points (for example, community health workers, local leaders, village chiefs, heads of household) for health promotion messaging, rapid case detection, dehydration management at home with ORS and treatment-seeking behaviour.
- Arrange provision and ensure access to sufficient quantities of safe water and sanitation in all affected areas.
- Assess potential use of OCVs and, if necessary, support the Ministry of Health in preparing and submitting the request to the global stockpile. Conduct microplanning and implement and coordinate OCV campaigns (see section 9 – oral cholera vaccines).
- Supervise, monitor and evaluate control activities and interventions implemented.

2. Develop a cholera response plan and a preparedness for areas at risk

- Develop an integrated and multisectoral cholera response plan based on risk and needs assessments.
- Objectives:
 - a) reduce the mortality due to cholera.
 - b) reduce transmission of the disease in affected areas.
 - c) prevent and/or minimize the risk of introduction of the outbreak to other high-risk areas.

- The cholera response plan should include sections on coordination, early warning and surveillance, case management and IPC measures, WaSH, OCV, risk communication and community engagement, essential supplies and logistics, measures to prevent spread into neighbouring areas and countries, and budget.
- Each section should have clear activities and indicators for monitoring and evaluation.
- Integrate and strengthen prevention activities, mainly WaSH, social mobilization and surveillance in areas that are unaffected but at high risk.

3. Implement control measures

- Control measures should be implemented rapidly, as soon as there is an indication of a cholera outbreak. Control measures focus on reducing mortality and limiting the spread of the disease. See sections 6, 7 and 8.
- **Key actions to reduce mortality include:**
 - Set up decentralized cholera treatment facilities (CTUs/CTCs) and oral rehydration points (ORPs) for rapid access to treatment.
 - Distribute ORS in the community and to households. Explain how to prepare and administer the ORS.
 - Employ early detection, triage and transfer of severe cases for IV fluid treatment.
 - Train health professionals using standard case management protocols and IPC measures.
 - Distribute validated treatment protocols to health facilities and CTUs/CTCs.
 - Estimate supplies; procure and distribute needed supplies to avoid any shortage.
 - Inform the public about what people should do if someone is ill with diarrhoea; include instructions about rehydration with ORS at home or on the way to a treatment facility and how and where to seek immediate treatment.

- **Key actions to reduce the spread of the disease:**

- Identify possible sources of contamination and main transmission routes to target interventions.
- Provide safe water in sufficient quantity and improve sanitation and safe excreta disposal and management.
- Monitor water sources regularly for free chlorine levels and report findings to coordination committee; emphasize gaps in chlorination.
- Identify gaps and promote hygienic conditions and practices (such as handwashing, household water treatment and storage, safe preparation of food, safe burials) and report findings to the coordination committee for immediate action.
- Strengthen IPC measures and WaSH at CTUs/CTCs.
- Strengthen epidemiological and laboratory capacity for surveillance.
- Conduct epidemiological studies (such as KAP and case-control studies) to identify risks and gaps.
- Communicate often to the public through appropriate means (including press releases, TV, radio, social media) and strengthen community engagement.
- Conduct GIS mapping of cases, water sources and other features to identify regions of high disease burden or emerging areas of high transmission to target interventions.
- Include oral cholera vaccine (OCV) as part of the multisectoral interventions to control cholera.

4. Procure cholera kits

- Cholera kits help countries to prepare for a potential cholera outbreak and to support the initial response.
- The overall package consists of six different kits, each divided into several modules. The kits and modules can each be ordered separately.

- Three kits are designed for the treatment of cholera patients within existing structures at the central, peripheral and community levels.
 - One kit provides the necessary material to set up a provisional structure for patient care when no existing structure is in place.
 - Two kits list the equipment needed for the investigation of cholera outbreaks and for the laboratory confirmation of suspected cholera cases.
- Some items – especially in regards to water abstraction, treatment and distribution, safe excreta disposal and management, and IPC – may not be included in the cholera kits and will require local procurement.

Procurement

- United Nations (UN) agencies can order cholera kits via WHO or United Nations Children’s Fund (UNICEF) procurement.
- Non-UN entities should contact WHO Procurement Services at procurement@who.int. Put the words “Cholera kits” in the subject line of the email message. WHO Procurement Services will provide guidance for a direct procurement.

Additional resources

1. Cholera outbreak: assessing the outbreak response and improving preparedness. Global Task Force on Cholera Control. 2010
<https://www.who.int/cholera/publications/OutbreakAssessment/en/>
2. Technical Guidelines for Integrated Disease Surveillance and Response in the African Region. Second Edition. 2010.
<https://www.afro.who.int/publications/technical-guidelines-integrated-disease-surveillance-and-response-african-region>
3. Revised cholera kits and cholera kit calculation tool. World Health Organization. 2019
<https://www.who.int/cholera/kit/en/>

Section 4. Monitoring the outbreak

Contents

Epidemiological surveillance	23
Data collection	24
Data reporting	25
Data analysis	27
Laboratory surveillance	30
Environmental surveillance	32

Additional resources

Appendix 5. Template of cholera line list	101
Appendix 6. Weekly community-based surveillance form	103
Appendix 7. Outline of the outbreak situation report	105

Epidemiological surveillance

- Describe the outbreak (who is affected, where the outbreak is located and its evolution) to guide control measures.
- Monitor and evaluate the impact of the interventions implemented.
- Conduct field investigations in the affected areas including active case finding, explore possible sources of contamination and identify risk factors and transmission pathways. If possible, test sources of drinking water of patients for faecal contamination, or if the water is reported to be chlorinated, test for free residual chlorine (FRC).
- During the field investigations include an intervention component, such as distribution of water treatment products and ORS, and deliver key messages for health education. Interventions should be prioritized for the household and neighbours of individuals with cholera.
- Map the locations of homes and water sources where people have been found to have cholera to help identify areas at risk, target interventions and monitor disease spread.

- Implement prevention and control measures for suspected or potential risk exposures. If resources permit, a case-control or KAP study may help to identify these. Do not wait to implement prevention and control measures.

Data collection

- A standard line list should be available and used in all health facilities and the same data collected by all partners. Provide a template if necessary (see appendix 5 – template of a cholera line list).
- Depending on country capacity, registers can be paper-based or electronic-based forms.
- Case information includes: name, age, sex, place of residence (at lowest recognized administrative unit), date of visit, dehydration status and treatment plan, hospitalization, outcome, date of discharge or death, stool sample taken, RDT result and laboratory confirmation (culture and/or PCR) and vaccination status. Additional information on exposures, occupation, pregnancy, malnutrition status, global positioning system (GPS) points of the house of the patients, etc. can also be included in the register.
- Data should be compiled daily and reported to the local health authorities through the established channels. Patient records and registers must be kept from the start of the epidemic to its very end.
- Ensure that community health workers are trained and integrated in the surveillance system and that they systematically collect and report suspected cases and deaths occurring in the community, especially in remote areas. Implement community-based surveillance in areas where necessary.
- Community health workers should record and report to the health facility or district health office the number of cases and deaths occurring in the community where people did not seek medical attention and consequently are not registered at the health facilities (see appendix 6 – weekly register for community-based surveillance).

Data reporting

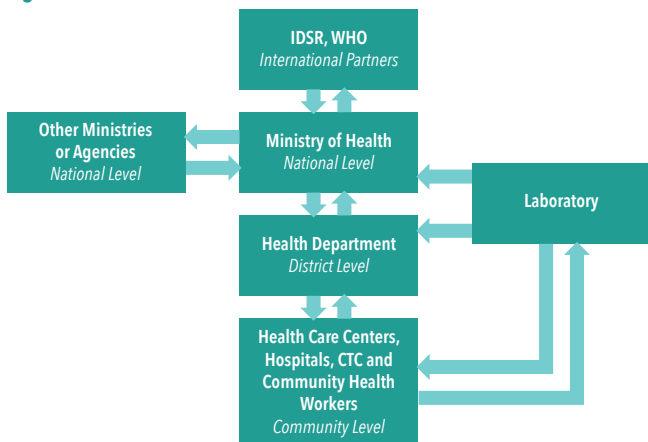
- Report the aggregated number of cholera cases and deaths – both registered at the health facility and occurring in the community – by age group (minimally under 5 years of age and 5 years of age or older) to the surveillance unit/health authorities' office (district, regional or national).
- The reporting procedures may include paper reporting forms, electronic methods or telephone.
- Aggregate data at each health administrative level before reporting to the next highest health authorities (figure 1).
- Ensure that partners (NGOs, international agencies, etc.) managing independent cholera structures also report to the local health authorities (at the district or national level).
- Compile, validate and analyse the data at each health administrative level to describe the outbreak, monitor trends and identify populations at risk, and guide preventive and control measures.
- Laboratories should also inform and update the surveillance unit about the number of positive cases and antimicrobial susceptibility patterns. This information should be shared as part of regular epidemiological updates.
- Ensure data exchange with other countries when there is a risk of cross-border transmission. High-risk districts often share borders with neighbouring countries.

Periodicity of reporting

- In a previously unaffected area or area with no recently reported cases, immediately report (within 24 hours) any cholera alert to the next level health authority (district, regional or national) to conduct field investigations and confirm or rule out the outbreak.
- Community health workers must immediately report any alert to the nearest health facility or district health authority.

- In an area where a cholera outbreak has been declared, report on a daily or weekly basis the number of cases and deaths – both registered at the health facility and occurring in the community – to monitor the outbreak and to guide and adapt control measures.
- In an area where cholera is common, with year-round cases, report at least weekly the number of cases and deaths – both registered at the health facility and occurring in the community – in order to estimate basic surveillance indicators (incidence rates, AR and CFR), assess the impact of the interventions and help plan control strategies.
- Laboratories should immediately report the results of testing in the suspected cases to the health authorities, and to the health facility sending the sample, especially in a previously unaffected area.
- Once an outbreak is declared, the laboratory should periodically report to the health authorities the number of samples received, the number of samples tested and the test results by date and reporting area.

Figure 1. Flow of information



Data analysis

- Health authorities should collect and analyse data received by all sources in a timely manner to describe the situation, identify populations at risk and initiate the necessary preventive and control measures. Incidence rates, CFR and AR are key epidemiological indicators.
- Health facilities should also conduct data analysis of the cases and deaths seen at the health facility.
- Produce regular (daily or weekly) epidemiological bulletins or situation reports to disseminate among partners at district and national levels (see appendix 7 - outline of the outbreak situation report).
- Include all sectors (health, WaSH, hygiene promotion, etc.) and partners (national authorities, national and international partners) in dissemination of outbreak information, to orient and adapt prevention and control activities. Partners should exchange information to guide actions.
- If available, consider historical data of previous outbreaks to better interpret the analysis.
- Consider conducting epidemiological studies (such as KAP and case-control studies) to identify risks factors and transmission patterns.

Descriptive epidemiology

By person

- Provide description of cases (suspected and confirmed) by age (under 5 years of age and 5 years of age or older) from community and health facilities to identify and describe the affected population. If population figures are available, the number of cases can be expressed as incidence rates (IRs) and attack rates (ARs).
- Include the number of hospitalized patients and proportion of cases by dehydration status or treatment plan applied.

- Provide the number of deaths (at the health facility and in the community) in a region or district over time. The risk of dying from cholera is usually expressed by case fatality rate (CFR), by dividing the number of deaths attributed to cholera by the total number cholera cases (suspected and confirmed).

By time

- Provide description of cases and deaths over time to monitor the evolution and magnitude of the epidemic; data are usually presented as a histogram epidemic curve, plotting the number of cases by date of visit or date of onset of symptoms.
- The risk of death from cholera is represented in the epidemic curve by the CFR for each time period (i.e. daily, weekly or monthly). This is usually shown as a line superimposed over the bar graph.

By place

- Provide geographic distribution of cases by place of residence (per village, district and region) to identify affected areas at higher risk and to monitor outbreak extension.
- If possible, collect GIS points and create maps of patients' households and water sources to help identify high-risk areas. The collection of this type of data can be conducted by WaSH/environmental teams, volunteers, community health workers and others who are conducting health promotion or following up on the distribution of hygiene kits at patients' homes.

Incidence Rate (IR)

- The IR shows the speed at which new cases occur within a given period of time (usually per week) in a given area or a specific population (such as an age group).
- IRs can be expressed per 100 (percentage), per 1000, per 10 000 persons, or even more in case of small numbers of cases.

- IRs indicates the evolution of the epidemic and the rapidity of its spread. It can be compared between groups and with other areas since incidence is adjusted by population.

$$IR = \frac{\text{number of cases in one week}}{\text{population}} \times 10\,000$$

Attack rate (AR)

- AR is the cumulative incidence of cholera over a defined period of time (usually the duration of an epidemic) in a defined area and population.
- AR is usually expressed as a percentage and can be calculated by age and area.
- AR indicates the impact of the epidemic in the population.
 - In rural communities with low population density, the AR might vary (0.1–2%)
 - In crowded places (such as urban settings, refugee camps), the AR tends to be higher (1–5%).
 - In settings with no immunity and poor water and sanitation conditions, AR can exceed 5%.

$$AR = \frac{\text{total number of cases reported since the beginning of the outbreak}}{\text{population}} \times 100$$

Case fatality rate (CFR)

- CFR is the proportion of cholera deaths among total number of cases within a specified period of time, expressed as a percentage.
- Deaths occurring at the CTUs/CTCs and in the community should be recorded and analysed separately. Calculate CFR at health facilities and in the community.
- CFR, calculated with deaths and cases registered in a given health structure, is an indicator of adequate case management and access to treatment. The death of a person from cholera at any time after arrival at a health facility is considered to be an institutional death.

- Cholera CFR can reach 50% if adequate treatment is not provided for patients with severe dehydration. With adequate and appropriate treatment, no one should die of cholera. However, a treatment centre with a CFR of less than 1% is considered to be well run.
- High CFR may indicate:
 - poor access to treatment – patients arrive late in the progression of the disease (with severe dehydration) due to factors including long distances from care centres with no means of transport; cultural barriers, beliefs or misinformation on when and where to go for treatment; or costs of care;
 - inadequate case management due to factors including lack of properly trained health professionals, lack of supplies and overwhelmed facilities; and/or bias of surveillance where deaths are more accurately recorded than numbers of cases (for example, outpatient cases are not recorded).
- If CFR is high, an assessment of the treatment structure, including early access to care, should be conducted to identify the causes and implement corrective measures (see section 6 – cholera treatment facilities).

$$\text{CFR} = \frac{\text{number of cholera deaths}}{\text{number of cholera cases}} \times 100$$

Laboratory surveillance

- Once an outbreak is declared, record and report any person presenting with suspected cholera.
 - Remember: In areas where a cholera outbreak has been declared, a suspected cholera case is defined as any person presenting with or dying from acute watery diarrhoea.
- There is no need to confirm all suspected cases in the laboratory.
- Conduct laboratory confirmation by culture or PCR of suspected cholera cases for each new area (district, province or region) affected by the outbreak (see section 2 – outbreak confirmation).

- Perform periodic sampling of suspected cases to monitor the outbreak, to determine the antimicrobial susceptibility profile and to carry out continuous monitoring of strains.
 - If RDT is available, send samples from patients with positive RDTs to the laboratory. Alternatively, send sample from patients with severe dehydration.
 - The number of samples collected and tested depends on the laboratory capacity and the extent and magnitude of the outbreak.
 - Ideally, submit a minimum of five samples (from patients randomly selected) per week per inpatient health facility.
 - On the confirmed isolates, perform antimicrobial susceptibility testing to guide antibiotic treatment, however, this is not required for individual cases. At least one isolate per week per affected area should be tested to monitor the antimicrobial susceptibility patterns.
 - Results of antimicrobial susceptibility should be reported to healthcare workers so they can adapt the antibiotic treatment accordingly (see section 7 – case management in treatment facilities).
- In a situation of large or nation-wide outbreak, select a representative number of health facilities or CTUs/CTCs (sentinel sites) for collection and shipment of samples for testing. Sentinel sites should be selected to represent the main affected areas.
- Contact international reference laboratories for external quality control and for shipment of specimens for further characterization, such as DNA-based molecular testing.

Environmental surveillance

Environmental sampling to detect outbreak strains of *V. cholerae* does not serve an immediate public health purpose, other than in unusual circumstances where cholera is rare or unknown and a single source seems likely. Water testing should focus on FRC levels and basic tests for faecal contamination. The benefits of environmental sampling, such as long-term monitoring and strain identification, are primarily of research interest or elimination monitoring and thus beyond the scope of this document.

Additional resources

1. Interim Guidance Document on Cholera Surveillance. Global Task Force on Cholera Control-Surveillance Working Group. June 2017.
https://www.who.int/cholera/task_force/GTFCC-Guidance-cholera-surveillance.pdf?ua=1
2. Technical Guidelines for Integrated Disease Surveillance and Response in the African Region. Second Edition. 2010.
<https://www.afro.who.int/publications/technical-guidelines-integrated-disease-surveillance-and-response-african-region>
3. Interim Technical Note Introduction of DNA-based identification and typing methods to public health practitioners for epidemiological investigation of cholera outbreaks. Global Task Force on Cholera Control. June 2017
https://www.who.int/cholera/task_force/GTFCC-Laboratory-support-public-health-surveillance.pdf?ua=1
4. Managing a cholera epidemic. Chapter 2. Outbreak investigation. MSF. August 2017.
<https://samumsf.org/sites/default/files/2018-10/Management%20of%20a%20Cholera%20Epidemic.pdf>
5. Cholera outbreak: assessing the outbreak response and improving preparedness. Global Task Force on Cholera Control. 2010
<https://www.who.int/cholera/publications/OutbreakAssessment/en/>

Section 5. Risk communication and community engagement

Contents

Risk communication	33
Clarifying rumours and community concerns	34
Media involvement in the outbreak response	34
Community engagement	35

Additional resources

Appendix 8. Key messages for health education	109
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Risk communication

- Communication with the public during a cholera outbreak is critical not only for the rapid control of the outbreak, but also to keep the public informed and reduce the risk of social, political and economic turbulence.
- Risk communication is defined as the real-time exchange of information, advice and opinions between experts or officials and people who face a threat to their survival, health or economic or social well-being.
- The purpose of risk communication is to ensure that everyone at risk for cholera is informed about how to reduce the risk of spreading the disease, take personal protective and preventive measures, and proceed if someone gets sick.
- Public health officials must report, fully and rapidly, what they know, what they suspect and what they are doing to control the outbreak.
- Best practices for effective risk communication include the following:
 - Create and maintain trust.
 - Acknowledge and communicate even in uncertainty.

- Be transparent and fast with the first communication and all communications.
- Be proactive in public communication, using a mix of preferred channels of affected populations, such as TV, radio, SMS, internet, social media, mass awareness initiatives, and social mobilization.
- Understand local knowledge and behaviours (including beliefs and barriers) towards cholera and adapt the messages accordingly.
- Involve and engage the community in the outbreak response through community leaders and influencers.

Clarifying rumours and community concerns

- Trusted information should reach people and rumours should be addressed by maintaining a very open flow of information from the beginning of the outbreak; rumours spread easily when information is incomplete or delayed.
- Define a strategy to disseminate accurate information promptly, rather than responding to rumours.
- Provide information that is easily understood, complete and free of misleading information.
- Key messages to the public should help people to recognize symptoms of cholera and how it is transmitted and provide information about what to do for prevention and treatment, encouraging early treatment-seeking behaviour.
- Information should include what cholera is, how it can be prevented, why, when and where to seek help, and how to care for family members with diarrhoea (see appendix 8 – key messages for health education).

Media involvement in the outbreak response

- Establish partnerships with the media to contribute to controlling the outbreak by providing:
 - information to people within and outside the affected area;

- information in the appropriate language;
- information through the appropriate channels (radio, press, TV);
- the right type of information, with the right frequency.
- When an outbreak starts, designate a single spokesperson who will be the focal point for the media.
- Plan regular press releases and conferences. Prepare a set of frequently asked questions (FAQ) with responses.
- Public health authorities are generally interested in using the media to provide information on preventive and control measures via public service announcements, while journalists may focus on disseminating news. A balance between the two interests should be established by negotiation.
- The kind of information to be disseminated will depend on the level of the media – local, national or international.

Community engagement

- Community engagement is a process of including at-risk and affected communities in the cholera control response throughout the process, from planning and surveillance to implementation and monitoring. It promotes and facilitates community ownership in the response.
- The purpose of community engagement – as a complementary strategy to risk communication – is to multiply the effect of information and communication about preventive actions.
- Community engagement proceeds through in-depth interpersonal outreach and dialogue to plan local solutions that are specific to a community's (or individual's and family's) needs. It recognizes challenges and builds upon locally defined opportunities for people to be able to practice behaviours that stop cholera transmission.
- Outcomes of effective community engagement are foremost about community ownership of the response and include increasing trust, confidence and cooperation with response teams, community feedback and uptake of preventive practices.

- Best practices for community engagement include:
 - identifying and using trusted, community-appointed people as entry points for response teams to work with the at-risk community;
 - facilitating a local risk assessment and using locally generated data to develop an implementation plan for the community to remain cholera free or to rapidly interrupt transmission;
 - forming a small local task team comprising trusted leaders, respected members of the community, religious representatives and youth and women’s group members who are responsible for engaging with the response teams and monitoring implementation of the local plan;
 - facilitating routine feedback and engagement between the community and the cholera response team to be able to change the strategy if needed;
 - supporting and building on the mass mobilization efforts of local churches, networks, teachers and vendors to improve the community’s confidence;
 - linking up and using mass media to promote community engagement activities and using local structures to discuss public health advice promoted in the media; and
 - using local communication channels (such as information boards, meetings, social media) to communicate which parts of the response are working, which are not working and how to improve the response.

Additional resources

1. Outbreak communication: best practices for communicating with the public during an outbreak: Report of the WHO Expert Consultation on Outbreak Communications held in Singapore, 21-23 September 2004. World Health Organization. 2005
<https://apps.who.int/iris/handle/10665/69138>
2. Communicating for cholera preparedness and response. UNICEF Cholera Toolkit. 2013 https://www.unicef.org/cholera/index_71215.html
3. Health promotion materials. Centre for Disease Prevention and Control <https://www.cdc.gov/cholera/materials.html>

Section 6. Cholera treatment facilities

Contents

Overview of treatment	37
Access to cholera treatment	37
Oral rehydration points (ORPs)	38
Inpatient cholera treatment facilities (CTUs/CTCs)	39
Staff and supplies at CTUs/CTCs	40
Organization and functions of CTUs/CTCs	41
IPC measures at CTUs/CTCs	43
Evaluation of CTUs/CTCs	46
Additional resources	
Appendix 9. Chlorine solutions according to use	113
Appendix 10. CTU/CTC evaluation form	115

Overview of treatment

- Rapid access to rehydration therapy is the primary treatment for the full clinical spectrum of patients with cholera.
- Patients with no signs of dehydration are treated with oral rehydration solution (ORS) at household level, in the community or in health care facilities. Oral rehydration points (ORPs) are used to deliver ORS.
- Patients with some signs of dehydration are treated with ORS and monitored closely at a cholera treatment facility.
- Patients with severe dehydration require intravenous rehydration, antibiotics, and close monitoring at a cholera treatment facility.

Access to cholera treatment

- Select the location of ORPs and inpatient cholera treatment structures (CTUs/CTCs) to ensure rapid access for patients from affected communities.

- ORPs should be as decentralized as possible and can refer patients to more centralized CTUs/CTCs.
- Factors to be considered in site selection:
 - areas with high incidence rates, large number of patients, high CFR or many deaths reported in the community;
 - areas with poor access to health care for geographic, economic or social reasons.
- Involve the community and local authorities in the site selection, if possible.

Oral Rehydration Points (ORPs)

- Providing rapid access to oral rehydration solution (ORS) saves lives.
- ORPs provide first-line, community-level rehydration, as a highly decentralized element of case management services.
- No specific structure is necessary for the delivery of ORS: ORPs can be fixed or mobile or integrated as part of a healthcare structure, but there is no provision for overnight care for patients. However, basic IPC measures should be implemented to prevent ORPs from being a source of infection.
- ORPs provide oral treatment for patients with suspected cholera and dehydration and refer patients with some or severe dehydration to cholera treatment facilities (after starting ORS if possible).
- ORPs should provide care during all daylight hours, 7 days per week.
- Whenever possible, involve and train community health workers or community volunteers in the preparation and distribution of ORS in the community, assessment and treatment of patients, and referral of patients with some or severe dehydration for further treatment.
- Any programme delivering ORS is also a good mechanism for delivering health and hygiene education messages.

Inpatient cholera treatment facilities (CTUs/CTCs)

- Cholera treatment centres (CTCs) and smaller cholera treatment units (CTUs) are inpatient health-care structures set up during outbreaks to isolate and treat patients with cholera.
- Traditionally, CTUs have a smaller capacity and are attached to existing health facilities, and CTCs are independent structures with larger capacity. However, there is no strict definition of a CTU or CTC, and the names are sometimes used interchangeably. The principles for patient care and hygiene are the same for both.
- CTUs/CTCs should be open 24 hours a day and provide oral and IV rehydration.
- CTUs/CTCs should be established to provide access to treatment for as many patients as possible in the affected areas. When setting up a CTU/CTC, involve the community to ensure that they will use the facilities.
- Although there is no standard design for CTUs/CTCs, several principles should be followed, such as one-directional patient flow and the separation of patient care areas from staff-only areas.
- CTUs/CTCs can be established in isolated wards in hospitals or health centres, in a tent on the grounds of a health centre or in special units in community buildings such as sports facilities.
- During large epidemics, tent-based structures designed to accommodate large numbers of cholera patients may be easier to manage than other options.
- In urban centres or in specific contexts, an intermediate structure, sometimes referred to as a stabilization centre, may be used to provide oral rehydration and, when the patient is severely dehydrated, initiate IV fluid treatment before the patient is transferred to a CTU/CTC.
- CTUs/CTCs must follow strict IPC measures to minimize the risk of propagation.

Staff and supplies at CTUs/CTCs

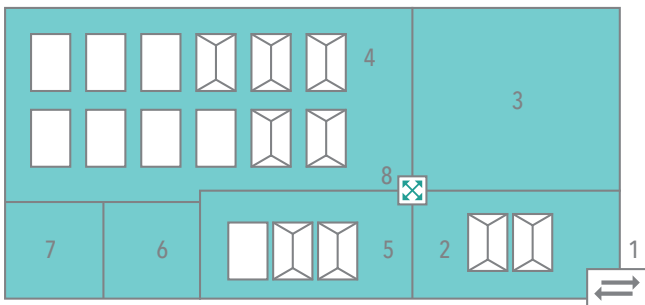
- During the outbreak, CTUs/CTCs must be functional 24 hours a day. Establish a plan for rotation of staff.
- Conduct training in clinical case management so health professionals are able to treat dehydration and common complications. Use protocols validated by the country's Ministry of Health.
- Conduct training in IPC measures, including prevention of transmission at the facility level, use of protective equipment such as gloves and aprons, safe preparation and use of different chlorine solutions, disinfection procedures and waste management.
- Post job aids with treatment and IPC protocols in work areas for quick reference.
- Provide sufficient supplies at every healthcare facility and ORP that might have to treat cases of cholera. Supplies should not be limited to IV fluids; most patients can be treated with ORS alone.
- Prepare sufficient quantities of ORS, using safe water, to cover daily needs.
- ORS should be discarded after 12 hours if kept outside a refrigerator or 24 hours if refrigerated.
- A 3-day supply of water should be stored on site at all times.
- Organize adequate provision of WaSH supplies, including chlorine, residual chlorine testers, cleaning materials, buckets for chlorine solution preparation, protective gear, handwashing stations, waste bins and trolleys/wheelbarrows, body bags, etc.
- Stock management is a key part of running CTUs/CTCs and ORPs. The rate of use of supplies can vary greatly during the course of an epidemic. A minimum supply to cover 3 days or longer should be kept on site, depending on reliability and regularity of supply delivery. There should be dedicated staff to manage supplies, if possible.

Organization and functions of CTUs/CTCs

- The organization of CTUs/CTCs should facilitate caring for patients with cholera while minimizing the risk of becoming a source of infection.
 - The different areas of the structure (such as patient treatment areas and areas for staff only) must be clearly delineated.
 - Patient flow is one-directional and follows strict rules.
 - Only one caregiver should be present with each patient.
 - There are clear entry and exit points.
 - CTUs/CTCs must have separate latrines and baths/showers for patient use only. If possible, staff should have separate facilities.
 - Patient care areas should be gender segregated whenever possible.
 - Special considerations should be made for vulnerable groups, such as persons with disabilities, elderly people and pregnant women, when constructing latrines and showers/bathing units.
- Main functions to be ensured in CTUs/CTCs include:
 - assessment of patients' dehydration status;
 - registration of patients;
 - provision of treatments, including IV fluids, ORS therapy, zinc, and antibiotic therapy;
 - provision of direct patient care, including feeding and personal hygiene;
 - prevention and control of infection through appropriate measures related to water treatment, cleaning and disinfecting the treatment structure, food preparation, laundry, waste management, cleaning and disinfecting patient transport vehicles and the handling of corpses;
 - offering health and hygiene education for patients, relatives and caregivers; and

- ensuring security and a protected environment by having a watchman for information and patient flow control and protection of stocks (food, drugs, supplies) and fences, as needed.
- Organize the CTUs/CTCs into the following areas (figure 2):
 - entrance and exit (screening of patients and handwashing area)
 - observation area for patients with no or some dehydration (plan A and B)
 - hospitalization area for patients with severe dehydration (plan C)
 - staff area for supplies, offices, etc.
 - recovery area for patients with no remaining signs of dehydration
 - waste area (laundry, waste pits, etc.)
 - morgue

Figure 2. Layout of a CTU/CTC



Legend

- | | | | |
|--|----------------------------------|------------------|-----------------|
| 1. Entrance/Exit and Disinfection Area | 3. Staff Area (Kitchen, Laundry) | 5. Recovery Area | 7. Waste Area |
| 2. Observation Area | 4. Hospitalization Area | 6. Morgue | 8. Traffic Flow |

IPC measures at a CTU/CTC

IPC measures are critical to prevent treatment structures from being a source of cholera infection. Adequate WaSH services are indispensable elements for patient care and for IPC in and around CTUs/CTCs.

- Organize the CTUs/CTCs in clearly separated areas and with a one-way flow of patients.
- Ensure that handwashing facilities with soap and safe water are available and maintained in the CTU/CTC for health professionals and patients' caregivers in each ward and at the entrance and exit.
- Guarantee regular provision of buckets, clothes, chlorine, cleaning materials, protective gear, sprayers, waste bins and cholera cots.
- Ensure there are measures in place for the safe disposal of excreta and vomit. When possible, latrines for cholera patients should be separate from latrines used by others. When possible, latrines should be gender segregated.
- Ensure there is enough water to cover the daily needs of patients, caregivers and staff, estimated to be 60 litres per patient per day and 15 litres per person per day for caregivers, although this might vary according to context, culture and climate. If there is not a water source on site or nearby that is protected from contamination and well managed, and which can provide sufficient water for the facility, then ensure provision with water trucks.
- Prepare chlorine solution for disinfection according to use (see appendix 9 – chlorine solutions according to use).
 - Use 2% chlorine solution for disinfecting corpses and body fluids (including vomit, faeces).
 - Use 0.2% chlorine solution for disinfecting all parts of the cholera wards, floors, latrines, kitchen, toilets and shower/bathing units, beds or cots, patient's bedding and linens, clothing, utensils, containers and dishes, waste containers and covers, vehicles used for transporting patients and personal protective equipment (gloves, aprons, goggles, etc.).

Table 1. Mode of transmission and essential rules at the CTU/CTC

Mode of transmission	Essential rules at the CTU/CTC
People	<ul style="list-style-type: none">• Limit access to treatment structure only to patients, one caregiver per patient and staff.
Water	<ul style="list-style-type: none">• Provide safe water.• Ensure a large quantity of safe water is available (approximately 60 litres per patient per day and 15 litres per person per day for caregivers).• Store a 3-day supply of water on site at all times.
Hands	<ul style="list-style-type: none">• Provide handwashing stations with safe water and soap in sufficient quantities.• Wash hands with water and soap:<ul style="list-style-type: none">– before and after taking care of patients– after using latrines– before cooking or eating– after leaving the admission ward.• If soap is not readily available, use ABHR or ultimately 0.05% chlorine solution.
Food	<ul style="list-style-type: none">• Cooked food should be eaten hot.• Ideally, food should be provided by the CTU/CTC.• Food handlers should follow strict hygiene practices.• No leftover food should be taken home by patients, caregivers or staff. It should be disposed of on site.
Patients' clothes and bedding	<ul style="list-style-type: none">• Wash clothes and bedding with the appropriate chlorine solution (0.2%).• If chlorine is not available, patients' bedding and clothing can be disinfected by stirring for 5 minutes in boiling water and drying in direct sunlight, or by washing with soap and drying thoroughly in direct sunlight.

Mode of transmission	Essential rules at the CTU/CTC
Environmental contamination (faeces and waste)	<ul style="list-style-type: none"> • Ensure exclusive gender-separated latrines and baths/showers for cholera patients. • Disinfect buckets, soiled surfaces and latrines regularly with 0.2% chlorine solution. • Use an incinerator for medical waste.
Corpses	<ul style="list-style-type: none"> • Create a separate specific area for a morgue. • Disinfect corpses with 2% chlorine solution.

- Soapy water should be used in hand-washing stations for bare hands and skin. If soap is not available, use alcohol-based hand rubs (ABHR). If soap and ABHR are not available, use 0.05% chlorine solution.
- Healthcare workers should perform handwashing according to WHO's "Five moments of hand hygiene":
 - before touching a patient
 - before performing clean or aseptic procedures
 - after body fluid exposure/risk (that is, after handling any potentially contaminated equipment or material such as laundry, wastes, dishes, vomit and stool buckets)
 - after touching a patient
 - after touching patients' surroundings
- Other important moments when healthcare workers should wash their hands include upon entering and exiting patient areas, after using a latrine (or handling a child's faeces), after handling corpses and before food preparation and handling.
- Patients' bedding and clothing should be disinfected with 0.2% chlorine solution and dried in the sun. If chlorine is scarce or not available, they can be disinfected by stirring for 5 minutes in boiling water and drying in direct sunlight, or by washing with soap and drying thoroughly in direct sunlight.

- Ensure adequate management of waste, as well as drainage.
 - Establish a functional drainage system in the CTU/CTC to avoid flooding of contaminated areas (latrines, laundry, waste area).
 - Ensure CTC/CTU site drainage is managed and does not flow into neighbouring areas or contaminate the water table.
 - Ensure body fluids (including stool and vomit) are emptied regularly in the latrines of cholera patients.
 - Pouring chlorine directly into latrines is not recommended.
 - Plastic buckets or other containers used to transport body fluids should be disinfected using 2% chlorine solution.
 - Cleaners, staff working with chlorine, and waste managers should be adequately trained in IPC and equipped with appropriate protective equipment. Protective equipment and clothing should be washed with a 0.2% chlorine solution and dried in the sun.
- Ensure essential rules are respected at the CTU/CTC to minimize the risk of propagation (table 1).

Evaluation of the CTU/CTC

- Timely access to appropriate rehydration is key in preventing deaths due to cholera. If treatment is managed appropriately, no admitted patient should die due to cholera.
- Deaths can occur from delays in arriving to the CTU/CTC or from delays in receiving adequate emergency treatment due to, for example, overwhelmed staff, lack of adequately trained staff or insufficient supplies.
- During an outbreak, many patients may require emergency care at the same time, therefore it is essential that CTUs/CTCs and other health facilities be prepared in advance to respond.
- Conduct an evaluation of the health facilities to identify gaps and actions that should be implemented to ensure appropriate access to treatment (see appendix 10 – CTU/CTC evaluation form).

- Main elements that should be assessed include:
 - water supply, storage and quality
 - IPC measures
 - facility layout and organization
 - screening, admission and observation areas
 - hospitalization area
 - kitchen and meal preparation areas
 - water and sanitation, latrines, laundry and baths/showers, including drainage and potential to contaminate the water table
 - waste management
 - management of corpses
 - procedures and protocols in place
 - stocks and supplies
 - data management
 - staffing
 - health and hygiene education.

Additional resources

1. Technical Note Organization of Case Management during a Cholera Outbreak. Global Task Force on Cholera Control. June 2017
https://www.who.int/cholera/task_force/GTFCC-Case-Management.pdf?ua=1
2. Cholera outbreak: assessing the outbreak response and improving preparedness. Global Task Force on Cholera Control. 2010
<https://www.who.int/cholera/publications/OutbreakAssessment/en/>

- 3. Managing a cholera epidemic. Chapter 6. Setting up cholera treatment facilities and chapter 7. Organisation of cholera treatment facilities. MSF. August 2017.**
<https://samumsf.org/sites/default/files/2018-10/Management%20of%20a%20Cholera%20Epidemic.pdf>
- 4. Case management and infection control in health facilities and treatment sites. UNICEF Cholera Toolkit. 2013**
https://www.unicef.org/cholera/index_71215.html
- 5. Technical Note: Water, Sanitation and Hygiene and Infection Prevention and Control in Cholera Treatment Structures. Global Task Force on Cholera Control. January 2019**
https://www.who.int/cholera/task_force/technical-note-WASH-IPC-CTCCTU-2019.pdf?ua=1

Section 7. Case management in treatment facilities

Contents

Overview of case management	49
Assessment and triage of the patient	51
Patient registration and admission	51
Treatment plans	51
Complications	56
Antibiotic treatment	56
Zinc supplementation for children	57
Discharge and health and hygiene education	58
Oral rehydration solution preparation	59
Treatment of cholera in children with severe acute malnutrition (SAM)	59
Treatment of cholera in pregnancy	60

Additional resources

Appendix 11. Flow chart for cholera case management	117
Appendix 12. Admission and triage form	118
Appendix 13. Methods for household water treatment	120

Overview of case management

- Without treatment, cholera can kill up to 50% of patients with severe disease. Timely and appropriate treatment significantly reduces the risk of death.
- Although the benchmark for cholera treatment is a CFR of less than 1%, deaths from dehydration from cholera should not occur.
- Approximately 80% of people infected with cholera do not develop symptoms of the disease; these individuals can still transmit the disease by shedding *V. cholerae* bacteria in the environment. Bacteria are present in their faeces for up to 14 days after infection.

Table 2. Degree of dehydration, signs and treatment plans for cholera patients

Degree of dehydration	Signs	Treatment	Admission to CTU/CTC
Severe dehydration	<p>One or more danger signs:</p> <ul style="list-style-type: none"> • Lethargic or unconscious • Absent or weak pulse • Respiratory distress <p>OR at least 2 of the following:</p> <ul style="list-style-type: none"> • Sunken eyes • Not able to drink or drinks poorly • Skin pinch goes back very slowly (>2 seconds) 	PLAN C	Yes
Some dehydration	<p>No danger signs AND at least 2 of the following:</p> <ul style="list-style-type: none"> • Irritable or restless • Sunken eyes • Rapid pulse • Thirsty (drinks eagerly) • Skin pinch goes back slowly 	PLAN B	Yes
No dehydration	<ul style="list-style-type: none"> • Awake and alert • Normal pulse • Normal thirst • Eyes not sunken • Skin pinch normal (disappears immediately) 	PLAN A	No

- Among symptomatic patients, approximately 20% will develop profuse watery diarrhoea that leads to severe dehydration and death if not treated.
- Severity of illness correlates with the number of *V. cholerae* bacteria ingested, lack of immunity acquired by prior exposure to the infection or vaccination, lack of breastfeeding and consequent lack of passive immunity for infants, malnutrition, immunocompromised state, reduced ability to produce gastric acid (which neutralizes the pathogen) and having blood group O.

Assessment and triage of the patient

- Assessing the degree of dehydration of the patient will determine the treatment plan (table 2).
- Severe dehydration is a medical emergency. Rapid diagnosis and treatment can save lives.
- Patients with no signs or some signs of dehydration can be treated successfully by prompt administration of ORS.
- Patients with some dehydration or severe dehydration should be admitted to CTU/CTC. Patients with no dehydration can be treated at home, at an ORP or in the outpatient area at the CTU/CTC.

Patient registration and admission

- Record the patient in the line list/register used at the CTU/CTC or ORP.
- For each patient, complete the admission and triage form with personal information, clinical data, physical exam and diagnosis, treatment and laboratory data (RDT results, specimens taken and sent for culture). The outcome (discharged, dead, self-discharged, referred) should be completed at later stages. See appendix 12 – admission and triage form.

Treatment plans

- Treatment is based on the degree of dehydration of the patient: no dehydration, some dehydration or severe dehydration. Patients with no signs or some signs of dehydration are treated with ORS (plan A and plan B, respectively). Patients with severe dehydration require IV rehydration (Plan C). See appendix 11 – flow chart for cholera case management.
- Treatment plan A requires rehydration with ORS. It can take place at home, at an ORP or in the outpatient area at the CTU/CTC. Plan A does not require admission to the inpatient area of the CTU/CTC, however, patients who are treated at a structure should be observed for 2 - 4 hours prior to discharge. These patients should also be included in the patient linelist/register.

- Treatment plans B and C require admission to the inpatient area of a CTU/ CTC to correct fluid loss that has already occurred at the time of admission.
- Only patients with severe dehydration require treatment plan C, administration of IV fluids. ORS should also be given when the patient is able to drink safely.
- Antibiotics are indicated in patients with severe dehydration and, regardless of degree of dehydration, in patients with high purging (at least one stool per hour during the first 4 hours of treatment) or treatment failure (the patient is still dehydrated after completing the initial 4 hours of treatment) or in patients with coexisting conditions or comorbidities that pose elevated risk in cholera illness (see antibiotic treatment below).
- In children aged 6 months to 5 years – regardless of the degree of dehydration – zinc supplementation (20 mg p.o. zinc sulphate per day for 10 days) should be started immediately to reduce diarrhoea volume and duration.

Preparing and administering ORS

- ORS must be prepared with safe water treated with appropriate methods (see appendix 13 – methods for household water treatment).
- ORS should be made fresh daily. It should not be stored for more than 12 hours, or 24 hours if refrigerated. Ready-made sachets containing salts and minerals are available for preparing ORS.
- ORS should be given regularly, in small amounts. If a patient vomits the ORS, slow the administration of ORS and then slowly increase again when vomiting stops.
- In addition to amounts of ORS specified in the treatment plan, patients must receive additional ORS to compensate for ongoing losses from continuing diarrhoea and vomiting.

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

- Patients with no signs of dehydration should be treated with ORS.

- There is no need to admit patients with no signs of dehydration to the inpatient area of the CTU/CTC. They can be treated with ORS at home, at ORPs or at the outpatient area at the CTU/CTC.
- If the patient is seen at an ORP or CTU/CTC:
 - keep the patient under observation for 2–4 hours to ensure the person is tolerating ORS; and
 - during observation and before sending patients home, provide clear instructions for care. Advise the patient or caregiver to continue giving ORS after each loose stool and to come back immediately if the patient's condition deteriorates (repeated vomiting, number of stools increased or the patient is drinking or eating poorly).
- Patients should receive ORS after each loose stool to maintain hydration until diarrhoea stops.
- Following each loose stool, provide the following amounts of ORS (table 3).

Plan B. Oral rehydration for patients with some dehydration

- Patients presenting with signs of some dehydration must be admitted to the CTU/CTC.
- For initial treatment, give ORS according the weight of the patient (75 ml/kg) in the first 4 hours.
- Add the specified quantity of ORS to replace on-going diarrhoeal losses (per table 3).

Table 3. Quantity of ORS to be given after each loose stool by age group

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

- Cholera patients with some signs of dehydration do not need IV therapy, but they need to be monitored closely during the first 4 hours.
 - If the patient has severe vomiting or is not able to drink, or if at any time signs of severe dehydration appear, then shift immediately to treatment plan C.
 - If there are still signs of some dehydration after the first 4 hours, repeat treatment plan B for 4 hours and reassess.
 - If there are no signs of dehydration after the first 4 hours of treatment, the patient can be discharged and sent home. 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 the patient is drinking or eating poorly).

Plan C. Intravenous (IV) therapy for severe dehydration

- Severe dehydration is a medical emergency and patients must be treated urgently. Seconds can make a difference.
- Patients with severe dehydration should start IV fluids immediately.
- As soon as the patient can drink, give ORS solution (per table 3) in addition to IV fluids.
- Ringer's lactate is the first choice of IV fluid. If Ringer's lactate is not available, the following IV solutions can be used:
 - normal saline
 - 5% glucose in normal saline
 - cholera saline.
- Plain 5% glucose (dextrose) solution is not recommended.
- Give a total of 100 ml/kg Ringer's lactate solution divided in two periods. The rate of infusion in each period is slower for children younger than 1 year (see table 4).

Table 4. Quantity of Ringer's lactate solution by age group.

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

- More than one IV line may be necessary to give adequate fluid during the first period (bolus treatment).
- When IV rehydration is not possible, and the patient cannot drink, ORS solution can be given by nasogastric tube. Switch to IV rehydration as soon as possible. Do not use nasogastric tubes for patients who are vomiting.
- Other systemic access such as femoral vein or intra-osseous may be used if staff are trained and necessary supplies are available.
- Patients should be encouraged to drink ORS once they are fully conscious and are not vomiting.
- Fluid output should be measured and equivalent volumes of fluid added to the amount described for initial treatment. This fluid can initially be given as IV fluid, but should be given as ORS once patients can drink safely.
- Monitor the patient closely and perform frequent reassessment (every 15–30 minutes).
- After 6 hours in children younger than 1 year or 3 hours in all other patients, perform a full reassessment. If hydration is improved and the patient can drink, switch to treatment plan B if there is still some dehydration or treatment plan A if there are no signs of dehydration.

Complications

- Children with severe acute malnutrition (SAM), elderly people and those with uncontrolled chronic conditions (such as congestive heart failure, diabetes, hypertension) are especially vulnerable to complications.
- Pulmonary oedema can occur if excessive IV fluid is given and renal failure can occur if too little fluid is given; hypoglycaemia and hypokalaemia can occur, especially in children with malnutrition who are rehydrated with Ringer's lactate alone.

Antibiotic treatment

- Antibiotics can reduce the volume and duration of diarrhoea and the period of *V. cholerae* shedding.
- Antibiotics are indicated for:
 - cholera patients hospitalized with severe dehydration
 - patients with high purging (at least one stool per hour during the first 4 hours of treatment) or treatment failure (the patient is still dehydrated after completing the initial 4 hours of rehydration therapy), regardless of the degree of dehydration; and
 - patients with coexisting conditions (including pregnancy) or comorbidities (such as SAM, HIV), regardless of the degree of dehydration.
- Antibiotics are given as soon as the patient is able to take oral medication (once vomiting has stopped).
 - Doxycycline – single dose (300 mg for adults; 2–4 mg/kg for children under 12 years of age) – is the antibiotic of choice for all patients, including pregnant women.
 - If resistance to doxycycline is documented, give azithromycin 1 g or ciprofloxacin 1 g orally as a single dose for adults. For children under 12 years of age, give azithromycin 20 mg/kg (max 1 g) or ciprofloxacin 20 mg/kg (max 1 g) orally as a single dose. See table 5.

Table 5. Antibiotic Treatment

	First-line	Alternative
Adults (including pregnant women)	Doxycycline 300 mg p.o. single dose	Azithromycin 1g p.o. single dose or ciprofloxacin 1g p.o. single dose
Children < 12 years old	Doxycycline 2-4 mg/kg p.o. single dose	Azithromycin 20 mg/kg (max 1g) p.o. single dose, or ciprofloxacin 20 mg/kg (max 1g) p.o. single dose

- The laboratory should monitor patterns of resistance of the strain at the beginning of and during the outbreak and keep the clinical staff updated to adapt the treatment accordingly (see section 4 – monitoring the outbreak).
- Mass chemoprophylaxis is not recommended. Selective chemoprophylaxis can be considered in high-risk settings such as prisons.

Zinc supplementation for children

- Zinc supplementation in the management of children aged 6 months to 5 years with watery diarrhoea (regardless of the cause or degree of dehydration) reduces diarrhoea volume and duration. When available, supplementation (20 mg p.o. zinc sulphate per day for 10 days) should be started immediately.
- Zinc may reduce the absorption of some classes of some antibiotics, including ciprofloxacin. For the best effect with these classes of drugs, antibiotics should be administered 2 hours before zinc or 4–6 hours after zinc.
- Children receiving therapeutic food for the treatment of SAM do not require zinc supplementation, as these foods contain sufficient zinc.

Discharge and health and hygiene education

Consider discharge if the 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

Prior to discharge:

- Patients should be given instructions on when to return to CTU/CTC and on how to prevent cholera.
- Provide patients and their caregivers with ORS and confirm they can correctly prepare and give ORS at home without supervision.
- Inform the patient, family members and caregivers about precautions and instructions at the household level, as follows:
 - Drink and use safe water.
 - Wash your hands with safe water and soap or with ABHR at critical times, including after using a toilet or handling a child's faeces and before preparing and eating food. If caring for a patient, always wash your hands before and after providing care, after handling any soiled items (such as clothes, linens) or after touching any bodily fluids.
 - 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 0.2% chlorine solution. If chlorine is not available, patients' bedding and clothing can be disinfected by stirring for 5 minutes in boiling water and drying in direct sunlight, or by washing with soap and drying thoroughly in direct sunlight.
 - If a household member develops acute watery diarrhoea, administer 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 may be allowed if the ill person wants company; visitors should also observe hand hygiene recommendations.

ORS preparation

- ORS must be prepared with safe water treated with appropriate methods (see appendix 13 – methods for household water treatment).
- ORS should be prepared daily and should not be stored for more than 12 hours at room temperature, or up to 24 hours if refrigerated.
- Ready-made sachets containing salts and minerals are available for preparing ORS. The volume of clean water to be used to dissolve one sachet of ORS is marked on the sachet.

Treatment of cholera in children with SAM

- Malnourished children with cholera are at risk of complications and death.
- Refer children with SAM and suspected cholera for immediate treatment at a cholera treatment facility (CTU/CTC).
- Assessment of the child's malnutrition status and dehydration level will determine the treatment plan.
- For oral rehydration of children with SAM during an outbreak of cholera, give standard ORS. Do not give ReSoMal (Rehydration Solution for Malnutrition).
- For severe dehydration requiring IV therapy, follow rehydration guideline for malnourished children.
- Rehydration of children with SAM must be closely monitored; there is a serious risk of overhydration.
- Breastfeeding and feeding with therapeutic milk should continue throughout rehydration.

Treatment of cholera in pregnancy

- Pregnant women with cholera are at much higher risk of losing their foetuses, compared to the general population of pregnant women. There is no evidence to show that the risk of infection or the severity of a cholera episode is higher among pregnant women.
- The risk of foetal loss depends on the degree of dehydration and vomiting, with more severe dehydration and the occurrence of vomiting increasing the risk of foetal loss.
- Antibiotic treatment should be given to all pregnant women with cholera, regardless of the degree of dehydration. See antibiotic treatment above.
- Dehydration can be difficult to assess in the later stages of pregnancy, resulting in an underestimate of the severity of dehydration. The degree of dehydration and treatment of pregnant women should be closely monitored to maintain dehydration and adequate systolic blood pressure to ensure appropriate uterine blood flow.
- The use of OCV as a preventive measure is considered to be safe and is recommended in pregnancy (see section 9 – oral cholera vaccine).
- In large outbreaks, organize the CTCs/CTUs to ensure privacy for pregnant women, especially during labour and delivery, and ensure access to reproductive health services.

Additional resources

1. Technical Note Organization of Case Management during a Cholera Outbreak. Global Task Force on Cholera Control. June 2017
https://www.who.int/cholera/task_force/GTFCC-Case-Management.pdf?ua=1
2. Cholera outbreak: assessing the outbreak response and improving preparedness. Global Task Force on Cholera Control. 2010
<https://www.who.int/cholera/publications/OutbreakAssessment/en/>

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https://www.who.int/cholera/task_force/use-of-antibiotics-for-the-treatment-of-cholera.pdf?ua=1
5. Updates on the management of severe acute malnutrition in infants and children. World Health Organization. 2013.
[http://www.who.int/nutrition/publications/guidelines/updates_management_SAM_infantandchildren/en/Management of severe acute malnutrition in infants and children.](http://www.who.int/nutrition/publications/guidelines/updates_management_SAM_infantandchildren/en/Management%20of%20severe%20acute%20malnutrition%20in%20infants%20and%20children)

Section 8. Reducing the spread of cholera in the community

Contents

Common sources of cholera infection in the community	63
Social mobilization and community engagement	64
Access to safe water	65
Safe food preparation	68
Hygiene and access to improved sanitation	68
Safe funeral practices and handling of corpses in the community	69

Additional resources

Appendix 13. Methods for household water treatment	120
Appendix 14. Preparation and use of 1% chlorine solution to disinfect water	123
Appendix 15. Rules for safe preparation of food to prevent cholera	127

Spread of the disease within an area can be reduced through early detection and confirmation of cases, followed by an appropriate, well-coordinated multisectoral response. To facilitate rapid and effective response to outbreaks, countries at-risk of cholera should develop and implement cholera preparedness plans and programmes.

Common sources of cholera infection in the community

- Faecal contamination of drinking water at the source (unprotected wells, boreholes, standpipes), during transport or supply, or during storage (for example, by contact with hands soiled by faeces);
- Uncooked food made with or washed with contaminated water, drinks made with contaminated water that are not later boiled, ice made with contaminated water;
- Cooking and eating utensils washed in contaminated water;

- Food contaminated during or after cooking or preparation and allowed to remain at room temperature for several hours provide an excellent environment for the growth of *V. cholerae*;
- Seafood, particularly crustaceans and other shellfish, taken from contaminated water and eaten raw or insufficiently cooked or contaminated during preparation;
- Fruit and vegetables grown at or near ground level and fertilised with night soil, irrigated with water containing human waste or rinsed with contaminated water, and then eaten raw, or contaminated during handling, washing and preparation;
- Many of the above sources will be found at markets and/or food vendor stalls and at transport hubs (e.g. bus stations);
- Additional sources of contamination include bodies of people who have died of cholera, including during burial ceremonies where corpses are touched or where food is shared; and
- Household members and close neighbours of cholera patients are at increased risk of cholera in the days immediately following the patient's illness. Risk decreases with time and distance.

Social mobilization and community engagement

- An epidemic of cholera can be controlled more quickly when the affected people know how to protect themselves and their relatives and the community is engaged to help limit the spread of the disease.
- Develop or use a prepared set of harmonized messages on the prevention of cholera, pre-test them in the community and ensure that they are validated by the Ministry of Health and used by all partners. Focus group discussions, direct observations, KAP surveys, etc. can help to determine local knowledge and practices in relation to cholera to guide messages.
- The messages should have limited text and contain illustrations of practical demonstrations (such as images showing procedures for chlorination of water, preparation of ORS, handwashing) and be aligned with ongoing cholera prevention programmes (for example, if water treatment products are being distributed, adapt messages to these products).

- Adapt messages to local cultural beliefs about the disease and to the capacity for implementing control measures in the community (for example, if soap or chlorine are unavailable, recommend ash or lime for washing hands).
- Select the best way to disseminate messages to the community.
 - Communicate messages through mass media (such as radio, TV, press releases, social media, SMS), small media (including leaflets, posters, caps, T-shirts, songs), interpersonal communication (for example, briefing sessions with community or religious leaders and talks in places where people usually gather, such as healthcare facilities, hairdressers, churches, mosques, transport hubs, markets).
 - Adapt messages to target groups (such as males, females, adolescents, people who are illiterate) and give them in the local language.
 - This type of messaging should be part of multisectoral approach targeting areas reporting high numbers of patients.

For additional information see Section 5 – risk communication and community engagement.

Access to safe water

- Access to safe drinking water for the affected population is essential to reduce the spread of the disease in the community. When possible, also provide access to safe drinking water in the unaffected areas that are at high risk for cholera.
- Even if the drinking water source is safe, water can easily be contaminated during its collection, transportation and storage in the household. A safe water intervention should therefore begin with an improved water source and be followed by safe water collection, handling and storage.

- Analysis of the context will determine the best method for water treatment (at the source or at point of use). Selection of the water treatment method (such as filtration, disinfection, chlorination) will depend on the resources and techniques available and the parameters (physical and microbiological) of the water to be treated. Combining treatments (used together, either simultaneously or sequentially) will increase the effectiveness.
 - In high-turbid water, a pre-treatment (sedimentation, flocculation or coagulation) might be necessary to remove suspended particles and reduce turbidity before disinfection or chlorination. Turbidity levels can be tested with a turbidity tube.
- If water is chlorinated, regularly monitor FRC levels and maintain the appropriate level by adapting the dosing and frequency of chlorination as necessary.
 - Recommended FRC after 30 minutes of contact time is 1 mg/L for water at the source (wells and boreholes) and 0.5 mg/L at the point of use (at the tap, or storage container).
 - The optimal pH range in which chlorine is effective is 6.5–8.5. FRC levels and pH can be tested with a photometer or colorimeter (commonly known as a pool tester).
- When the quality of water at the source cannot be guaranteed, a treatment process is needed to disinfect the water at point of use (at the tap, vessels or storage containers).
- Various methods of household water treatment are available, including: boiling, disinfection, chlorination and filtration.
 - If household water treatment products are promoted, ensure that households understand the water treatment techniques and the residual effect of chlorine (if used).
 - To facilitate the correct preparation of household water treatment products, ensure that households have appropriately sized water containers, preferably closed and narrow-mouthed.

- Ensure that households are involved in water quality monitoring programmes when chlorine is used for household water treatment.
- Safe water collection, transport, handling and storage also need to be ensured and water quality monitored regularly to minimize the risk of microbial regrowth. To minimize the risk of contamination:
 - encourage the use of closed, narrow-mouthed containers with a protected dispenser (spigot, spout) for extracting water. Containers should be cleaned regularly and good hand hygiene should be ensured to reduce potential contamination when filling or extracting water; and
 - if not available, ensure drinking water is kept in a clean, covered container such as a bucket or large pot.
- Deliver WaSH messages to prevent cholera. Provide household water treatment products and closed, narrow-mouthed water containers in the community to support good hygiene practices, as appropriate. Areas reporting cases should be prioritized.
- Ensure health workers and staff or volunteers working in the community are trained to teach local people about safe water treatment methods, including collection, transport, handling and storage. Education around hand hygiene when filling or extracting water is also important to reduce the risk of contamination.
- Involve the community in development and monitoring of interventions that provide access to safe water to prevent cholera.

For additional information see Appendix 13 - methods for household water treatment and Appendix 14 - preparation and use of 1% chlorine solution to disinfect water.

Safe food preparation

- Safe food preparation is important to reduce the transmission of cholera in the community.
- Food can be contaminated with *V. cholerae* during production, preparation or consumption.
- The basic rules for safe food preparation should be included as part of health and hygiene promotion programmes.
- For details on safe food preparation see appendix 15 – rules for safe preparation of food to prevent cholera.
- Street vendors and marketplaces with inadequate access to safe water and sanitation or inadequate hand hygiene can play an important role in spreading cholera.
 - Reinforce food safety laws and inspection of restaurants, food vendors and food processing factories and avoid unsafe agricultural practices (such as using sewer water to irrigate crops).
 - Train on or reinforce safe food preparation practices.
 - Promote hand hygiene and set up handwashing stations with soap and safe water in markets and places selling food.
 - Distribute IEC materials on safe food preparation and hygiene messages.

Hygiene and access to improved sanitation

- It is important to isolate faeces to avoid contamination of food and water with faecal matter.
- Improve access to sanitation facilities (for example, latrines connected to a public sewer or to a septic tank, pour-flush latrines, simple pit latrines, ventilated improved latrines). Latrines should be placed in locations that will not contaminate any drinking water source (at least 30 metres away from any water source and 2 meters above groundwater).

- Discourage open defecation and work with the community to ensure safe disposal of excreta.
- Ensure safe excreta management and disposal during the outbreak. However, avoid latrine emptying during cholera outbreaks. If latrines must be emptied, take all precautions to avoid contamination during emptying and ensure excreta is disposed of safely.
- Involve the community in all phases of design and implementation of on-site sanitation projects to ensure access to and use of the facilities. Set up handwashing stations with soap and safe water near all latrines.
- Ensure health workers are properly trained to teach local people about good hygiene practices and the links between sanitation, water supply, health and hygiene behaviours.
- Promote strong hygiene programmes to ensure the success of sanitation programmes. Focus should include handwashing after defecation and after handling the faeces of a child.

Safe funeral practices and handling corpses in the community

- Funerals for persons who have died of cholera can contribute to the spread of an epidemic.
 - Bodies of people who have died of cholera pose a risk of transmission because body fluids contain high concentrations of *V. cholerae*.
 - Funerals can contribute to the geographical spread of cholera, as people who attend the ceremony may be infected and take the disease back to their communities.
 - Contamination may occur during funerals when food and drinks are prepared by individuals who prepared or touched the body.
- Always consider social, cultural and religious beliefs and practices. The family must be fully informed about the dignified burial process

and their religious and personal rights. Ensure that they agree to all modifications of cultural practices before starting the burial.

- It is important to have a discussion with community leaders to find a way to respect community practices and keep the population safe through preventive measures, including the following.
 - Avoid large funeral gatherings. If not possible, ensure all protective measures are in place, including handwashing facilities (soap and safe water, ABHR or, if these are not available, 0.05% chlorine solution) available to funeral participants.
 - Avoid allowing people attending funerals to touch the body of the deceased. If the body must be touched, those in contact with the body should immediately wash their hands and avoid touching their mouths. Disposable gloves that are immediately discarded can also be used. Kissing the body should not be allowed.
 - Avoid serving food at the funeral. If food is served, it should be eaten hot and handwashing should be compulsory before preparing or eating food. A designated health worker present at the funeral gathering can be helpful in supervising and supporting the use of hygienic practices.
- To prevent the spread of cholera, handling of corpses should be kept to a minimum and burial should take place as quickly as possible (preferably within 24 hours after death).
- Trained staff who wash and prepare the body must wear gloves, aprons and masks. The body should be cleaned with 2% chlorine solution. Do not empty the intestines. Trained staff should fill the mouth, nose and anus of the body (but not the vagina) with cotton wool soaked with chlorine solution.
- Minimize the handling of bodies of people who have died of cholera. For transport of people who have died of cholera, individuals carrying the body should wear gloves. The body should be carefully wrapped, preferably in a body bag. Only trained personnel should handle bodies during the burial process.

- Disinfect the dead person's clothing and bedding with the appropriate chlorine solution (0.2%). If chlorine is not available, bedding and clothing can be disinfected by stirring for 5 minutes in boiling water and drying in direct sunlight, or by washing with soap and drying thoroughly in direct sunlight.
- If requested, family members may be present during the preparation of the body for burial. They must be informed of how to protect themselves from infection and be provided with necessary personal protective equipment and handwashing facilities.

Additional resources

1. Cholera outbreak: assessing the outbreak response and improving preparedness. Global Task Force on Cholera Control. 2010
<https://www.who.int/cholera/publications/OutbreakAssessment/en/>
2. Communicating for cholera preparedness and response. UNICEF Cholera Toolkit. 2013
https://www.unicef.org/cholera/index_71215.html
3. Hygiene promotion in emergencies. World Health Organization. July 2013.
https://www.who.int/water_sanitation_health/emergencies/WHO_TN_10_Hygiene_promotion_in_emergencies.pdf
4. Managing a cholera epidemic. Chapter 4. Strategies for epidemic response. MSF. August 2017.
<https://samumsf.org/sites/default/files/2018-10/Management%20of%20a%20Cholera%20Epidemic.pdf>
5. Guidelines for drinking-water quality, fourth edition. World Health Organization. 2011
https://www.who.int/water_sanitation_health/publications/2011/dwq_guidelines/en/

Section 9. Oral cholera vaccine

Contents

Use of oral cholera vaccine (OCV)	73
Mass vaccination campaigns	74
Pre-qualified OCVs	75
Use of OCV in pregnant and lactating women and HIV-infected individuals	75
Monitoring and evaluation of OCV campaigns	76

Use of oral cholera vaccine (OCV)

- WHO recommends that the use of OCVs should be systematically considered as an additional measure to limit the spread of disease during cholera outbreaks, to contribute to cholera control in humanitarian crises with high risk of cholera, and in endemic areas.
- OCVs should be used in conjunction with other cholera prevention and control strategies.
- Vaccination should not disrupt the provision of other high-priority health interventions to control or prevent cholera.
- Geographical areas and populations to be targeted for OCVs should be clearly identified following a thorough investigation of the current and historical epidemiological situation and the current local infrastructure and capacities.
- Vaccination should cover as many people who are eligible to receive the vaccine as possible and should be conducted as quickly as possible.
- The global OCV stockpile was created in 2013 for deployment of OCV to countries in need.

Mass vaccination campaigns

Mass vaccination campaigns with OCV can be used during cholera outbreaks, in humanitarian crises with high risk of cholera, or as part of cholera control in endemic settings.

- Vaccination during cholera outbreaks is used to contain ongoing outbreaks (if implemented early) and to limit the spread of the outbreak into new areas (such as neighbouring communities and those across borders, or areas linked by river systems or water and sanitation systems).
 - The geographic areas and populations to vaccinate are determined following in-depth analysis of the historical and current epidemiological data and current risk factors.
 - Based on current evidence on short-term protection, a single-dose strategy could be considered. Administering a second dose should be considered to ensure longer-term protection if the risk of cholera persists.
- Vaccination in humanitarian crises with high risk of cholera is used to prevent outbreak occurrence.
 - The decision to vaccinate should be guided by a thorough investigation of the current and historical epidemiological situation, an assessment of the risk of cholera and the WASH context. This information should be used to clearly identify the geographic areas and populations to target.
 - Campaign planning should be carried out to ensure that vaccination takes place prior to any known cholera season.
 - Preparation, including microplanning, cold chain preparation, logistics and social mobilization should be carried out to ensure high vaccine coverage as soon as vaccines become available in the area.
- Vaccination in endemic areas or hotspots is used to reduce disease transmission and to reduce the incidence of the disease. Preventive vaccination should be considered as an additional control measure and implemented in conjunction with other long-term and sustainable measures.

Prequalified OCVs

- Three OCVs are currently prequalified by WHO: Dukoral[®], Shanchol[™] and Euvichol-Plus[®].
- All are oral, killed, whole-cell vaccines that provide sustained protection of greater than 60% for at least 2 years in endemic populations, induce an immune response relatively quickly and have a good safety profile.
- Shanchol[™] and Euvichol-Plus[®] are the two vaccines available through the global stockpile for use in mass vaccination campaigns.
- Shanchol[™] and Euvichol-Plus[®] are killed modified whole-cell bivalent (O1 and O139) vaccines. Shanchol[™] and Euvichol-Plus[®] have the same formulation and comparable safety and immunogenicity profiles. Shanchol[™] and Euvichol-Plus[®] are each recommended to be given as a two-dose regimen, with the two doses given a minimum of 14 days apart. The recommended age for vaccination is 1 year or older.
- These OCVs are effective tools for cholera control. Two doses provide protection against cholera for at least 3 years. One dose provides short-term protection (at least 6 months), which has important implications for outbreak management.
- Several additional cholera vaccines are in different stages of development; these are mainly live attenuated vaccines that have the potential to provide longer-term protection with a single dose.

Use of OCV in pregnant and lactating women and HIV-infected individuals

- Based on analysis of the risks and benefits, there are considerable benefits and very few risks from including pregnant and lactating women and HIV-infected individuals in a vaccine campaign.

Monitoring and evaluation of OCV campaigns

- OCVs have been used extensively in multiple settings globally and have been proven to be safe. Passive surveillance of adverse events following immunization should be conducted systematically following national policies.
- Monitoring and evaluation following vaccination (such as coverage surveys, cost-effectiveness analysis, impact assessment on disease burden, etc.) provide essential information to ensure quality provision of services and the development of future recommendations for OCV use.

Additional resources

1. Cholera vaccines: WHO position paper. Weekly Epidemiological Record. World Health Organization. August 2017
<https://apps.who.int/iris/bitstream/handle/10665/258763/%20WER9234.pdf?sequence=1>
2. Oral Cholera Vaccine stockpile for cholera emergency response. World Health Organization. 2013
https://www.who.int/cholera/vaccines/Briefing_OCV_stockpile.pdf?ua=1
3. Technical Note. Evidence of the risks and benefits of vaccinating pregnant women with WHO pre-qualified cholera vaccines during mass campaigns. Global Task Force on Cholera Control. November 2016
https://www.who.int/cholera/vaccines/Risk_Benefits_vaccinating_pregnant_women_Technical_Note.pdf?ua=1

Section 10. Preparedness and long-term actions

Contents

Preparedness plans	77
Recommendations for improved preparedness	79
Long-term interventions	83

Preparedness plans

- Preparedness is the process of ensuring readiness for a cholera outbreak in advance so that the response will be more effective.
- Preparedness can lead to a faster, more efficient response, reducing both morbidity and mortality.
- A preparedness plan identifies the steps required to prepare for a cholera outbreak, including gap analysis and capacity-building activities, pre-positioning of supplies, adapting and pre-positioning of IEC materials, identification of partners and pre-defined agreements for response implementation and coordination. If a preparedness and response plan already exists, review the plan and update it regularly.
- When an outbreak is over, a retrospective evaluation is essential to pinpoint strengths and weaknesses of the response in order to help improve preparedness for and response to future outbreaks.
- In countries where cholera outbreaks occur regularly, in addition to outbreak preparedness and response, long-term cholera control and elimination should be a priority. If not already initiated, outbreaks provide a good opportunity to initiate this type of discussion.
- Many programmes and activities that are part of preparedness planning will contribute to longer-term efforts.

- National cholera control and elimination plans (NCPs) should be developed in line with GTFCC's Ending Cholera: A Global Roadmap to 2030.
- Preparedness activities include the following:
 - Reinforce surveillance and ensure reporting on cholera, including zero reporting.
 - Conduct periodic meetings with all key stakeholders involved in outbreak coordination and response to define and/or reassess the cholera coordination and information management system.
 - Identify geographic areas and populations at-risk by reviewing epidemiological data, past situation reports and maps, WaSH and health coverage and any other contextual information, such as climate information, conflict updates and locations of refugee camps and migration routes.
 - Review key guidelines, protocols and procedures as available. If they are out of date, update them in line with the latest WHO standards.
 - Identify the national workforce, map all partners and describe their roles and areas of action. Assess the partners' capacity to prepare for and respond to cholera outbreaks.
 - Identify and map the current availability of supplies and estimate the needs. Include these needs in the existing procurement system for storage and distribution.
 - Estimate the available funds and funding sources for prevention, preparedness and response.
 - Conduct periodic training and, if possible, conduct a simulation exercise, to practice the response process before an outbreak occurs.
 - In countries vulnerable to cholera, preparedness plans should also be in place at subnational levels, by region, district or equivalent area, depending on the size and structure of the country.

Recommendations for improved preparedness

Outbreak detection

- Based on previous outbreaks, assess how health authorities were notified of the outbreak and identify the main weaknesses of the surveillance system, resources available and procedures in place in order to increase sensitivity of detection of cholera outbreaks and improve the timeliness and effectiveness of the response.
- Conduct periodic training sessions for health professionals and community health workers to increase their awareness of the disease, case definitions, data collection and reporting procedures (this should be part of training on case management).
- Reinforce or implement community-based surveillance for early detection of cases, immediate reporting and rapid implementation of control measures.
- Consider including private clinics, traditional healers, NGOs and National Red Cross and Red Crescent Societies, and use unofficial sources of information (such as journalists, community leaders, school teachers).
- Pre-position RDTs, rectal swabs and transport media at all health facilities in the areas at high risk of cholera. Conduct training on the use of RDTs and collection and transport of stool samples.
- Establish multidisciplinary teams trained and prepared for rapid deployment to conduct field investigations and implement initial control measures.

Outbreak confirmation

- Disseminate standard case definitions to healthcare workers before the expected cholera season to help increase awareness and ensure adequate diagnosis.
- Ensure regular provision of laboratory supplies for collection and transport of stool samples to the reference laboratory for confirmation.
- Train laboratory staff to culture *V. cholerae* and conduct antimicrobial susceptibility testing.

- Ensure that peripheral laboratories in areas with recurrent outbreaks have adequate supplies to perform culture confirmation and antimicrobial susceptibility testing.
- Establish links with international reference laboratories for external quality control and for shipment of specimens for further characterization (such as DNA-based molecular testing).

Organization of the response

- Establish a multisectoral cholera coordination committee and ensure that they meet regularly in areas where cholera outbreaks are recurrent.
- Identify all stakeholders and their scopes of action and capacities and involve them in planning. Strengthen collaboration among the Ministry of Health, other government institutions and agencies in charge of WaSH, and partners.
- Develop and maintain good relationships with donors by organizing regular briefings to provide regular information on the epidemiological situation, the effectiveness of the outbreak response and any remaining gaps.
- Prepare a list of available supplies and anticipated needs before the outbreak.

Monitoring the outbreak

- Periodically train healthcare workers in surveillance (case definitions, data collection and reporting) even when there is no outbreak. As with outbreak detection, this should be part of training that includes case management.
- Conduct regular analysis of baseline data (time, place, person) before the cholera season to be able to compare data between years.
- It may be valuable to conduct epidemiological studies to identify high-risk activities or practices and to develop programmes to modify them in order to prevent cholera transmission.
- It is also recommended to identify "hotspots" (areas where outbreaks regularly occur).

Treatment and cholera treatment facilities

- Organize regular specific training in case management aimed at health professionals. Establish a training plan to achieve the goal of training all healthcare workers. Training should also include case definitions, data collection and reporting to improve outbreak detection and monitoring.
- Identify sites for CTUs/CTCs before an outbreak occurs. Ensure provision of adequate supplies to treat patients.
- Prepare in advance individual job descriptions for personnel in CTUs/CTCs.
- Reinforce IPC measures through regular trainings for all staff working in health care facilities.
- Provide standard treatment protocols to all health facilities.
- Ensure that WaSH activities, including waste management, are in place at healthcare facilities and based on national standards. Organize specific training as necessary.
- Store supplies at district levels in areas at high risk of cholera to facilitate rapid distribution.
- Do not limit pre-positioned supplies to supplies to treat patients, such as IV fluids and ORS. Include IPC and WaSH supplies such as soap, chlorine, water quality monitoring equipment, buckets, handwashing stations, cholera cots and personal protective equipment.
- In remote health facilities, ensure provision of supplies and drugs to treat the first 10–20 patients as it may take time to deliver supplies to these areas once an outbreak begins.

Health and hygiene promotion, social mobilization and community engagement

- Engage at-risk communities in the cholera preparedness plan. Identify and train community-appointed people, such as respected members of the community, religious representatives and youth and women's group members.

- In advance of the cholera season, organize focus group discussions in high-risk communities to identify gaps in knowledge about cholera prevention.
- Prepare, update and distribute IEC materials in at-risk areas before an outbreak occurs.
- Check whether soap and products to treat water are available and affordable for the community and develop programmes accordingly.
- Assess the impact of the messages used previously and improve or adapt the communication with communities.
- Maintain social mobilization and community engagement about the prevention of diarrhoea throughout the year as part of community-level activities, with intensification before the cholera season, especially in high-risk areas.
- Conduct long-term promotion on hygiene and sanitation practices such as handwashing with soap, safe disposal of children's faeces and use of sanitary facilities for defecation.

Risk communication

- Develop a communication strategy and define key cholera prevention messages before an outbreak. Identify effective means of communication with the population.
- Designate a spokesperson and define risk communication procedures to answer the most common questions about cholera and how to prevent it.
- Link with and use mass media to promote community engagement activities, and use local structures to discuss public health advice.
- Use local communication channels (such as information boards, meetings, social media) to deliver preventive messages.

Access to safe water and hygiene

- Include emergency provisions of water treatment chemicals, water-quality testing equipment, standby power generators, and materials and supplies for emergency prefiltration, storage and sedimentation as part of emergency stocks.

- Reinforce food safety, including handwashing stations in public places (such as marketplaces, street vendors) and at gatherings such as funerals.

Safe and dignified burial practices

- Before the cholera season, prepare a simple list of the main recommendations for healthcare workers to safely prepare corpses for burial.
- Train appropriate community members for safe and dignified burials.
- If possible, investigate local funeral practices to identify any that may transmit cholera, and identify alternative practices.

Vaccination with OCV

- Ensure all procedures for vaccination importation, such as registration, are completed for OCV.
- Inform decision-makers and health staff on OCV, including how to access it and how to conduct a campaign.
- Develop tools for a vaccination campaign such as model tally sheets and communication messages for the use of OCV to prepare for its use in the event of an outbreak or humanitarian crisis.

Long-term interventions

- In many countries, cholera occurs seasonally and in limited areas (hotspots). Comprehensive and multisectoral interventions targeted at these hotspots should lead to long-term control and even elimination of cholera.
- Long-term measures to control cholera and other diarrhoeal diseases should focus on sustainable improvements in water supply, sanitation, food safety and community awareness of preventive measures.
- Cholera-endemic countries or countries experiencing recurrent cholera outbreaks should consider cholera as a high-priority public health problem and develop and implement NCPs.

- NCPs should include a multidisciplinary approach to ensure that long-term interventions are complementary and implemented in synergy.
- Interventions should target identified cholera hotspots throughout the country and should focus on:
 - WaSH – implementation of adapted, long-term, sustainable WaSH solutions for the population most at risk of cholera;
 - surveillance and reporting – effective routine surveillance and laboratory capacity at peripheral levels to confirm suspected cases, inform the response and track progress towards elimination;
 - healthcare system strengthening – enhanced readiness for cholera outbreaks through capacity-building for staff, pre-positioning of resources and supplies for diagnosis, patient care and emergency WaSH interventions;
 - use of OCV – large-scale vaccination to immediately reduce disease burden while long-term cholera control measures are put in place;
 - community engagement – enhanced communication on cholera control strategies, hygiene promotion, cholera risks and accessing treatment by mobilizing community leaders; and
 - leadership and coordination – intersectoral coordination and building of a strong preparedness and response strategy.

Additional resources

1. Cholera outbreak: assessing the outbreak response and improving preparedness. Global Task Force on Cholera Control. 2010
<https://www.who.int/cholera/publications/OutbreakAssessment/en/>
2. Ending Cholera. A Global Roadmap to 2030. Global Task Force on Cholera Control. 2017.
<https://www.who.int/cholera/publications/global-roadmap/en/>

Appendices Table of Contents

Appendix 1. Definitions	89
Appendix 2. Field investigation and initial response checklist	91
Appendix 3. District-level supply forecasting tool	97
Appendix 4. Matrix for coordination of cholera control activities	99
Appendix 5. Template of a cholera line list	101
Appendix 6. Weekly community-based surveillance form	103
Appendix 7. Outline of the outbreak situation report	105
Appendix 8. Key messages for health education	109
Appendix 9. Chlorine solutions according to use	113
Appendix 10. CTU/CTC evaluation form	115
Appendix 11. Flow chart for cholera case management	117
Appendix 12. Admission and triage form	118
Appendix 13. Methods for household water treatment	120
Appendix 14. Preparation and use of 1% chlorine solution to disinfect water	123
Appendix 15. Rules for safe preparation of food to prevent cholera	127

Appendix 1. Definitions

Acute watery diarrhoea (AWD)

Acute watery diarrhoea is an illness characterized by three or more loose or watery (non-bloody) stools within a 24-hour period.

Suspected cholera case

In areas where a cholera outbreak has not yet been declared, any person 2 years of age or older presenting with acute watery diarrhoea and severe dehydration or dying from acute watery diarrhoea.

In areas where a cholera outbreak has been declared, any person presenting with or dying from acute watery diarrhoea.

Confirmed cholera case

A suspected case with *V. cholerae* O1 or O139 confirmed by culture or polymerase chain reaction (PCR). In countries where cholera was never known to be present, or has been eliminated, the *V. cholerae* O1 or O139 strain is demonstrated to be toxigenic.

Cholera alert

A cholera alert (suspected cholera outbreak) is defined by the detection of at least one of the following:

- a) two or more people aged 2 years or older with acute watery diarrhoea and severe dehydration, or dying from acute watery diarrhoea, from the same area within 1 week of one another;
- b) one death from severe acute watery diarrhoea in a person aged 5 years or older;
- c) one case of acute watery diarrhoea testing positive for cholera by rapid diagnostic test (RDT) in an area (including areas at risk for extension from a current outbreak) that has not yet detected a confirmed case of cholera.

Cholera outbreak

A cholera outbreak is defined by the occurrence of at least one confirmed case of cholera and evidence of local transmission.

In areas with sustained (year-round) transmission, a cholera outbreak is defined as an unexpected increase (in magnitude or timing) of suspected cases, over 2 consecutive weeks, of which some are laboratory confirmed.

Cholera-endemic area

An area where confirmed cholera cases, resulting from local transmission, have been detected in the last 3 years. An area can be defined as any subnational administrative unit including state, district or smaller localities.

Any country that contains one or more subnational administrative units that are endemic, as defined above, is considered a cholera-endemic country.

Cholera hotspot

A geographically limited area (such as a city, administrative level 2 or health district catchment area) where environmental, cultural and/or socioeconomic conditions facilitate the transmission of the disease and where cholera persists or reappears regularly. Hotspots play a central role in the spread of the disease to other areas.

Appendix 2. Field investigation and initial response checklist

Prior to departure

1. Verify the source of the alert.

- Verify that the information is from a reliable source and reflects conditions suggesting a true outbreak.

2. Obtain the required authorizations.

- In addition to official authorizations, make sure to include permission from local leaders or persons of influence in the community.

3. Prepare materials and supplies for surveillance and to collect and transport specimens.

- Standard line lists or registers, case definitions and procedures for surveillance;
- Materials for handwashing (water, soap and bleach to disinfect water), gloves, boxes for collection and disposal of contaminated supplies and equipment; and
- Rapid diagnostic tests (RDTs) and materials for specimen collection and transport: stool containers, rectal swabs and Cary-Blair transport medium.

4. Prepare supplies for patient care, infection prevention and control (IPC) and health and hygiene education.

- Copies of treatment protocols, oral rehydration solution (ORS), chlorine for water treatment, medical supplies (such as Ringer's lactate, giving sets, IV cannulas), soap;
- Information, education and communication (IEC) materials and body bags.

5. Arrange transport, security and other logistics.

- Organize transport under secure conditions for the team and supplies.
- Organize transport of specimens to the reference laboratory.

In the field

6. Review the registers at the health facilities.

- Check the register, if available, or speak to clinicians about any previous cases.
- Collect data from the register, including numbers of patients and deaths from suspected cholera per age category (under 5 years of age and 5 years of age and older) per week.
- Try to collect data from at least 1 month prior to the first suspected cases to identify when the number of cases increased.
- Collect data on where patients live when available.
- Provide data collection tools (register, line list) and training in case definition, data collection and reporting.

7. Examine patients and review clinical management.

- Assess the clinical presentation of the cases.
- Review current case management practices and protocols.
- Ensure adequate patient flow and adapt as necessary, anticipating arrival of additional patients if appropriate.
- If the CFR is greater than 1%, conduct an assessment of the health facility to identify gaps and priority actions to ensure appropriate access and treatment.
- Provide protocols and job aids, training and medical supplies as needed.

8. Collect laboratory specimens to confirm the diagnosis.

- Collect faecal specimens (liquid stool or rectal swabs) from suspected patients.
- If RDTs are available, prioritize sending specimens from RDT-positive samples to the laboratory for confirmation.
- Send stool samples to the laboratory following standard procedures.
- Verify that health-care workers can safely collect, store and transport samples.
- Provide training in sample collection, storage and transport and provide job aids and supplies, if needed.
- Collect faecal specimens (liquid stool or rectal swabs) from suspected patients and send them to the laboratory for confirmation under appropriate conditions. See section 2 – outbreak confirmation.
- If RDTs are available, prioritize sending specimens from RDT-positive samples to the laboratory for confirmation.
- Verify that health-care workers can safely collect, store and transport samples.
- Provide training in sample collection, storage and transport and provide job aids and supplies if needed.

9. Review water, sanitation and hygiene (WaSH) and IPC measures at the health facility.

- Evaluate water supply and sanitation facilities and IPC measures and reinforce good practices, as appropriate.
- Ensure there is enough water to cover the daily needs of patients and caregivers and adequate measures for the safe disposal of excreta and vomit.
- Ensure that handwashing facilities and chlorine solutions for disinfection are available. As needed, provide protocols, training and supplies (such as buckets, clothes, soap, alcohol-based hand rubs, chlorine, cleaning materials, and personal protective equipment such as gloves, waste bins and cholera cots).

10. Conduct a community WaSH investigation.

- Investigate the possible sources of contamination and likely modes of transmission (such as water sources, markets, gatherings, funerals and cultural practices).
- If possible, test for free residual chlorine (FRC) in water that is expected to be chlorinated and test for faecal contamination in other water sources. Chlorinate these sources if FRC levels are low.
- Engage with the community through health and hygiene promotion, using IEC materials to deliver cholera prevention messages and to promote early treatment for diarrhoea.

11. Conduct active case finding, social mobilization and community engagement.

- Actively search in the community for additional cases with similar symptoms and refer to the health facility for treatment.
- Train community health workers in case definition, data collection and reporting. Community health workers can also carry out active case finding.
- Assess the knowledge of the community on cholera prevention and control measures. Deliver key messages to the community to prevent cholera.
- Deliver ORS, soap for handwashing and products for water treatment.
- As with community WaSH investigations, engage with family and neighbours of sick people through health and hygiene promotion, using IEC materials to deliver cholera prevention messages and promote early treatment for diarrhoea.

12. Conduct household visits and interviews

- Interview sick people and their relatives to identify water sources and potential risk exposures. If possible, test chlorinated drinking water sources for FRC and other drinking water sources for faecal contamination. Chlorinate these sources if FRC levels are low.

- Provide prevention messages to the family members.
- Deliver soap for handwashing and products for household water treatment.

13. Conduct risk and needs assessments.

- Conduct a risk assessment to evaluate the risk of spreading and the impact of the disease.
- Conduct a needs assessment to identify the available resources (human and supplies) and list the additional necessary resources.

After the field visit

14. Debrief with appropriate authorities, summarize main findings and provide recommendations.

- Describe cases and laboratory findings.
- Define areas and populations affected and at risk.
- Identify possible causes of the outbreak and the potential mode(s) of transmission.
- Describe the preventive and control measures already implemented.
- Identify the resources needed for responding to the outbreak.
- Provide specific recommendations and actions to be implemented.

15. Report the findings of outbreak investigation.

- Prepare an outbreak investigation report.
- Disseminate the report among appropriate authorities and partners.

Appendix 3. District level supply forecasting tool

The below is a description of elements included in the tool.

The full Excel-based, modifiable tool can be found at: www.gtfcc.org

This tool is designed to help teams estimate basic supply needs at a district level.

For each district, teams input the following elements:

- Population
- Cases and deaths reported to date
- Estimated final attack rate

The tool provides the following outputs per district and overall:

- Estimated cases to the end of the outbreak (excluding those already reported)
- Estimated needs
 - Sachets of ORS
 - Litres of Ringer's Lactate
 - 100 mg tablets of doxycycline
 - 10 mg tablets of zinc
 - Number of beds during peak

For those ordering via UN procurement, a tool to help guide ordering of the WHO cholera kits is available here: <https://www.who.int/cholera/kit/en/>

Appendix 4. Matrix for coordination of cholera control activities

This appendix can be downloaded from the GTFCC website www.gtfcc.org

Matrix for coordination of cholera control activities

Indicate the activities conducted by each partner/NGO

Activities	Partner/NGO:	Partner/NGO:
	Name of the person: Tel: District:	Name of the person: Tel: District:
Case management Oral rehydration Points Out-patient clinics Cholera treatment facilities ORS provision Active case finding Transport of patients Other:		
Laboratory Confirmation by culture or PCR Antibiotic resistance testing Provision of reagents Other:		
WaSH Household chlorination Hygiene education Provision of safe water Provision of chlorine, soap, etc... Latrine maintenance Food safety in markets, street food vendors Hygiene education IPC in health facilities Other:		
Surveillance Outbreak investigation Collection, reporting and data analysis Reports and dissemination Other:		
Health education In community In camps Other:		
Funeral practices Collection of corpses Preparation of corpses Monitoring of funerals Other activities		
Other activities Vaccination Training Supervision Other:		

Appendix 5. List of elements to be included in a cholera line list

A downloadable excel version of this document is available from the GTFCC website www.gtfcc.org

Elements to be included:

- Name of the treatment facility
- ID number
- Name
- Age - in years
- Place of residence - house, street, neighborhood, village, section of camp
- Sex - M/F
- Date of consultation – dd/mm/yyyy
- Date of onset of symptoms – dd/mm/yyyy
- Dehydration status/Treatment plan – No signs of dehydration (Plan A), some signs of dehydration (Plan B), severe dehydration (Plan C)
- Hospitalization – Admitted/Outpatient
- Outcome – Recovered, died at CTC, died in the community, referred, self-discharged, unknown
- Date of outcome – dd/mm/yyyy
- Stool sample taken – Yes/No
- RDT – Positive/negative/not performed, unknown
- Lab results – Culture +/-, PCR +/-, not performed, unknown
- Vaccination status (OCV) – Vaccinated, unvaccinated, unknown

Appendix 6. Weekly community-based surveillance form

This appendix can be downloaded from the GTFCC website www.gtfcc.org

Province/district _____ Community/Village _____
 Name of community health worker _____ Telephone number _____
 Reporting week _____

Day	# new cases		Total # new cases	Deaths		Total deaths	Number of cases referred to CTU/CTC	Comments
	<5	≥5		<5	≥5			
Day 1								
Day 2								
Day 3								
Day 4								
Day 5								
Day 6								
Day 7								
Total								

Appendix 7. Outline of the outbreak situation report

Title (including place, country name and type of disease outbreak):

Situation report number:

Date (including epidemiological week):

Executive summary or highlights

Brief description of the main findings, outbreak response activities (case management, water, sanitation and hygiene, surveillance, coordination and logistics), conclusions and recommendations for the period covered by the report.

Background

- Description of the alert
- Outbreak confirmation of first cases
- Current areas affected and population at risk
- First response activities

Situation update

a) Epidemiology (figures, tables and maps)

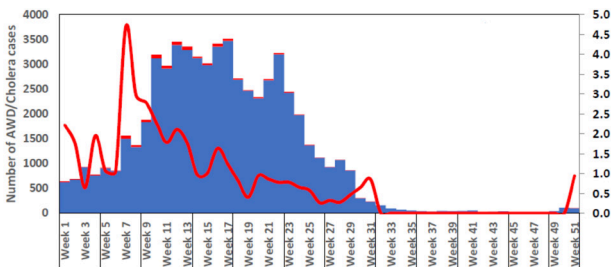
- Number of new and cumulative number of suspected cholera cases and deaths by week and by administrative area

Epi week	District	Date of onset of outbreak	New cases on current week	New deaths on current week	Cumulative suspected cases	Cumulative deaths
1	District 1	dd/mm/yyyy				
1	District 2	dd/mm/yyyy				
1	District 3	dd/mm/yyyy				
1	District 4	dd/mm/yyyy				
	Total Cases					

- Number of confirmed cases per week and per administrative area – example:

Epi week	District	CTU/CTC	Samples sent on current week	Culture/PCR positive	Culture/PCR negative	Samples tested
1	District 1	CTU/CTC A				
1	District 2	CTU/CTC B				
1	District 3	CTU/CTC C				
1	District 4	CTU/CTC D				
1	District 5	CTU/CTC E				

- Graph of number of cases and deaths over time (epidemic curve) with case fatality rate (CFR) line (in all districts combined and by each district/administrative area):



- Map showing the distribution of cases by geographical locations
- Other tables or graphs:
 - AR (overall and by affected area)
 - New alerts and investigations conducted
 - CFR (overall and by affected area)
 - Weekly incidence rate (overall and by affected area)

b) Case management activities

- Number of CTU/CTC and oral rehydration points (ORPs) established and operational
- Capacity of CTU/CTC (number of beds, number of health staff)
- Mapping of CTU/CTC and ORP where possible

c) Community activities, by area (such as provision of safe water, health and hygiene education):

- Assessment conducted in the reporting period
- Mapping of the interventions
- Estimated coverage (%) of programmes in targeted populations

d) OCV conducted or planned

e) Coordination and leadership of the response

- Partners involved (NGO, international agencies, etc.)
- Deployment of experts and international staff

f) Logistics and supplies

- Mobilization of supplies/logistics

g) Constraints, challenges, priority needs

h) Contact information

- Name, email and telephone

Appendix 8. Key messages for health education

What is cholera?

- Cholera is a diarrhoeal illness caused by a bacterial infection in the intestine.
- Cholera causes severe watery diarrhoea and may cause vomiting.
- Cholera can cause death from dehydration (the loss of water and salts from the body) within hours if not treated.

How is cholera spread?

- Cholera bacteria are present in the faeces of infected people.
- Cholera is not likely to spread directly from one person to another. However, household contacts of cholera cases and persons living in proximity of a confirmed cholera case are at higher risk of disease.

How to protect yourself, your family and your community from cholera

a) Personal hygiene and sanitation

- Wash your hands with soap, ashes or lime and safe water:
 - before cooking
 - before eating and before feeding your children
 - after using the latrine (or cleaning your children after they have used the latrine)
 - after taking care of and/or touching a sick person.
- Wash all parts of your hands – front, back, between the fingers and under the nails.

- Use the latrine to defecate. If latrines are not available, defecate away from a body of water and then bury your faeces. Children's faeces should be disposed of in the same way.
- Keep the latrine clean.

b) Food: cook it, peel it or leave it

- Cook raw food thoroughly.
- Eat cooked food immediately, while it is still warm.
- Cover cooked food and store it carefully in a cool place.
- Reheat cooked food thoroughly before eating.
- Avoid contact between raw food and cooked food.
- Wash hands before preparing, cooking or eating food.
- Wash vegetables thoroughly with soap and safe water before eating.
- Eat fruit and vegetables you have peeled yourself.
- Wash your cutting board especially well with soap and safe water.
- Wash your utensils and dishes with soap and safe water.

c) Safe drinking water

- Collect water from a known safe source (where quality is being monitored on a frequent basis).
- Even if it looks clear, water can contain the bacteria causing cholera.
- Boil water for at least 1 minute or add drops or tablets of chlorine to it before drinking or using it to wash vegetables or food preparation items.
- Keep drinking water in a clean, covered pot or bucket or other container with a small opening and a cover. It should be used within 24 hours of collection.
- Pour the water from the container; do not dip a cup into the container.

- If dipping into the water container cannot be avoided, use a cup or other utensil with a handle to scoop the water.

d) Water sources

- Regularly monitor water quality as per protocol.
- Conduct a water safety assessment with the community to eliminate potential or suspected sources of contamination.
- Do not defecate in or near a source of drinking water (stream, river or water hole).
- Do not wash yourself, your clothes or your pots and utensils in the source of drinking water.
- Cover open wells and seal properly when not in use to avoid contamination.
- Hang the buckets used to collect water when not in use; they must not be left on a dirty surface.
- Keep areas surrounding wells and hand pumps as clean as possible.
- Get rid of refuse and stagnant water around a water source.

What to do if you or your family is ill with diarrhoea

- The biggest danger of cholera is loss of fluid from the body.
- Do not panic, but act quickly.
- The sick person should drink a solution of oral rehydration salts (ORS) made with safe (boiled or chlorinated) water.
- Go immediately to see the community health worker or to the health centre. The sick person should continue to drink ORS while seeking care.
- Encourage continuation of breastfeeding while a child or mother has cholera.

Taking care of sick people

- Wash your hands with soap and safe water after taking care of sick people, touching them or their clothes or bedding, or handling or cleaning up their stools or vomit.
- Do not wash a sick person's bedding or clothing in a water source.
- Avoid direct contact with stools and vomit from a person who is sick with cholera. The fluids should be dumped in the latrine and the carrying vessel carefully cleaned/disinfected.
- Disinfect the sick person's clothing and bedding with a solution of chlorine (0.2%). If chlorine is not available, the sick person's bedding and clothing can be disinfected by stirring for 5 minutes in boiling water and drying in direct sunlight, or by washing with soap and drying thoroughly in direct sunlight.

Appendix 9. Chlorine solutions according to use

Chlorine Solutions According To Use ¹			
	0.05%	0.2%	2%
HTH (70% active chlorine)	0.7 grams in 1 litre of water or half tablespoon in 10 litres of water	3 grams in 1 litre of water or 2 level tablespoons in 10 litres of water	30 grams in 1 litre of water or 2 level tablespoons in 1 litre of water
Sodium hypochlorite (bleach) at 5% active chlorine	10 ml of bleach in 1 litre of water or 1tablespoon in 1 litre of water	40 ml of bleach in 1 litre of water or 4 tablespoons in 1 litre of water	400 ml of bleach in 1 litre of water or 2 cups in 1 litre
Use	Washing hands (when soap and alcohol-based hand rubs [ABHR] are not available), utensils and dishes, personal protective equipment (gloves, apron, goggles, etc.)	Disinfection of all parts of the cholera wards, floors, latrines, kitchen, toilets and shower/bathing units, beds or cots, patients' bedding and linens, clothing, utensils, containers and dishes, waste containers and covers, vehicles used for transporting patients	Disinfection of vomit and stool Disinfecting corpses

Continued on next page

Chlorine Solutions According To Use¹

	0.05%	0.2%	2%
Precautions	Solution must be changed every day and protected from heat and light	Use with gloves Solution must be changed every day and protected from heat and light	Use with gloves Solution must be changed every 2 days and protected from heat and light

Notes:

- One cup is 200ml, one tablespoon is 10ml (or 14-15 g).
- Chlorine can corrode and damage metals. Therefore, it is important to never prepare chlorine solutions in metallic containers (unless they are properly enamelled or painted) or use metallic spoons for measurement or stirring. The recommendation is to use plastic containers for preparation of chlorine solutions and wooden spoons for measurement and stirring.

¹ Source: United Nations Children's Fund. Chlorine Mixing, in Cholera Toolkit, 2013, Annex 8E(C). New York: UNICEF; 2013 (<https://www.unicef.org/cholera/Cholera-Toolkit-2013.pdf>); Médecins Sans Frontières.. Preparation of chlorine solutions for cholera structures, in Cholera Guidelines 2004. MSF; 2004 (<https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/choleraguide.pdf>).

Appendix 10. CTU/CTC evaluation form

Below is a description of elements included in the tool.

The full Excel-based, modifiable tool can be found at: www.gtfcc.org

This tool is designed to support field evaluation of cholera treatment facilities.

The tool is organized by topic with colour coding to highlight priority areas.

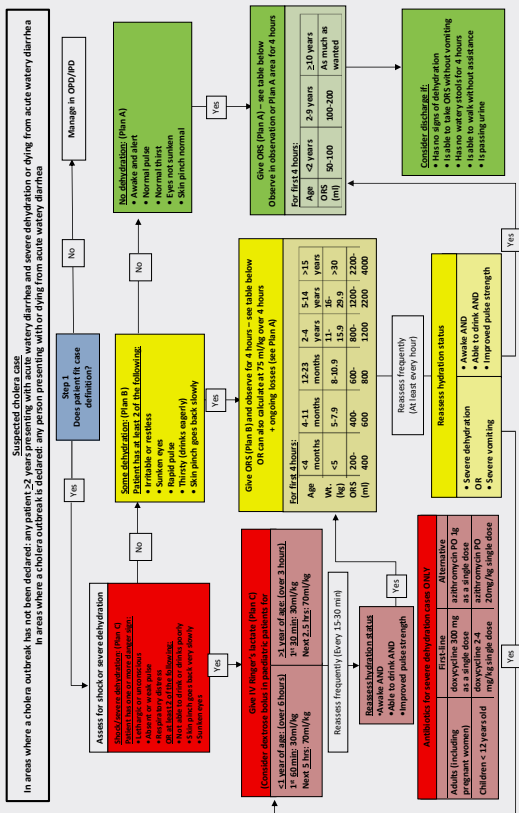
The tool can be shared and used to compare progress from one supervision visit to another.

The structure of the tool is as follows:

- Name of the evaluators
- Description of the treatment facility
- IPC
- Facility layout/organization
- Screening/admissions and observation areas
- Hospitalization area
- Kitchen and meals
- Water
- Latrines and showers
- Waste management
- Dead body management
- Procedures/protocols
- Stocks
- Data management
- IEC and community services
- Recommendations from the visit for improvements
- Recommendations for immediate improvement

Appendix 11. Flow chart for cholera case management

Treatment Flowchart for Cholera Cases



Appendix 12. Admission and triage form

This appendix can be downloaded from the GTFCC website www.gtfcc.org

1. IDENTIFICATION

Patient name _____ Admission date: ____/____/____ Time: ____:____
 Age: ____ years/months Sex: Male Female if female, any possibility of pregnancy? No Yes
 OCV received: No Yes Don't know if yes, when? ____/____/____
 Address: _____ Closest landmark: _____

2. CLINICAL DATA - Please circle if the patient has any of the following and give the length of time in days
 Watery stool x ____ days Fever x ____ days Bloody stool x ____ days
 Vomiting x ____ days When was the last time the patient vomit? ____ hours ago
 When did the illness start? ____/____/____ When was the last time the patient urinated? ____ hours ago
 Any known contacts with anyone else with similar symptoms? No Yes Who? _____
 Please list any other symptoms: _____

3. PHYSICAL EXAM AND DIAGNOSIS

Danger signs	<input type="checkbox"/> Lethargic or unconscious <input type="checkbox"/> Absent or weak pulse <input type="checkbox"/> Respiratory distress	<input type="checkbox"/> No danger signs	
Signs	<input type="checkbox"/> Not able to drink or drinks poorly <input type="checkbox"/> Sunken eyes <input type="checkbox"/> Skin pinch goes back slowly	<input type="checkbox"/> Irritable or restless <input type="checkbox"/> Sunken eyes <input type="checkbox"/> Rapid pulse <input type="checkbox"/> Thirsty, drinks eagerly <input type="checkbox"/> Skin pinch goes back slowly	<input type="checkbox"/> Awake and alert <input type="checkbox"/> Normal pulse <input type="checkbox"/> Normal thirst <input type="checkbox"/> Eyes not sunken <input type="checkbox"/> Skin pinch normal
Treatment Plan	If one or more danger signs OR ≥ 2 above are checked \rightarrow Severe dehydration (Plan C)	If no danger signs AND ≥ 2 above are checked \rightarrow Some dehydration (Plan B)	No dehydration (Plan A)

4. TREATMENT

	Severe dehydration (Plan C)	Some dehydration (Plan B)	No dehydration (Plan A)								
Treatment	<ul style="list-style-type: none"> <input type="checkbox"/> IV fluids: Ringer's lactate bolus <input type="checkbox"/> <1 yr: 30ml/kg in 60 min <input type="checkbox"/> ≥1 yr: 30ml/kg in 30 min Quantity: _____ml over _____min <input type="checkbox"/> Reassess after bolus If absent/weak pulse → repeat bolus Quantity: _____ml over _____min <input type="checkbox"/> IV fluids: Ringer's Lactate bolus <input type="checkbox"/> <1 year: 70ml/kg in 5 hours <input type="checkbox"/> ≥1 year: 70ml/kg in 2.5 hours Quantity: _____ml over _____hours <input type="checkbox"/> Reassess hydration after IV fluids -Severe: Repeat IV fluids -Some: ORS (see 'Some' box) <input type="checkbox"/> Give antibiotics Drug & dose _____ 	<ul style="list-style-type: none"> <input type="checkbox"/> ORS 75ml/kg over 4 hours Quantity: _____ml over 4 hours <input type="checkbox"/> Zinc supplementation (20mg/day) in children 6 months – 5 years <input type="checkbox"/> Reassess after ORS -Severe: Give IV fluids -Some: Repeat ORS amount -No dehydration: Discharge with ORS 	<ul style="list-style-type: none"> <input type="checkbox"/> After each loose stool, give: <table border="1" style="margin-left: 20px;"> <tr> <td>Age (in yrs)</td> <td><2</td> <td>2-9</td> <td>≥10</td> </tr> <tr> <td>ORS (ml)</td> <td>50-</td> <td>100-</td> <td>As much as wanted</td> </tr> </table> <input type="checkbox"/> Zinc supplementation (20mg/day) in children 6 months – 5 years 	Age (in yrs)	<2	2-9	≥10	ORS (ml)	50-	100-	As much as wanted
Age (in yrs)	<2	2-9	≥10								
ORS (ml)	50-	100-	As much as wanted								
Discharge instructions		<ul style="list-style-type: none"> Consider discharge if: <ul style="list-style-type: none"> - Has no signs of dehydration - Can take ORS without vomiting - No watery stools for 4 hours - Can walk without assistance - Is passing urine - Has been advised when to return to hospital/CTC - Health messaging completed 	<ul style="list-style-type: none"> Before discharge, check following: <ul style="list-style-type: none"> <input type="checkbox"/> Health messaging completed <input type="checkbox"/> ORS given for home <input type="checkbox"/> Assure caregiver can correctly mix and give ORS without supervision 								

1. LABORATORY DATA:

Stool sample taken? No Yes Date taken: ____/____/____ Cholera RDT result: +ve -ve Not conducted

Stool culture sent: No Yes Date stool culture sent: ____/____/____

2. OUTCOME:

Date of outcome: ____/____/____ Discharged Dead Self-discharged Referred (where: _____) Unknown

Name of admitting clinician _____ Signature: _____ Date: ____/____/____

Appendix 13. Methods for household water treatment

	Thermal treatment (Boiling)	Chemical disinfection with free chlorine	Chemical coagulation–filtration and chlorine disinfection
Disinfectant residual	No	Yes	Yes
Chemical changes in water	No	Yes, may cause taste and odour	Yes, may cause taste and odour
Microbial regrowth potential in treated water	Yes, with storage beyond 1–2 days	No, if chlorine residual is monitored and maintained	No, if chlorine residual is monitored and maintained
Skills level and ease of use	Low skills, easy to use	Low skills, easy to use with training	Moderate training needed
Availability of needed material	Requires a source of fuel	Requires source of free chlorine, regular monitoring of chlorine residual and safe storage vessels (See Appendix 14)	Requires chemical coagulants, free chlorine, two containers, a filter cloth
Acceptability	High	High to moderate	High to moderate
Length of treatment time	Minutes to tens of minutes	30 minutes	30 minutes
Comments	High cost (fuel)	Not effective against <i>Giardia</i> and <i>Cryptosporidium</i> oocysts	Combined treatment with coagulant and disinfectant effect

Notes

- Effective dosage of chlorine may be affected by the parameters of the water to be treated (temperature recommended FRC levels than low-turbid water).
- Recommendations are to dose with free chlorine at about 2 mg/L to clear water (< 10 nephelometric turbidity units) for at least 30 minutes. However, even low-turbid water can have high chlorine demand due to the total chlorine requirements. Regular testing of FRC and dose adjustment of free chlorine is therefore essential.
- In high-turbid waters, additional treatment may be needed (filtration, sedimentation, coagulation or flocculation).

Sources: World Health Organization. Guidelines for drinking-water quality. Fourth edition. Geneva: WHO;2011. World Health Organization. WHO International Scheme to Evaluate Household Water Treatment Technologies. [round-1/en/](http://www.who.int/water_sanitation_health/ehwt/round-1/en/)

OXFAM. Technical Brief – Household water treatment and Storage. 2007 (<https://supplycentre.oxfam.org.uk/>)

Solar disinfection with UV + heat (SODIS system)	UV disinfection with lamps	Membrane, porous ceramic or composite filters	Granular media filters Slow sand filters
No	No	No	No
No	No	No	No
Yes, with storage beyond 1–2 days	Yes, with storage beyond 1–2 days	Yes, but container provides safe storage	Yes, but container provides safe storage
Low skills, easy to use	Moderate training needed	Low skills, easy to use with training	Low skills, easy to use with training
Requires plastic bottle and dark surface	Requires UV radiation units, replacement lamps, and reliable source of electricity	Requires a filter, regular cleaning and maintenance	Requires a sand filter, regular cleaning and maintenance
High to moderate	Moderate to low	Moderate to low	Moderate to low
6–12 hours (full sun) to days (if cloudy)	Seconds to minutes, depending on the water volume treated and the reactor design	Depending on the filter 1–3 litres/hour	1 litre per minute
Suitable in areas with high sunlight exposure	Ineffective in turbid-waters. Considerable maintenance and high cost	Depends on the pore size and use of silver or other chemical agents	Considerable maintenance and high cost

re, pH, turbidity and total organic carbon). High-turbid water will require more free chlorine to reach the turbidity units) and twice that (4 mg/L) to turbid water (> 10 nephelometric turbidity units), with a contact time organic carbon load that is not detected by nephelometric testing. Temperature and pH may also affect chlorination) to remove suspended particles and reduce turbidity.

17 (http://www.who.int/water_sanitation_health/publications/2011/dwq_guidelines/en/)
 ies. Geneva: WHO; 2016 (http://www.who.int/household_water/scheme/household-water-treatment-report-water-treatment-11-c.asp)

Appendix 14. Preparation and use of 1% chlorine solution to disinfect water

Preparation of 1% chlorine stock solution²

To make 1 litre of the stock solution, mix the quantity shown of one of the following chemical sources with water and make up to 1 litre in a glass, plastic or wooden container.

Product	1% chlorine stock solution	Notes
HTH At 70% active chlorine	15 grams in 1 litre of water or 1 level tablespoon in 1 litre of water	Loses about 2% of active chlorine per year The quantity of HTH (70% active chlorine) necessary for all needs is approximately 100–110 g per patient per day
NaDCC At 1g active chlorine per tablet	10 tablets in 1 litre of water	The most stable product
Chlorinated lime At 30% active chlorine	33 grams in 1 litre of water or 2 level tablespoons in 1 litre	Unstable and should be used within 3 months of manufacture (if stored in good conditions)
Sodium hypochlorite (bleach) At 5% active chlorine	250 ml of bleach in 1 litre of water or 1 glass in 1 litre of water	
Sodium hypochlorite concentrate At 15% active chlorine	70 ml of concentrate in 1 litre of water	

Notes:

- 1 tablespoon = 10 ml or 15 g; 1 glass = 250 ml
- A 1% solution contains 10 g of chlorine per litre = 10 000 mg/litre or 10 000 ppm (parts per million).
- Avoid skin contact with any of the chemical sources or the stock solution, and avoid inhaling chlorine fumes.
- Never prepare chlorine solutions in metallic containers (unless they are properly enamelled or painted) or use metallic spoons for measurement or stirring. The recommendation is to use plastic containers for preparation of chlorine solutions and wooden spoons for measurement and stirring.
- This stock solution should be made fresh every day and protected from heat and light.

Disinfecting water using a 1% chlorine stock solution³

To produce an initial chlorine concentration sufficient to leave a free residual chlorine (FRC) concentration: 0.2–0.5 mg/litre for water at point of use and 1 mg/litre for water at source.

- 1) **Prepare a 1% chlorine solution** as indicated above.
- 2) **Take four non-metallic water containers** (such as 20-litre plastic buckets) and put 10 litres of the water each one.
- 3) **Using a syringe, add progressively greater doses of 1% chlorine stock solution to the containers:**
 - 1st container: 1 ml
 - 2nd container: 1.5 ml
 - 3rd container: 2 ml
 - 4th container: 5 ml

- 4) **Stir the solution** in the containers and wait at least 30 minutes (wait 60 minutes below 10°C as soon as possible and then cover and store them in a refrigerator or icebox if pH is > 8).
- 5) **Measure the FRC** of each container using a comparator or test strip. Choose the container that shows an FRC between 0.2–0.5 mg/litre. This is the required concentration of chlorine for the disinfection of water at point of use. For chlorination of water at source, recommended FRC is 1 mg/litre.
- 6) **If no container has the right FRC**, repeat the exercise with different quantities in step 3 (that is, 2, 4, 8 and 16 ml).
- 7) **Calculate the amount** of 1% chlorine solution needed for the quantity of water to be treated. Test the chlorine levels of the containers regularly to ensure adequate levels of FRC.

² United Nations Children's Fund. Chlorine Mixing, in *Cholera Toolkit*, 2013, Annex 8E(C), p. 217. New York: UNICEF; 2013 (<https://www.unicef.org/cholera/Cholera-Toolkit-2013.pdf>); and Médecins Sans Frontières. Preparation of chlorine solutions for cholera structures, in *Cholera Guidelines 2004*, p. 113. MSF; 2004 (<https://www.humanitarianresponse.info/sites/www.humanitarianresponse.info/files/documents/files/choleraguide.pdf>).

³ Source: Delmas, G., Courvallet, M. (1994). *Public Health Engineering in Emergency Situation*, WHO.

Appendix 15. Rules for safe preparation of food to prevent cholera

1. Cook (raw) foods thoroughly

Fish, shellfish, and vegetables are often contaminated with cholera bacteria. Therefore, heat all the parts of the food to at least 70°C. Do not eat uncooked foods unless they can be peeled or shelled.

2. Eat cooked foods immediately

When there is a delay between cooking and eating food, as when food is sold in restaurants or by street vendors, it should be kept over heat, at 60°C or more, until served.

3. Cover cooked foods and store carefully

If you must prepare foods in advance or want to keep leftovers, be sure to cool them to below 10°C as soon as possible and then cover and store them in a refrigerator or icebox below 10°C. Cooked foods that have been stored must be thoroughly reheated before eating. Foods for infants should be eaten immediately after being prepared, and should not be stored at all.

4. Reheat cooked foods thoroughly

Proper storage at low temperature slows the growth of bacteria but does not kill them. Once again, thorough reheating means all parts of the food must reach at least 70°C. Eat food while it is still hot.

5. Avoid contact between raw and cooked foods

Safely cooked food can become contaminated through even the slightest contact with raw food (directly or indirectly through cutting surfaces or knife blades, for example).

6. Choose foods processed for safety

Canned, acidic and dried foods should be without risk.

7. Wash hands repeatedly

Wash hands thoroughly before preparing food and after every interruption, especially if you have to change or clean a baby or have used the toilet or latrine. After preparing raw foods such as fish or shellfish, wash your hands again before handling other foods.

8. Keep all kitchen surfaces clean

Since foods are so easily contaminated, any surface used for food preparation must be kept absolutely clean. Think of every food scrap, crumb or spot as a potential source of bacteria. Cloths used for washing or drying food, or for preparation of surfaces, dishes and utensils, should be changed every day and boiled before reuse. Separate cloths that are used for cleaning the floors also require daily washing.

9. Use safe water

Safe water is just as important for food preparation as it is for drinking.



GLOBAL TASK FORCE ON
CHOLERA CONTROL