



# Cholera

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## Key facts

To better understand public health terms included in this Disease Tool (e.g., What is a case definition? or What is an infectious agent?), consult our page on [Key concepts on epidemiology](#).

## Importance

Cholera is an acute diarrhoeal disease caused by the infection of the intestine with the bacterium *Vibrio cholera*. Both children and adults can be infected and the disease remains a major public health problem. Acute watery diarrhoea is an illness characterized by three or more loose or watery (non-bloody) stools within a 24-hour period. Each year there are an estimated 1.3 to 4.0 million cases of cholera, including 21,000 to 143,000 deaths globally. Approximately 41 per cent of cases are reported from Africa, 37 per cent from Asia and 21 per cent from the Americas ([data from 2015](#)).

Primary causes include insufficient access to safe drinking water, proper sanitation and hygiene, and this impact can be exacerbated in areas where basic infrastructure is disrupted or has been destroyed. Countries facing complex emergencies and large population movements (of internally displaced persons [IDPs] or refugees) to overcrowded settings are particularly vulnerable to cholera outbreaks.

Most affected countries report an overall cholera case fatality rate (CFR) of greater than two per cent. In some locations the CFR may approach 30–50 per cent in outbreaks where vulnerable groups have limited access to health care.

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## Case definition

A **case definition** is a set of uniform criteria used to define a disease for public health surveillance. It enables public health officials to classify and count cases consistently.

*The following are standard case definitions to allow national health authorities to interpret data in an international context. However, during an outbreak case definition may be adapted to the local context and the Red Cross Red Crescent should use those agreed/established by national health authorities. NB: Consider that during community-based surveillance, **volunteers** should use broad (simplified) case definitions (referred to as community case definitions) to recognize most or all possible cases, provide relevant risk communication and appropriate actions and encourage them to seek care. Other actors such as **healthcare workers or investigators** studying the cause of a disease, on the other hand, can use more specific case definitions that may require laboratory confirmation.*

**Suspected case:**

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

Note: It is important to note that children under two years are still affected by cholera and need to be treated immediately for acute watery diarrhoea and should be included in epidemiological data during outbreaks.

#### **Confirmed case:**

- *Vibrio cholerae* serotype O1 or serotype O139 is isolated (in a laboratory) from any suspected case.

After a cholera outbreak has been identified, assume that all cases of acute watery diarrhoea in the area have cholera, with only periodic laboratory testing to confirm that cholera transmission persists and that the outbreak is ongoing.

WHO case definition source of information [here](#).

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## **Alert / epidemic threshold**

An **alert threshold** is the pre-defined number of alerts that suggest the beginning of a possible disease outbreak and therefore warrant immediate notification.

**Epidemic thresholds** are the minimum number of cases indicating the beginning of a particular disease's outbreak.

Cholera can be endemic, epidemic or pandemic.

A cholera outbreak is defined by the occurrence of at least one confirmed case of cholera, with evidence of local transmission in an area where there is not usually cholera.

In endemic areas, an outbreak is defined as a significant increase in the baseline number of cases of cholera (more cases reported than is expected for that period).

## **Risk factors**

- Water contaminated with human faeces, for example from sewage, septic tanks and latrines, is a source of infection. Animal faeces also contain microorganisms that can cause diarrhoea.
- Inadequate access to clean water and sanitation facilities. Water can also be contaminated during transport, storage and handling.
- Food and water when prepared or stored in unhygienic conditions. Raw fruits and vegetables that are contaminated with faeces and not appropriately washed. Seafood taken from contaminated water and eaten raw or not sufficiently cooked.
- Typical at-risk areas include peri-urban slums, and camps for internally displaced persons or refugees, where minimum requirements of clean water and sanitation are not met.
- The consequences of a humanitarian crisis – such as disruption of water and sanitation systems, or the displacement of populations to inadequate and overcrowded camps – can increase the risk of

cholera transmission, should the bacteria be present or introduced.

- Oral Rehydration Points (ORPs) or cholera treatment facilities where Infection Prevention and Control (IPC) methods are not appropriately implemented and/or followed.
- Bodies of people who have died from cholera. This includes burial ceremonies where corpses are touched, or food is shared. Uninfected dead bodies have never been reported as the source of epidemics.
- Household members and close neighbours of cholera patients are at increased risk in the days immediately following the person's illness.

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## Attack rate (AR)

The **attack rate** is the risk of getting a disease during a specific time period (such as during an outbreak).

***Attack rates will vary from one outbreak to another. In case of an outbreak, consult the latest information provided by health authorities.***

According to the Global Task Force on Cholera Control:

- In rural communities with low population density, the AR might vary (0.1–2 per cent)
- In crowded places (such as urban settings, refugee camps), the AR tends to be higher (1–5 per cent).
- In settings with no immunity and poor water and sanitation conditions, AR can exceed 5 per cent.

## Groups at increased risk of severe illness (most vulnerable)

- Malnourished individuals are more vulnerable to severe cholera diseases, particularly young children. Each cholera and diarrhoeal episode, in turn, makes their malnutrition even worse.
- Individuals with chronic medical conditions (HIV infection, cancer, chronic renal, liver or lung diseases, diabetes, etc.).
- Individuals without ready access to rehydration therapy and medical services.
- Individuals with achlorhydria (the absence of hydrochloric acid in digestive stomach juices), for example because of the use of antacids, histamine receptor blockers and proton pump inhibitors.
- Individuals with blood type O.

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## Infectious agent

**Infectious agents** are bacteria, viruses, fungi, prions and parasites. A disease caused by an infectious agent or its toxic products is defined as an infectious disease.

*Vibrio cholerae* bacterium: there are two serogroups – O1 and O139. The clinical and epidemiologic features of both serogroups are very close.

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## Reservoir / host

A **reservoir of infection** is a living organism or material in or on which an infectious agent lives and/or usually multiplies. Reservoirs include humans, animals and the environment.

A **susceptible host** is a person at risk of being infected. The level of susceptibility depends on age, sex, ethnicity and genetic factors, specific immunity also depends on other factors that affect an individual's ability to resist infection or to limit its ability to cause infection.

A **zoonotic disease** or **zoonosis** is an infectious disease that has jumped from a non-human animal to humans.

Human host.

Aquatic reservoir.

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## How disease is spread (modes of transmission)

Categorisation of **modes of transmission** varies from one agency to another. In addition, some infectious agents can be transmitted by more than one mode. A list of modes of transmission can be found in the key concepts to serve as guidance to better understand the diseases included in this website.

**Faecal oral transmission:** Water contaminated with human faeces (from someone who has cholera) is the main mode of transmission. Ingestion of contaminated food and water that have been handled by a person who is shedding *Vibrio cholerae* through the faeces, or if sewage contaminated with *V. cholerae* bacteria gets into the water used for drinking or washing food are the main modes of transmission. Contaminated hands, utensils, water or insects can mechanically transfer the organism to food, where the bacteria then multiply to achieve an infective dose. Care should also be taken when handling the bodies of those who have died due to cholera, ensuring strict disinfection and IPC measures. The disease is not likely to spread directly from one person to another by casual contact, and neither is it transmitted through animals.

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## Incubation period

This time from when infection occurs to the onset of symptoms is called the **incubation period**. It is a range of days and it can be different for each disease.

Two hours to five days.

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## Period of infectiousness

**Period of infectiousness** is the time interval during which an infected person can transmit the infection to other susceptible persons.

- Most people infected with *Vibrio cholerae* do not develop any symptoms, although the bacteria are present in their faeces for one to ten days after infection and are shed (excreted) back into the environment, potentially infecting other people. This is important when considering interventions aimed at stopping transmission via contact tracing alone.

## Clinical signs and symptoms

- 20 per cent of infected people develop symptoms and among them 20 per cent develop severe symptoms. Severe disease is characterized by painless profuse watery diarrhoea, often followed by vomiting, leg and abdominal cramps. In these cases, rapid loss of body fluids leads to dehydration and shock. Without treatment, death can occur within hours. Fever is typically absent.

## Other diseases with similar clinical signs and symptoms

Other infectious diarrhoea, amoebic dysentery, food poisoning.

## Diagnosis

- When a cholera outbreak is suspected and an alert is triggered, collect stool samples from symptomatic individuals for microbiological confirmation by culture and/or polymerase chain reaction (PCR).
- Cholera rapid diagnostic tests (RDTs) are intended to be used at peripheral healthcare levels only for early outbreak detection and not for individual diagnosis or to confirm the cholera outbreak.
- Once the outbreak is declared, RDTs also permit the triage of specimens to be tested at the laboratory. Samples tested positive by RDT should be prioritized for laboratory testing.
- During a cholera outbreak, assume that all cases of acute watery diarrhoea in the area have cholera and periodic laboratory testing is only needed to confirm that transmission persists, and the outbreak is still ongoing.

## Vaccine or treatment

**Please refer to the appropriate local or international guidelines for clinical management. All clinical management including the administration of any treatment or vaccine should be conducted by health professionals.**

Definitive diagnosis is not a prerequisite for the treatment of patients with cholera. The priority in management of any watery diarrhoea is replacing the lost fluid and electrolytes. The case fatality rate in

untreated cases may be 30—50 per cent. However, treatment is straightforward and, if provided rapidly and appropriately, the case fatality rate should remain below one per cent.

- In severe dehydration cases hospitalization is required, including the provision of IV rehydration solutions.
- Oral Rehydration Solution (ORS).
- Zinc supplementation – in children under 12 years.
- Antibiotics according to the national protocol.
- The Oral Cholera Vaccine (OCV) has a 50—60 per cent efficacy in preventing episodes of cholera in the first two years after the primary vaccination schedule (Cochrane review). There have been preventive and emergency cholera OCV vaccinations in various countries.

Cholera treatment can be offered at community level through oral rehydration points or at cholera treatment structures such as cholera treatment units, cholera treatment centres or hospitals.

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## Immunity

There are two types of immunity:

- **Active immunity** results when exposure to an agent triggers the immune system to produce antibodies to that disease.
- **Passive immunity** is provided when a person is given antibodies to a disease rather than producing them through his or her own immune system.

- Previous infection with classical cholera provides protection against subsequent disease lasting between six to ten years. Previous infection with *El Tor Cholera* provides protection against subsequent disease lasting three to six years.
- According to the Global Task Force on Cholera Control, two doses of OCV provide protection against cholera for three years. One dose provides short-term protection (at least six months), which has important implications for outbreak management.

## Which interventions are most effective for prevention and control?

*The following is a list of activities considered for Red Cross Red Crescent volunteers to take part in. It is not an exhaustive list of all prevention and control activities for the specific disease.*

- Communicate risks about the disease or epidemic, not only to share information on prevention and mitigation measures, but also to encourage informed decision-making, positive behaviour change and maintenance of trust in the Red Cross Red Crescent response. This includes the identification of rumours and misinformation around disease - frequent during health emergencies - to manage them appropriately. Volunteers should use the most context-appropriate communication techniques (ranging from social media to face-to-face interactions).
- Rapid risk assessment of cholera cases in health care facilities to understand origins of disease and so where to deploy a Red Cross Red Crescent team; at household level to identify potential sources of contamination and use the findings to break transmission in the home and between homes; and in

community shared spaces to identify potential risk of public water point contamination. See the IFRC [Branch Transmission Intervention Team \(BBIT\) Rapid Assessment Tools](#).

- Community education and engagement activities to encourage the adoption of protective behaviours.
- Access to safe water:
  - For prevention: chlorination; filtration; solar disinfection; boiling.
  - When there are confirmed cholera cases: preparation of one per cent chlorine stock solution. Once prepared, the stock (or “mother”) one per cent solution can be used to disinfect water.
    - Please follow the IFRC guidelines for Household water treatment and safe storage in emergencies: A field manual for Red Cross/Red Crescent personnel and volunteers, available at: <https://watsanmissionassistant.org/water/>
  - Water storage containers should be protected from contamination and kept clean.
  - If water is trucked, chlorination can be done in the water tanker itself. However, truck operators may refuse to allow chlorination within the metal tanker due to potential corrosion of the tanker. Therefore, when chlorination is not possible at the water source, once delivered water should be treated and stored in a clean container.
- Promote breastfeeding (stand-alone for six months and up to two years in addition to age-based food).
- Promote handwashing with soap at critical times (before breastfeeding, after changing napkins, before cooking, before eating, after using toilets). This includes not only communication and community mobilization activities to promote handwashing with soap practices, but also when possible, providing handwashing stations in public spaces (e.g. markets, schools).
  - Please refer to the IFRC WASH guidelines for hygiene promotion in emergency operations, available at: <https://watsanmissionassistant.org/emergency-hygiene/>
- Safe disposal of faeces (promote the use of improved sanitation facilities).
  - Latrines/toilets should be maintained clean. A handwashing device (with soap and water) must be present near the latrines.
  - Where latrines are not in place, faeces should be buried, always at a distance from any body of water.
  - Promote food hygiene:
    - Consume properly cooked food.
    - Wash fruits and vegetables carefully. If possible, it is best that vegetables and fruits are peeled.
    - Plates and utensils must be kept clean and off the ground
    - Food must be always covered and protected from flies.
    - All food preparation surfaces must be cleaned.
- Distribution of essential non-food items (NFIs), including soap and water chlorination tablets (if context-appropriate).
- Set up and run Oral Rehydration Points (ORPs). These should be set up in places where established health facilities are able to receive referrals of complicated cases from ORPs.
- Social mobilization for Oral Cholera vaccination (OCV) campaigns.
- Social mobilization during mass chemoprophylaxis of communities at risk.
- Safe burial. This includes training religious and community leaders on how to keep community members safe during gatherings, with regards to food and personal hygiene practices, and with an emphasis on safe handling of bodies.

### **Which interventions have NO evidence and therefore are NOT recommended?**

- Spraying of humans with chlorine is a practice implemented in past cholera epidemics, but for which there is no evidence as a recognized outbreak control measure. In fact, deliberate exposure of humans to chlorine may lead to detrimental health effects, such as skin, respiratory and eye conditions. Other negative effects may be to create a false sense of security among those sprayed; in some cultures, it may create fear and subsequent resistance not only to spraying but also to other necessary outbreak response activities.

# Epidemic characteristics and RCRC indicators and targets

The first table below includes data that should be gathered from health authorities and relevant non-governmental actors to understand the progress and characteristics of the epidemic in the specific country and area of intervention. The second table includes a list of suggested indicators that can be used for monitoring and evaluating Red Cross Red Crescent activities; wording of indicators may be adapted to specific contexts. Target values for a specific indicator can vary widely from one context to another and therefore managers should define them based on the specific population, area of intervention and programmatic capacity. Exceptionally, some indicators in this website may include target values when these are globally agreed as a standard, e.g. 80 per cent of individuals who slept under an insecticide-treated net (ITN) the previous night—the normative World Health Organization benchmark for universal coverage with ITNs. Indicators have been adapted from sources of information including WHO, UNICEF, UNFPA, and Global Fund, among others.

## Epidemic characteristics and progression

National preparedness plans developed
Weekly incidence
Case fatality rate
Attack rate

## Red Cross and Red Crescent Activities

This is a set of suggested [key performance indicators \(KPIs\) for community-based public health operations in response to cholera or AWD outbreaks](#). KPIs for WASH interventions (e.g., for household level water treatment or water supply interventions) are not included. This document may be best used when drafting DREF requests or Emergency Plans of Action. KPIs are aimed at supporting a more structured approach to monitoring, quality assurance and evaluation. Indicators should be selected depending on: the area that is supported in a given outbreak response; specific-context needs; and available capacity to conduct the corresponding monitoring activities.

### See also:

- Indicators for the Disease Tool: Diarrhoeal diseases
- For Community Engagement and Accountability (CEA) indicators for activities accompanying ECV actions, please refer to: IFRC *CEA toolkit (Tool 7.1: Template CEA log frame, activities, and indicators)*. Available at: <https://www.ifrc.org/document/cea-toolkit>
- For guidance on cholera case management.: Global Task Force on Cholera Control (GTFCC) (2019) *Cholera outbreak response field Manual*. Available at:



<https://www.gtfcc.org/wp-content/uploads/2020/05/gtfcc-cholera-outbreak-response-field-manual.pdf>

- For a step-by-step process to plan and implement effective, context appropriate hygiene promotion, without taking shortcuts or for delivering 'hygiene messages': IFRC WatSan Mission Assistant (2017) *WASH guidelines for hygiene promotion in emergency operations*. Available at: <https://watsanmissionassistant.org/emergency-hygiene/>
- For Community beliefs and fears and psychosocial response during a cholera outbreak in Haiti see: Jérôme Grimaud, Fedia Legagneur (2011) *Community beliefs and fears during a cholera outbreak in Haiti*. Available at: <https://www.interventionjournal.com/sites/default/files/Grimaud & Legagneur.pdf>

## Impact on other sectors

Sector	Link to the disease
<b>WASH</b>	Primary cause of cholera includes insufficient access to safe water, insufficient sanitation, and hygiene practices.
<b>Food security</b>	Food and water contaminated with human waste can transmit <i>Vibrio cholerae</i> as well as sharing eating utensils that are contaminated. To avoid this, it is necessary to peel vegetables and fruits, when possible, cook fish and meat thoroughly or wash food with clean water and clean kitchen utensils.
<b>Nutrition</b>	Malnutrition increases the risk for severe cholera disease. Cholera is more likely to spread in places where malnutrition is common, e.g. displacement sites, areas affected by natural disasters, areas impacted by famine, etc.
<b>Shelter and settlements (including household items)</b>	Functional latrines with appropriate faecal sludge management, handwashing facilities and good waste management are important to decrease transmission risk. Cholera outbreaks are of particular concern in population movement and crowded settings.
<b>Psychosocial support and mental health</b>	Cholera epidemics can have an impact on the mental health of those who either lose loved ones or suffer from the stigma associated with the disease based <u>on the assumption of improper behaviour of those affected by cholera</u> . This can lead to anxiety, fear of isolation, feeling of guilt and adverse effects on social relationships, among others.
<b>Education</b>	When schools do not have clean running water or basic toilets, these can add transmission risks in places where there are outbreaks ongoing. Children may then be at risk of getting the disease if attending classes, or at risk of losing on education if staying at home.
<b>Livelihoods</b>	Illness leads to reduction in productivity as people may not be able to work due to disease. This can lead to a loss of income due to the reduction in work activity and to the diversion of resources to seek medical treatment.

## Resources:

- Ali, M., Nelson, A. R., Lopez, A. L., & Sack, D. A. (2015). Updated global burden of cholera in endemic countries. *PLoS neglected tropical diseases*, 9 (6), e0003832. <https://doi.org/10.1371/journal.pntd.0003832>
- Global Task Force on Cholera Control (2020) *About cholera*. Available at: <https://www.gtfcc.org/about-cholera/>
- Médecins Sans Frontières (MSF) (2018), *Management of a cholera epidemic*. Available at: <https://medicalguidelines.msf.org/viewport/CHOL/english/management-of-a-cholera-epidemic-23444438.html>
- Merten, S., Schaetti, C., Manianga, C. *et al.* (2013) Local perceptions of cholera and anticipated vaccine acceptance in Katanga province, Democratic Republic of Congo. *BMC Public Health* 13, 60. <https://doi.org/10.1186/1471-2458-13-60>
- WHO (2021) *Cholera Fact sheet*. Available at: <https://www.who.int/news-room/fact-sheets/detail/cholera>