



RESPONSE TO CHOLERA OUTBREAKS

Case Area Targeted Interventions and
Community Outbreak Response Teams

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Acknowledgements

Special thanks go to UNICEF NYHQ WASH in Emergencies unit, Laure Anquez, Tiffany King, Ayuko Matsuhashi, Jamal Shah and Timothy Grieves who contributed and supported the development of this guideline.

Thanks also go to all those UNICEF colleagues from Regional and Country Office, who took the time to review and provide valuable inputs, in particular, Pierre-Yves Oger, Joachim Peeters, Julien Graveleau, Aidan Cronin, Kwanayi Meki, Abdoulaye Fall, Nisar Syed, Tomohiko Morita, Chris Cormency, Antonio Marro and Samuel Beaulieu.

We also would like to thank the Centers for Disease Control (CDC), in particular Andrea L. Martinsen and Anu Rajasingham who provided useful comments.

This guidance aligns with the Global Taskforce for Cholera Control (GTFCC) roadmap, we therefore take the opportunity to thank GTFCC/WHO Secretariat colleagues for their feedback.

We also extend our thanks to the editorial and design team, Adam Woolf (copy-editing and proofreading) and Karen Kelleher Carneiro (graphic designer).

This guidelines is published while COVID-19 transmission is still widespread, implying that any cholera response teams need to be fully briefed and appropriately equipped to protect themselves, and that all interventions should be adapted to reduce the risk of Covid-19 transmission according to existing global and national guidelines about frontline health workers safety of interventions.

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Delivery of soap, household water treatment product and ORS to an affected household by a Congolese Red Cross member of UNICEF supported CORT, DRC.

Credit: ©UNICEF DRC/2020.

INTRODUCTION TO CASE-AREA TARGETED INTERVENTIONS (CATI) AND COMMUNITY OUTBREAK RESPONSE TEAMS (CORTs)

Background

In past years, UNICEF has strengthened the use of cholera response teams in various countries (Haiti, Yemen, Zimbabwe, Mozambique, DR Congo).

These teams deliver a Case Area Targeted Interventions (CATI) in affected communities which are effective in contributing to reduce the local transmission of cholera. To introduce the community response to cholera, it is important to first understand the different type of teams used in outbreaks control. This guideline focuses on Community Outbreak Response Teams (CORT) which need to be differentiated from Rapid Response Teams (RRT), a term used in the framework of the Integrated Disease Surveillance Response (IDSR)¹ to describe Ministry of Health led teams intervening at the onset of an outbreak by:

- conducting field investigations to verify and confirm the outbreak
- managing cases through surveillance and reporting
- exploring possible sources of contamination and identifying risk factors, to assess the risk of the spread and the potential impact of the disease on the community.

While the terminology used to describe the different types of response teams set-up at different stages in cholera outbreaks can vary, this operational guideline and toolkit **focuses specifically on the activities provided at household and community level once an outbreak has been confirmed.** These are mainly water, sanitation and hygiene (WASH) control measures aiming to limit the spread of the disease in affected households and in surrounding neighbors, also known as Case-Area Targeted Interventions (CATI). Thus,

a CORT mostly aims to implement a CATI; however, depending on the context, it can also deliver a cases cluster-based² intervention, integrate health-related activities and initiate a wider WASH community response.

Objective and target audience

This operational guideline was developed to support the establishment of CORTs in a country or region affected by cholera. It includes the tools and resources required to facilitate the set-up, implementation, training and capacity-building, data-collection, analysis and reporting, and monitoring and evaluation for these teams. It is intended to be used as a toolkit to support The United Nations Children's Fund (UNICEF) country offices and their partners when responding to cholera outbreaks, and is based on the collective experience of establishing and implementing CORTs in Haiti, Yemen, Zimbabwe, Mozambique, and DRC in support of national and local authorities dealing with cholera outbreaks.

Overview of the model

The primary objective of rapid intervention at the household and community level is to contain the transmission of cholera. The CORTs are established and trained teams, usually made up of three to four people from government partners or non-governmental organizations (NGOs). These teams act as an integral part of a national government's alert and response strategy for cholera. As much as possible they should be led by the national government or built on existing outbreak surveillance and response mechanisms, with support from UNICEF when required. Alternatively, community-based volunteers can be

¹ World Health Organization (WHO) and Centers for Disease Control and Prevention (CDC), *Technical Guidelines for Integrated Disease Surveillance and Response in the African Region*, Brazzaville, Republic of Congo and Atlanta, USA: 1–398, 2010. <www.afro.who.int/sites/default/files/2017-06/IDSR-Technical-Guidelines_Final_2010_0.pdf>

² A cluster-based approach differs from a case-based approach as it aims targeting a small geographical that is reporting a higher number of cases in a given period of time, while the later aims targeting all cases.



Inside an acute diarrhea treatment centre in Haiti.

Credit: ©UNICEF Haiti/2019/Meddeb

trained and equipped to deliver similar response within their community. Such government leadership and complementarity with civil society and local actors allows for a long-term transition when external funding is limited, and when outbreak ends.

CORTs provide targeted interventions around cases' households), mainly WASH-related activities, that specifically address local transmission in households and communities. However, in some settings, they have also included health-related activities, such as oral chemoprophylaxis. The details of the type of interventions implemented by the CORTs, at household and community levels, are given in later sections of this guideline.

Effectiveness of the CORTs

In recent cholera outbreaks, UNICEF has increased the use of mobile

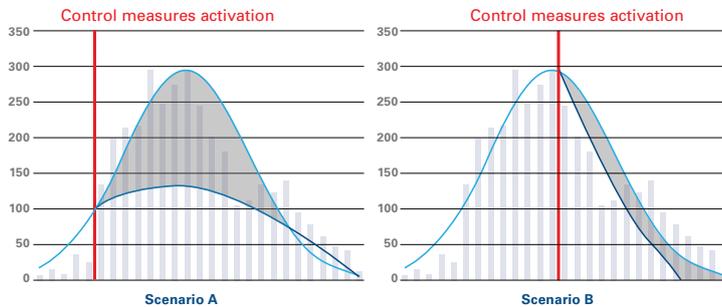
teams in the WASH sector, as part of the response to cholera outbreaks. A Global Review of the various models done by UNICEF in 2019 (see Annex 1) highlighted the added-value of such flexible systems for supporting cholera response and prevention activities in the different countries where it has been used.³

This model provides an integrated and harmonized package that specifically targets cholera infection routes to reduce local transmission from person to person or transitory environmental contamination. Through the systematic use of surveillance systems and available epidemiological data, the CORTs target affected households and at-risk populations in the community. The prompt use of CORTs at the beginning of an outbreak enables early detection and plays a critical role in avoiding further spread of the disease.

³ UNICEF, *Global review of water, sanitation and hygiene (WASH) components in rapid response mechanisms and rapid response teams in cholera outbreak settings – Haiti, Nigeria, South Sudan and Yemen*, UNICEF, New York, 2019.

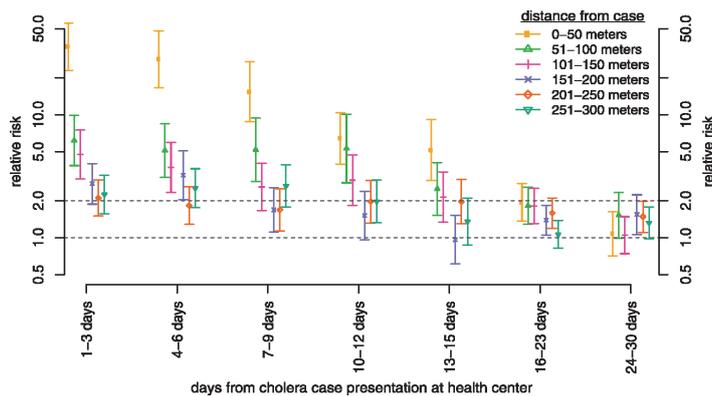
EVIDENCE FOR TIMELY AND TARGETED RESPONSES

Figure 1. Timeliness of response and impact on cholera epidemic curve⁵



Source. Modified from Darcy et al., 2018

Figure 2. Relative risk of cholera transmission



Source. Debes et al., 2016⁷

A series of existing studies and evidence supports the rationale for targeted responses. This is how the CATI model was designed and implemented in outbreak settings in **Haiti, Yemen, Zimbabwe and Mozambique** (see Annexes 2 and 3). Evidence proves that early case detection and treatment act as key control measures in reducing cholera incidence and fatality rates. The early establishment and prompt use of CORTs enables a speedy response so that control measures can stay ahead of the epidemic curve (see Figure 1)⁴.

There is also evidence proving the relationship between the relative risk of cholera transmission and proximity of households with confirmed cases. The relative risk of being infected in the first three days is 36 times higher within a 50-metre radius of a confirmed case, six times higher within a 51–100-metre radius, and five times higher within a 101–150-metre radius (see Figure 2)⁶.

Other studies have also shown that:

- promoting hand-washing with soap, and treatment of water, can achieve significant protection for the household contacts of cholera patients⁸.
- early targeted response interventions are more resource efficient than mass interventions against cholera⁹.

4 Darcy, J. et al., 'UNICEF Yemen 2017 cholera response evaluation' (first draft report) 2018.

5 Schematic representation of the same cholera control measures implemented at the beginning (Scenario A) and after the peak (Scenario B) of an outbreak, and potential cases averted. [Y-axis = incidence of new cases, X-axis = time]. Darcy et al., 2018.

6 Azman, A. et al., 'Micro-Hotspots of Risk in Urban Cholera Epidemics', *Journal of Infectious Diseases*, vol. 218, no. 7, 24 August 2018, pp. 1164–68. <www.biorxiv.org/content/early/2018/01/18/248476.full.pdf+html>

7 Debes, A. K. et al., 'Cholera cases cluster in time and space in Matlab, Bangladesh: Implications for targeted preventive interventions', *International Journal of Epidemiology*, vol. 45, no. 6, 2016, pp. 2134–39. <www.ncbi.nlm.nih.gov/pubmed/27789673>

8 Based on randomized trial in Bangladesh of interventions promoting hand-washing and water treatment (with kit distribution) in families of hospitalized cholera cases (George et al., 'Randomized Controlled Trial of Hospital-Based Hygiene and Water Treatment Intervention (CHoB17) to Reduce Cholera', *Emerg Infect Dis.*, vol. 22, no. 2, February 2016, pp. 233–41).

9 Finger, F. et al., 'The potential impact of case-area targeted interventions in response to cholera outbreaks: A systems study', *PLOS Medicine*, 27 February 2018. <<https://doi.org/10.1371/journal.pmed.1002509>>



Demonstration of oral rehydration solution preparation during a CATI intervention, Haiti.

Credit: ©UNICEF Haiti/2019.

CASE STUDY, HAITI: EFFECTIVENESS OF CATIS

A systematic review to assess the effectiveness of CATIs was conducted over a three-year period from 1 January 2015 to 31 December 2017 in one administrative department of Haiti, comparing the outcome of cholera outbreaks with the promptness of response¹⁰. The study evaluated CATI effectiveness by comparing the number of cases from the fourth day of an outbreak in responded to and non-responded to outbreaks, analysing a total of 3,887 targeted interventions which were notified to UNICEF¹¹. The review was based on the identification of 456 cholera outbreaks across 290 different localities, including 176 that were responded to by at least one complete CATI.

Key findings

- The sooner the first correct response was implemented by the response teams, the lower the number of suspected cholera cases. Accumulated cases reduced by 74 per cent where the first completed CATI was conducted within one day or less, compared with the first CATI completed within seven days or more of the outbreak.
- The quicker the response by the teams, the shorter the duration of outbreaks. The duration of the outbreak decreased by 64 per cent where the first completed CATI was completed within one day or less, compared with the first CATIs completed within seven days or more of the outbreak.

This evidence strongly suggests that the sooner the first response CATI is implemented using CORTs, the fewer the cases recorded and the shorter the duration of an outbreak. This demonstrates that by responding using targeted interventions delivered by specialized teams it is possible to reduce or contain transmission in households and communities.

¹⁰ Michel, E. et al., 'Estimating effectiveness of case-area targeted response interventions against cholera in Haiti', 2018. <<https://elifesciences.org/articles/50243>>

¹¹ These interventions were considered as complete if the mobile teams reported at least a door-to-door activity (education, decontamination) and a water chlorination activity (chlorine tablet distribution, chlorination at water points, chlorination of a water supply system).

PRECONDITIONS AND PROGRAMMATIC CONSIDERATIONS

The following programmatic considerations and preconditions are necessary to create an enabling environment to set up CORTs.

- Interest and willingness among national and local authorities is required to ensure an effective response and facilitate systematic adherence to the comprehensive alert-response strategy. This supports information-sharing, coordination and accountability.
- Strong information management, including a robust surveillance system and timely sharing of epidemiological data, based on a well-defined alert system to support the activation and deployment of teams.
- Strong coordination between stakeholders, including national- and local-level authorities, coordination mechanisms, such as the Health and WASH Cluster, and community leaders, are necessary for timely information management and sharing.
- The CORTs should be embedded into a comprehensive alert-response strategy that includes multiple layers of engagement with households, communities and health care facilities, providing a wide range of complementary actions to support the control and prevention of cholera transmission.
- Well-trained personnel should be available in multi-sectoral teams that include health, WASH and communication for development (C4D), with the flexibility to increase or decrease resources in response to cholera incidence and to remain agile in reacting to the 'moving target' of identified cholera hotspots.
- Materials and supplies, logistics support, and the pre-positioning of items in secure and space-efficient warehouses, are required to support the timeliness of interventions.
- Predictable, flexible and timely funding is essential for the CORTs and should be sustained. Contingency funding established with donors through a national mechanism for emergency funding is required in the absence of permanent funding sources.
- Sustainability of the CORT can be achieved when it is incorporated and supported by existing national control and elimination programmes that focus on broader public health measures, such as community-based initiatives (E.g. community health workers), with support and leadership from national and local authorities.
- Finally, the first condition is that using a CATI-CORT approach should not harm the local population; innovative Social Sciences methodologies during public health emergencies allow to monitor people's perceptions, secondary community social and health impacts and outcomes; it is recommended that where CORT are to be activated, Social Sciences analysis accompany the mechanism.



Hygiene promotion activities in a food market by a promoter of the Haitian Ministry of Health, Haiti.

Credit: ©UNICEF Haiti/2017.

MULTI-SECTORAL APPROACH AND LONGER-TERM MEASURES

The CORTs present opportunities for multi-sectoral responses to cholera outbreaks, across the Health and WASH sectors. A 2018 study assessing the potential impact of CATIs in response to cholera outbreaks found that the use of the combination of cholera vaccine, antibiotics and WASH interventions at an appropriate radius around cases could be an effective and efficient way to fight cholera outbreaks¹². The complementarity of this approach has been found to be efficient and useful when incorporated into mass intervention campaigns. The evidence also demonstrates that a multi-sectoral approach to cholera is particularly useful during the initial phase of an outbreak, when there are few cases and few available resources, and that this can ultimately reduce the duration of cholera outbreaks.



Distribution of Aquatabs to an affected household, with information on how to use them, DRC.

Credit: ©UNICEF DRC/2020.

The Global Review (see Annex 1), conducted in 2019 by UNICEF, also found that incorporating the CORTs into national surveillance and response programmes is key to sustainability. By maximizing the opportunities for the use of these types of teams, across a diverse range of disease outbreaks and public health measures, the CORTs remain available to respond quickly to a resurgence of cholera, particularly where conditions are prone to recurrent outbreaks (i.e. cholera hotspots). The CORTs can be integrated into existing programmes hosted by national governments, such as environmental health officers or community health workers that are common in many of the cholera-prone countries globally. This happened in Zimbabwe where cholera response teams were built upon the existing Environmental Health Unit of the City of Harare (see Annex 3).

To support this multi-sectoral approach and the sustainability of these teams, there is a strong need to advocate for domestic resources allocation by national and local governments and, where external donors are engaged in cholera control activities, to stress the importance of funding predictability to sustain this approach over several years, including during low transmission periods. Such funding requirements should be endorsed at country level, included in National Cholera Control and Elimination Plan or in broader national public health initiatives.

¹² Finger, F. et al., 'The potential impact of case-area targeted interventions in response to cholera outbreaks: A systems study', *PLoS Medicine*, 27 February 2018. <<https://doi.org/10.1371/journal.pmed.1002509>>

THE CORTs

Team composition and tasks

The composition of a CORT can differ from country to country; however, there is a set of core functions which is always required. It is also important to note that the minimum number of team members is usually three¹³. In countries

with community volunteers trained and equipped to deliver first response, those volunteers will have a limited number of tasks, but their initial response can be reinforced by CORTs should the epidemic become out of control.

Table 1. Team composition of CORTs

	Team Leader	Health and Hygiene Promoter	Driver
Role and responsibilities	<ul style="list-style-type: none"> • She/he oversees and organizes the daily work of the team • Collect WASH and Epi data related to the cases to be responded to • Communicates with local authorities when needed • Prioritizes and plans the responses of the day, assigning roles and responsibilities • Conducts the field investigation, which implies interviewing nurses and clinicians at health facilities and patients or relatives at households • Ensures that paper or electronic investigation and reporting forms are properly completed • Optional: in the absence of Water Quality Officer, she/he can check the chlorination level of household stored water and nearby water points within the community 	<ul style="list-style-type: none"> • She/he engages with households and local communities • Holds interactive discussion on the causes of the infection and prevention practices, health-seeking behaviours and oral rehydration at home • Supports the household members to disinfect the toilets, bathroom and surfaces spoiled with patients' faeces and vomit • In case of absence of toilets, the hygiene promoter can sensitize about the risk of open defecation and promote the construction and use of toilets with proper hand washing 	<ul style="list-style-type: none"> • She/he drives the team's car and must contribute to the work by: • Ensuring the logistics of the response, and handling supplies delivered to households • In some contexts, she/he can contribute further, particularly in urban areas where driving distances are short: contributing to kits delivery to households, taking responsibility for houses' disinfection following specific training
Profile and skills	<ul style="list-style-type: none"> • Environmental health or WASH profile • Trained and experienced in faecal-oral diseases control, with good knowledge of basic epidemiology and expertise in WASH 	<ul style="list-style-type: none"> • Trained in communication for behaviour change and community engagement 	<ul style="list-style-type: none"> • Experienced driver, having a sound knowledge of the area, with logistics abilities
Additional members	Health and Hygiene Promoters: she/he holds the same responsibilities and profile as cited above. Water Quality Officer: she/he is responsible for: <ul style="list-style-type: none"> • taking samples from household stored water and nearby water points to check chlorination levels • providing households and communities with advice on how to treat drinking and cooking water • in the event of a water point suspected of contamination, taking samples for bacteriological test (E. coli) and providing feedback to households and communities 		

Note that, depending on the country's strategy and guidelines set by the Ministry of Health (MoH), the delivery of oral chemoprophylaxis to patients' contacts or ring vaccination associated to CORT may be conducted. In this case, the team will need a member with medical skills¹⁴. The nurse's role can also include taking stool samples from health facilities for rapid diagnostics tests (RDTs) or laboratory tests.

¹³ Note that in Yemen the first teams were made up of two members, but two teams shared one vehicle; with time, a natural adaptation occurred, the two teams becoming one because teams members observed a gain in efficiency by responding together instead of having one team dropped somewhere and then waiting for the vehicle to come back to pick them up.

¹⁴ This was successfully implemented in Haiti, as part of UNICEF's experience, with collaboration with the MoH's Equipes Mobiles d'Intervention Rapide (mobile rapid response teams) (EMIRA) teams.

Training requirements

The team members should have a common set of skills, which include:

- basic knowledge and understanding of the epidemiology of cholera
- knowledge of transmission routes and risks factors
- methods and tools for transmission context assessment
- technical knowledge of appropriate water, sanitation and hygiene interventions
- methods for appropriate communication and engagement with communities.

Typically, training CORTs should take two to three days. Additional days for practical, on-the-job training may be required. An outline of a training course and examples of training materials for the CORTs are included from Haiti, Zimbabwe and Yemen (see Annex 4).

Budget and costs

The CORTs might be costly as the system is human resources and logistic intensive. However, over time this model becomes less expensive than mass WASH interventions as it is focused on targeted (and not blanket) interventions. It is also seen as an appropriate transition strategy once daily incidence starts to reduce, allowing for a targeted response to each case (suspected and confirmed).

A typical budget includes expenditures for staff salaries, vehicle rental, fuel and maintenance, personnel equipment and supplies. It is important to note that each team must have access to its own vehicle so it can be fully mobile and respond quickly to suspected cases¹⁵. The monthly cost per team vary from country to country, from about US\$3,000 per month up to US\$11,000. To support a response that targets a minimum of 10 households (approximately 50 people) around the suspected or confirmed cholera case and its household (approximately five people), providing coverage of 6,600 individuals, i.e. 55 individuals per case and 120 cases, the simple budget structure shown in Table 2 can be used.

Table 2. Example of average monthly costs for CATI teams

Description	Unit	Unit cost (USD)	Quantity	Total cost (US\$)
Driver	Person/Month	TBD*	1	TBD
Team leader	Person/Month	TBD	1	TBD
Health & hygiene promoters	Person/Month	TBD	2	TBD
Car	Car/Month	TBD	1	TBD
Fuel and maintenance	Lump sum	TBD	1	TBD
Personal consumable equipment	Lump sum/Person	TBD	4	TBD
Households' supplies	Kit/Households	TBD	120x10	TBD
Total Monthly Cost (US\$)				TBD

*TBD: To be determined

¹⁵ Cost savings can be made by ensuring that the type of vehicle used is adapted to the context, i.e., use of smaller cars in urban contexts, use of 4x4 vehicles in rural contexts. Better targeting of suspected cases can also reduce the costs, by using improved Rapid Diagnosis Test with good sensitivity and increasing laboratory capacities to prioritize areas with real ongoing cholera transmission.

Set-up of the teams

While it is difficult to set a timeline for forming a CORT, it is possible to put forward a phased approach based on UNICEF's experience in Haiti, Yemen and Zimbabwe. On average, the set-up, training and capacity-building aspects associated with the CORT can be implemented over a three-to-four-month period to be fully operational¹⁶. It is important to recognize that the process is more fluid when the teams are

formed during the preparedness stage rather than during an outbreak. Also, the CORTs can be formed much more quickly when building on an existing alert-response system, embedded within either the MoH or Ministry of Water and Sanitation, (e.g. it took about 5 weeks to have 8 CORT fully operational in Harare, Zimbabwe). The key operational milestones are outlined below in Table 3.

Table 3. Phased approach and operational milestones: setting up a CORT

Phased approach	Operational milestones
0–15 days	Development of agreements with government partners or NGOs.
15 days–1 month	Agreement with Government and NGO partners; procurement of materials and supplies prioritizing locally purchased supplies (incl. harmonized agreed hygiene promotion materials adapted to local context); draft local standard operating procedure (SOP), guidelines and protocols for activation and deployment; draft data-collection, reporting and monitoring system.
1–2 months	Training (2–3 days on cholera control), including a simulation exercise; establishment of teams.
2 months and beyond	Launching CORTs, adapted to the context and evolution of the outbreak, together with close monitoring.
3 and 6 months	Continuous monitoring, real-time evaluation of CORTs; documentation of challenges and organization of horizontal learning events for adoption of good practices, production of knowledge products (video documentary, results report).

FIELD EXPERIENCE: BUILDING CORTs WITHIN EXISTING GOVERNMENTAL INSTITUTIONS IN YEMEN AND ZIMBABWE

In 2017, to contribute limiting the spread of the massive outbreak in Yemen, community rapid response teams were activated with UNICEF support. These teams were immediately embedded in one branch of the Ministry of Water and Environment (MoWE) – the General Authority for Rural Water and Sanitation Projects (GARWSP). Given the specific context, working with NGOs would have been difficult, as NGO actors have restricted mobility because of the security context in the country. Working directly with GARWSP was also an opportunity to capitalize on the years of development donors' support to the MoWE. GARWSP's high level of technical capacity in data management also allowed for a systematic approach to data-collection that was shared daily from more than 700 teams spread across the country. If GARWSP had not demonstrated such a high level of technical and coordination capacity it would have been necessary to work with a dozen NGOs or more, resulting in a very complex monitoring system. A further advantage was that the teams' volunteers, selected by GARWSP, usually had good access to all areas, coupled with deep knowledge of their respective zones of intervention. This is a key advantage for this type of response mechanism.

In Zimbabwe, UNICEF supported the activation of response teams in 2018 to face an ongoing localized outbreak in Harare. UNICEF capitalized on the existence of contact tracing and case investigation teams, either staff or volunteers, working under the umbrella of the Environmental Health Unit of the City of Harare. These teams were already used to outbreak response and only required basic logistic support, which was provided by two NGO partners. Again, as in the case of Yemen, building on an existing system provided the advantage of the teams' local knowledge of the affected areas, and the use of strong environmental health skills to lead and guide others in implementing the response strategy.

¹⁶ Cost savings can be made by ensuring that the type of vehicle used is adapted to the context, i.e., use of smaller cars in urban contexts, use of 4x4 vehicles in rural contexts.

Response triggers and activation of CORT

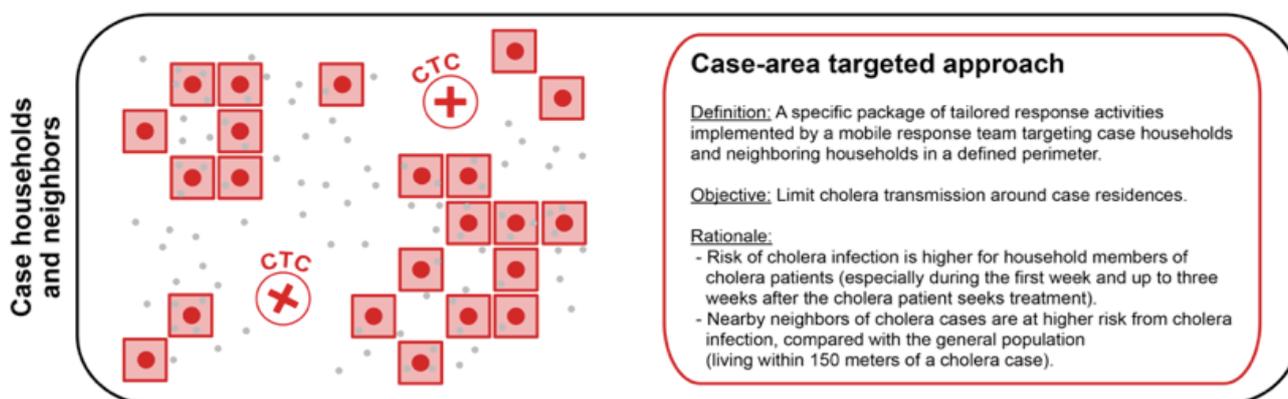
Criteria for triggering, activation and deployment of CORTs may differ depending on outbreaks characteristics and surveillance.

Triggering CORT deployment

There are two main triggers:

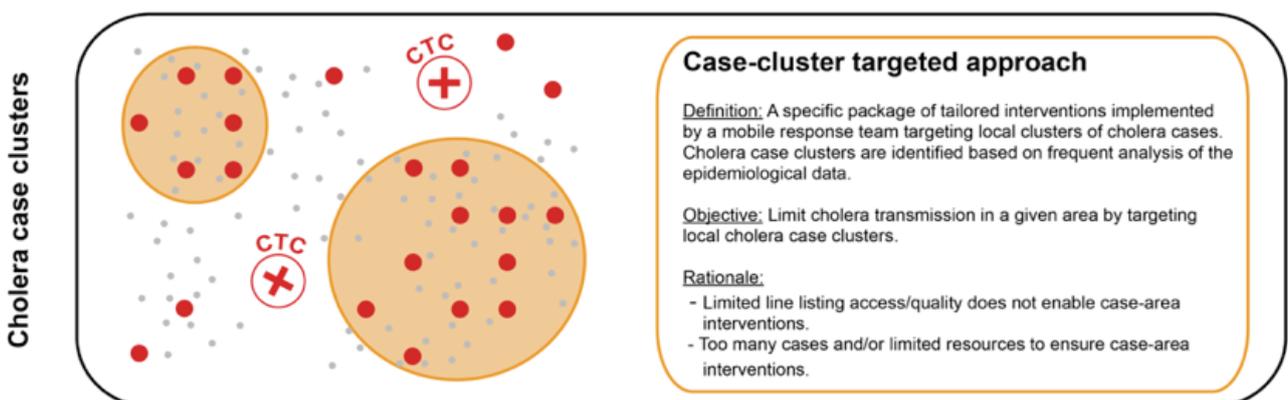
- teams are alerted of all suspected cases seen at a CTC and CTU which triggers a response for all case households and neighbours;

Figure 3. Case households and neighbours



- teams intervention can be triggered by alerts on clusters of cases, when cases are too numerous (threshold to define in each context); in each cluster, ideally, CORTs try to respond to every case, but can also opt for a blanket approach by cluster of cases, assisting all households in the cluster.

Figure 4. Clusters of cases



To identify clusters of cases, we may use the characteristics of the epidemics:

- spatial-temporal: a high proportion of new daily cases coming from the same geographical entity (village, street, neighbourhood) may constitute a cluster
- clinical: the proportion of moderate and severe dehydrated cases is higher in these areas, coupled with RDT or laboratory positive results.

However, defining clusters of cases is usually context-specific and depends on local capacities to properly analyse the available epidemiological data.

Prioritizing responses

When resources are limited and not all cases can be responded to, or not all clusters can be attended, teams will need to prioritize the response. In order to prioritize, Team Leaders should consider first:

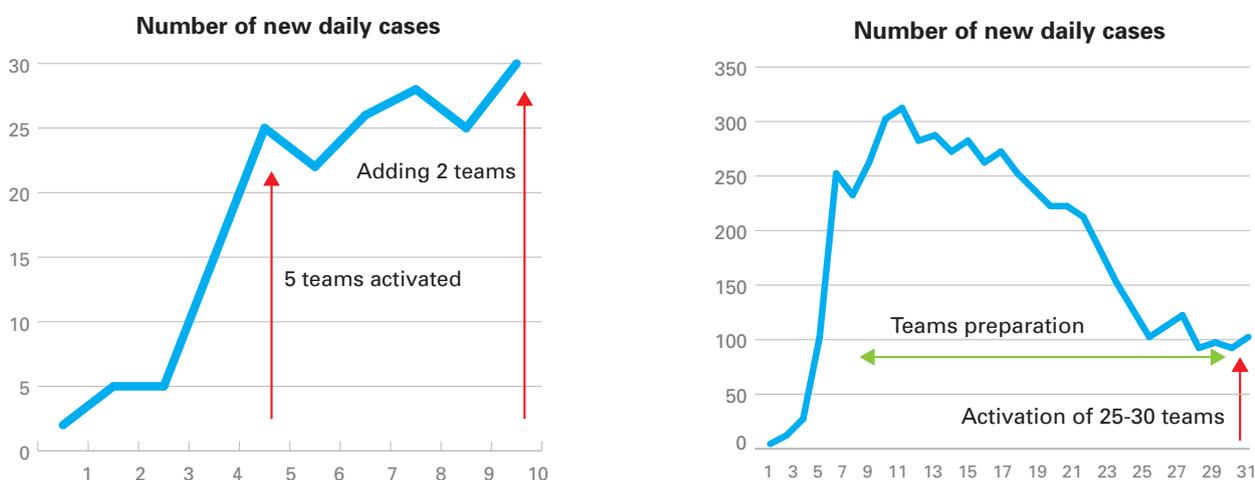
- the presence of acute watery diarrhoea-related death
- the degree of dehydration of the reported cases (moderate and severe should be prioritized) or the rate of moderate and severe dehydration among suspected cases if two clusters
- the age of the suspected cases, prioritizing children above 5 years old and adults which are more likely to be cholera cases,¹⁷ or the proportion of children under 5 years old between two clusters, prioritizing the lowest (i.e. a higher proportion of older children and adult having acute watery diarrhoea).

It is important to note that, in countries with adequate laboratory surveillance, teams can prioritize their zones of intervention based on the positivity rate of laboratory results; teams are also encouraged to return to areas with positive culture-test results to reinforce the response or undertake a follow-up of the initial response, particularly regarding the active search of new suspected cases.

Activating a CORT mechanism

Ideally CORT should be activated at the very onset of an outbreak. Whether a progressive or sudden spike is notified and we want to avoid a disease expansion, several teams can be activated immediately (e.g. Figure 5, left side, 5 - 6 teams to respond to 20 - 30 cases per day), adding more if cases continue to increase after the initial response. Such immediate activation suggests that the country and involved partners are prepared, with teams members already identified, trained, equipped and ready for deployment.

Figure 5. Number of new daily cases vs teams' activation



CORT can also be activated in the second phase of an outbreak response when a sudden massive outbreak is reported, quickly resulting in hundreds of new cases per day (e.g. Zimbabwe in 2018, Mozambique in 2019). Indeed, to response to all cases, in the example on the right, to about 250 - 300 cases per day, 50 - 60 teams would be needed immediately, which is quite impossible if they are not already prepared. In such context, the first response needs to be blanket type, with massive WASH interventions in the affected area, from chlorination of water sources, setting-up bucket chlorination point and putting in place a strong hygiene promotion and community engagement intervention. However, activation of the CORTs can be planned, prepared and activated in the following weeks.

¹⁷ Microbiological surveillance should confirm the positivity rates by age (0-1, 2-5, <5, >5) before implementing such prioritization system; it may happen that positivity rates are similar in adults and children which rules out this age-based prioritization.

The massive WASH response, sometime coupled with vaccination, will allow to reduce the incidence below a threshold that enables the teams to respond to all suspected cases as per their objectives (e.g. five new cases per day per team), or when the outbreak has reached a plateau situation (e.g. Zimbabwe) leaving about 3–4 weeks to secure funds and prepare them. (see Figure 5, on the right). Activating CORTs at this moment accelerate the control of the disease and is more cost-effective than blanket responses.

In both cases, the number of teams to be activated depends on the coverage objective. Experience shows that the higher the coverage, the better the impact. It will be needed to estimate the number of cases a team can respond to in the given context to extrapolate the number of teams required to at least 80% of all new daily suspected cases.

Finally, in endemic settings, depending on the aim of the National Cholera Control and Elimination Plan (i.e., whether it targets control or elimination), the CORTs can be implemented in cholera hotspots and aim to progressively cut the transmission, as an immediate response measure, while medium- to longer-term WASH interventions are being put into place.

Scope and type of response interventions

At household level, the CORTs implement a ‘cordon sanitaire’ for every suspected case, targeting a perimeter of 50- to 100-metre radius, around the affected household (between 10 and 30 houses depending on the habitat density). It is important to note that ‘cordon sanitaire’ is a French expression to designate the replication of work done at the cases’ houses in surrounding households, aiming to reduce the risk of secondary transmission in those households. There is no official translation, though during the last outbreak in Zimbabwe this was translated to ‘household barrier’, while in Yemen the term ‘firewall’ is being used.

CORTs implementing first response in and around case’s house within 48 hours

The interventions conducted at the affected and surrounding households primarily aim to cut the human-to-human transmission. They include:

- active search of cases
- quick transmission context assessment
- distribution of household water treatment products or chlorination of water sources at household
- water quality testing (spot-check for chlorination) at households
- direct house disinfection or support to household for promoting disinfection (kitchen, toilets, patient’s bed)
- hygiene awareness, with Cholera household kit disinfection with a focus on kitchen, toilets and patient’s bed area.

The quick transmission context assessment (TCA) is slightly different from case investigation, and is conducted by the CORTs for each suspected case. The TCA aims to better understand the main likely causes and transmission of the infection, and includes identifying potential WASH risks¹⁸.

The TCA uses a standard questionnaire developed and tailored for each context (see Annexes 10a, 10b, 10c). These questionnaires can be completed at the case’s house with other relatives; collected data is analysed quickly, ideally daily, to try to identify associations between cases and potential WASH risks. It is recommended that regular analysis (weekly or twice-weekly) is conducted to try to better understand the local triggers of the transmission.

¹⁸ Possible routes of contamination include contact with a sick person in the family, the neighbourhood, at a health facility, participation in funerals, festivities, water consumption at an unprotected source, communal meals, collective work, recent trip of sick people or a relative, regular attendance at a public place (market, schools, churches, mosque, workplace, etc.).

At community level, whenever possible and relevant, the CORTs add to the cordon sanitaire a second level of interventions aiming to reduce the risk of local transmission:

- rapid assessment of the WASH situation to identify potential risk factors (e.g. using standard WASH assessment tools to assess population access to safe water and sanitation, as well as contamination risks of water sources)
- preventive and corrective chlorination of local water systems¹⁹
- temporary chlorination of water systems and points (public or private)²⁰

- 'quick fixes' of WASH infrastructure
- hygiene awareness, supported by the distribution of hygiene materials
- mass risk communication campaign
- food hygiene awareness and control in markets, streets and restaurants.

These interventions can be done directly by the CORTs, when they are able to respond to all cases in parallel, or handed over to other actors, local authorities and NGOs in charge of addressing specific WASH-related issues. CORTs can also provide guidance to local actors and the community on how to implement key preventive WASH actions.

¹⁹ These complementary interventions are important to reach households beyond the immediate perimeter of the action and to ensure that drinking water is chlorinated throughout the community. Chlorination of the most-used water sources is done by direct chlorination in reservoirs or water systems, activating bucket chlorination or installing on-line chlorinators.

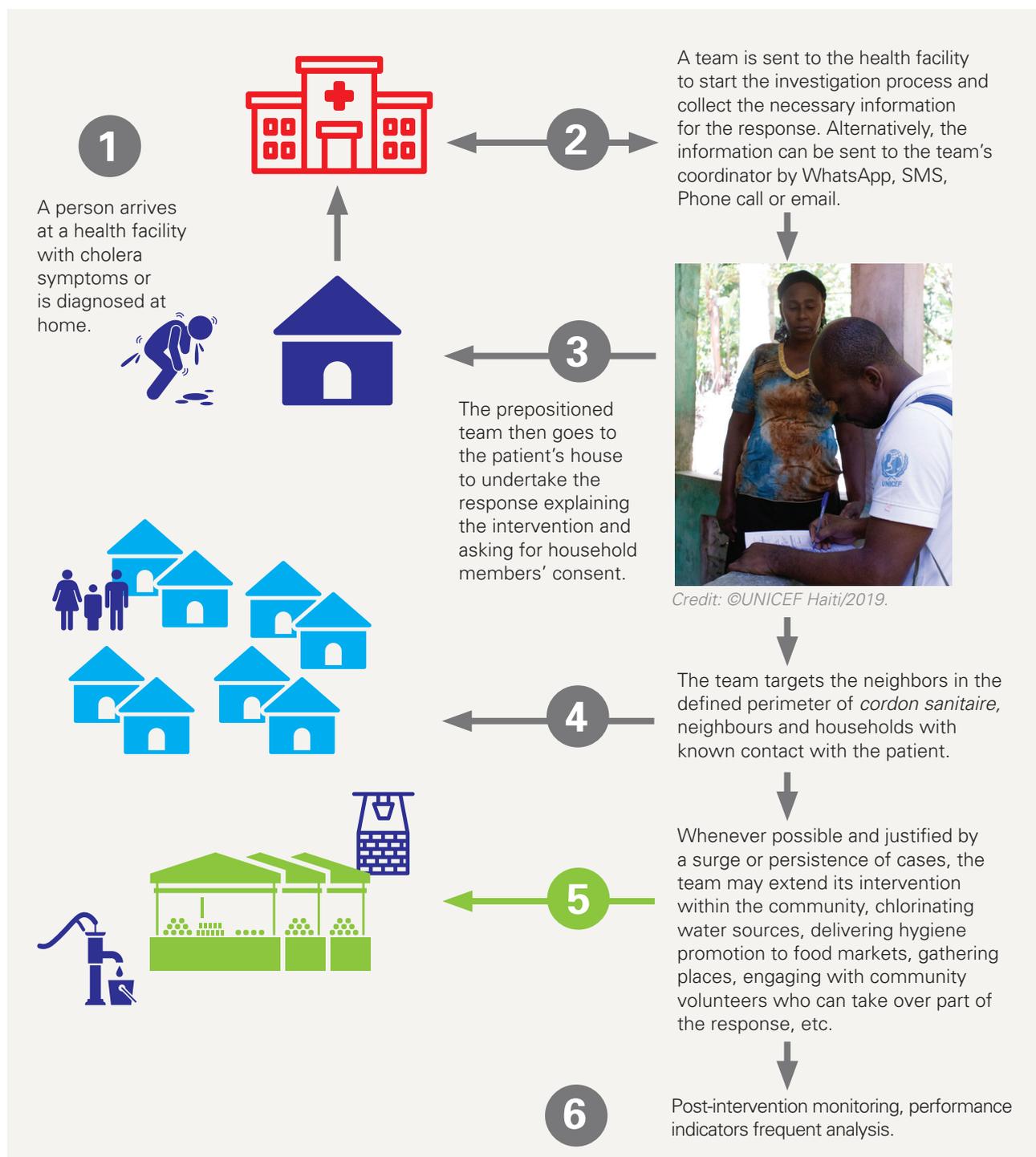
²⁰ May complement the activities delivered, but this depends on MoH's strategy.

STAGES OF RESPONSE FOR THE CORTs

This response strategy can be represented with six key stages outlined below (see Figure 6). For a detailed description of the process, refer to Annex 5.

A checklist to ensure the implementation of the response by each team can be useful to develop at country level (see Annex 6).

Figure 6. Six stages of response by CORTs



Response time

Evidence shows that the quicker the intervention the lower the risk of further transmission. Indeed, the response at household and community level aims to provide the necessary understanding and, sometimes, supplies, to people to be better protected against the infection.

Three thresholds are usually considered:

- responses within 24 hours
- responses within 48 hours
- responses within 72 hours

The aim of the CORTs to cholera cases is to respond within three days (or not more than 72 hours) of a case notification (i.e. when a case is registered as suspected cholera in a treatment facility) at the latest but, ideally, teams should respond the same day when possible, or the following day.

Response coverage

Experience in Haiti has shown that a low coverage, below 80 per cent, makes it almost impossible to control the spread of the disease. As every context is different, with varying spatial distribution of the disease the coverage objective might also be adapted. The general recommendation is to target at least 80 per cent of all suspected cases

reported. When targeting clusters of cases, the recommendation is to target 100 per cent of the cases within those clusters.

For CORT to be effective, an adequate surveillance system must be in place. CORT relies first on the capacity of health care facilities to identify suspected cholera cases, i.e. a clinical case definition, with a good sensitivity, well applied by health care workers, is required. Most importantly, the data collected by the health system must be shared with CORT managers, through line lists of cases with contact and addresses, on the daily basis, either directly at the treatment centre or via the epidemiological service. Finally, to make the CORT response as effective as possible, a systematic laboratory surveillance is desirable to guide the CORT in priority in areas with transmission of confirmed cholera cases.

MONITORING AND REPORTING

Key Performance Indicators

To support the monitoring of the CORTs, it is important to define key performance indicators adapted to the context (see Table 4).

Table 4. Monitoring indicators

Indicators	Description
Key activity indicators	
Number of cases responded to per day	Allows to assess the coverage capacity, i.e. the number of cases that teams are able to respond to per day, and to adapt the number of teams, the targeting or the overall methodology.
Number of persons or households reached per case	Corresponds to the number of households visited by a team per single case, in order to ensure a sufficient size of cordon sanitaire.
Key performance indicators	
Response time (promptness)	Defined as the time it takes from the alert to the deployment and response of the teams. This is recommended to be measured within 24 hours and within 48 hours.
Response coverage (completeness)	Defined as the number of cases responded to divided by the number of suspected cases reported. This indicator can then be stratified according to the response time.

An example of a multi-partner response monitoring report from Haiti and Zimbabwe is included below. This includes all key indicators on coordination, surveillance, response promptness and completeness, control of water quality, hygiene awareness and community engagement (see Figure 7a/b). To facilitate the monitoring of partners' projects, standard logical frameworks were also discussed and agreed with partners (see Annex 8). Figure 7a/b. Example of monitoring framework for CORTs, Haiti (next page) and Zimbabwe (below).

Figure 7a. Example of monitoring framework for CORTs

City of Harare Environmental Health Response Teams (EHRTs) - Cholera Weekly Summary						
20-25 November 2018						
	Response team indicators	Target	Beatrice Road Infectious Disease Hospital (BRIDH) EHRTs	Glenview Polyclinic EHRTs	Budiriro Polyclinic EHRTs	Total (all EHRTs)
1	Total number of suspected cholera cases reported to CTC and assigned to EHRTs	--	21	47	16	84
2	Total number of cholera cases responded to by EHRTs	--	18	31	10	59
3	% of suspected cases responded to by EHRTs	80%	86%	66%	63%	70%
4	% of EHRT responses conducted within 48 hours of presentation at CTC	80%	83%	97%	100%	93%
5	Mean number of households visited per case (i.e. "cordon sanitaire" size)	15 households	11	13	14	13
6	Number of households that received household water treatment products, soap, and IEC materials	--	217	440	174	831
7	Number of households where latrines were sprayed	--	197	53	27	277
Water sources investigated in and around cases' homes						
8	Number of FRC tests taken from stored household water	--	6	27	8	41
9	% of tested case household stored water with FRC \geq 0.5 mg/L	--	17%	4%	25%	10%
10	Number of community drinking water sources investigated during response	--	18	31	10	59
11	Number of Boreholes (handpumps and submersible pumps)	--	4	9	2	15
12	Number of Municipal Taps	--	6	16	8	30
13	Number of Water Tanks	--	0	0	0	0
14	Number of Shallow Wells (protected and unprotected)	--	7	6	0	13
15	Number of Surface Water	--	1	0	0	1
16	% of community water sources investigated during response	90%	100%	100%	100%	100%
17	Number of Free Residual Chlorine (FRC) tests taken at chlorinated community water sources	--	4	22	3	29
18	% of tested community water sources (tap, borehole with chlorinator) with FRC \geq 0.5 mg/L	--	25%	0%	0%	3%

Start Date of Report (DD/MM/YYYY)	20/11/2018		Below target
End Date of Report (DD/MM/YYYY)	25/11/2018		Almost at target
			At or above target

The CORTs are provided with several templates and forms, either paper-based or online, to support monitoring. These include templates for:

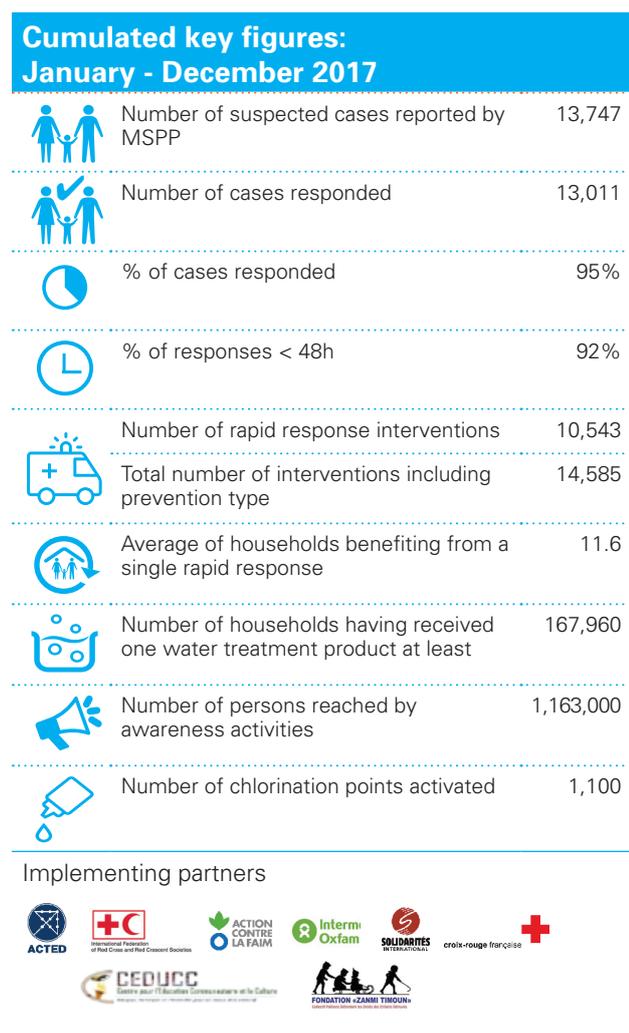
Line list of cases with response status or cases assignment forms: both forms are used to monitor the coverage of the response, i.e., the number of cases responded to against the number of cases reported.

Response data: this template contains the compiled reporting of all completed activities by each case.

Post-intervention monitoring (PIM): this template is designed and tailored to every specific context to support the mandatory post-intervention monitoring system.

Supplies form: this template tracks the delivery of supplies by location.

Figure 7b. Example of monitoring framework for CORTs



Source: UNICEF Haiti, 2017 and UNICEF Zimbabwe, 2018

Post-intervention monitoring (PIM)

Team interventions must be monitored systematically. The CORTs are monitored through a PIM mechanism. PIM should be conducted within two weeks of the implemented intervention, selecting an appropriate sample size. The PIM should measure the proper use of the supplies distributed, the understanding and application of key water, sanitation and health practices, and the level of satisfaction of the response by households. The systematic analysis of the PIM results aims to have a better understanding of local hygiene practices – while limited due to the time frame – to further protect households against the risks associated with disease transmission. In the case that the findings demonstrate little to no improvement of understanding and practices in the target population, the PIM should be used to adjust or change the response strategy. PIM

data-collection tools and templates have been used in Zimbabwe (see Annex 9).

Existing PIM questionnaire is quite long and might be adapted to the context, decreasing the length of the survey to include fewer more strategic questions. The sample size varies with the number of households responded to. The PIM should target both cholera case households and neighbors who benefited from the intervention. For less than 300 households in a two weeks period (i.e. about 20-30 suspected cases), the sample size can be up to 50% of all households. When there are between 300 and 500, 25% can be surveyed. Above 500, the sample size will be between 5% and 10%. Once the number of households to be sampled has been defined, it is recommended to follow a systematic random sampling method (see Annex 9e). The analysis should differentiate cholera case households and neighbors to capture interventions uptake for both groups.

Effectiveness and impact measurement

Evaluating the effectiveness of the CORTs is extremely complex because of many potential confounding factors and biases. When trying to measure the impact of the teams, the following are required:

- A robust monitoring system should be set up as soon as possible (see Annex 10); note that in many cholera-affected countries weaknesses in the surveillance system limit proper monitoring of response coverage and promptness.
- Define a systematic methodology to collect required data related to the response.
- Using an Integrated, Multidisciplinary Outbreak Analytics (IMOA) approach to analysis can support measuring effectiveness and place the evaluation of the intervention in context. This should include monitoring all events (political, social, displacement, other outbreaks etc.) on a timeline against CATI-CORT response. As well IMOA will follow indicators related to the social and environmental context (e.g. populations movements, social unrest, rains, flooding) that should be taken into consideration as they may have an impact on cholera transmission conditions. Integrating these variables into the analysis will help to reveal the correlation between the interventions conducted by the CORTs and the cholera trends.

Once the data are collected, it is recommended obtaining support from a scientific or academic partner, such as a university or a research institute.

To measure the impact of CORTs, at least two methods can be utilized to assess either the effect of the intervention of households practices or, more complex, the impact of the transmission of the disease:

- A prospective study can be implemented. CORTs response data need to be collected systematically together with epidemiological data. A comparison between households benefiting from CORT response and households outside the “*cordon sanitaire*” but living in the same area can be done to try measuring the effect of CORTs of households’ behaviours (e.g. home water treatment, care seeking, hand washing with soap etc.).
- A retrospective study can also be done if CORTs’ response data are properly managed. This allows the analysis of short localized outbreaks dynamics, looking for potential associations between outbreaks’ morbidity and duration versus CORTs performance indicators (e.g., promptness, completeness, size of “*cordon sanitaire*”).

CONCLUSION

The CORTs have been demonstrated to be effective in cutting the transmission of cholera in Haiti, where they were first implemented by UNICEF with all the components of the response. During its four-year existence, the CORT has been continuously adapted and reshaped by incorporating lessons learned from the field and capitalizing on the technical support from a scientific partner. This model has also been in place in Yemen for more than two years but is challenged by a weak surveillance system, due to the fragile context in which it is being implemented, which limits the ability to fully measure the impact of these teams. However, by optimizing the field knowledge from the GARWSP²¹, with the support of the UNICEF Country Office, the model’s functionality is currently being adapted

and improved. In Zimbabwe and Mozambique CORTs were activated for a short period to cope with a sudden increase of cases. As a result, the national and local authorities involved in leading and coordinating the CORTs have gained the required experience to re-initiate them easily in the event of future outbreaks .

The CORT requires a high level of human resources and logistic inputs. Despite this, it remains a simple mechanism for responding to cholera outbreaks. The actions implemented at household and community level are basic WASH interventions, and do not require a high level of technical skill. However, the complexity of the model lies in the need for strong information management, including a robust surveillance system and timely sharing of epidemiological data, based on a well-defined alert-response system, as this ultimately triggers the activation and deployment of teams. This is coupled with the need for continuous monitoring and analysis of the key performance indicators set out for the CORTs, which aids in the adaption and improvement of the model.

The CORTs are more than a rapid response mechanism. By strengthening local epidemiological surveillance and coordination of the alert-response strategy, the model aims to reinforce the capacity of countries to cope with infectious diseases outbreaks. Through continuous data-collection and analysis of the epidemiological data that guides the response, the CORT provides key information on cholera hotspots, which can be used to design long-term programmes aimed to tackle the root causes of the disease.

UNICEF supports the use and replicability of the CORTs across many different contexts. UNICEF recommends to partners and national or local authorities to consider such response mechanism, either as a preparedness measure in cholera-prone areas or in response to an ongoing outbreak. This guideline aims to support both UNICEF and its partners’ global, regional and country efforts to contribute to reach goals set by the Ending Cholera Road Map, to achieve cholera elimination by 2030, as set out by the Global Task Force on Cholera Control²².

²¹ General Authority for Rural Water and Sanitation Project

²² Edwige M. et al. (2019), *Estimating effectiveness of case-area targeted response interventions against cholera in Haiti*, eLIFESCIENCES, DOI: 10.7554/eLife.50243

ANNEXES

Annex 1. Global Review doc
<https://wrc.washcluster.net/document/global-review-water-sanitation-and-hygiene-wash-components-rapid-response-mechanisms-and>

Annex 2. Four pagers on CATI teams

Annex 3. Briefing note on Zimbabwe Environmental Health Response Teams activation

Annex 4. Haiti high-impact operation 2017 snapshot

Annex 5. Workflow of teams (i.e. steps to follow for a typical response)

Annex 6. Response checklist (Haiti, Yemen)

Annex 7. Training examples (Haiti, Yemen, Zimbabwe)

Annex 8. Standard Logframe (8a. Haiti, 8b. Zimbabwe)

Annex 9. Post-intervention monitoring (9a. Haiti format, 9b. Haiti PIM FAQ, 9c. Haiti PIM report, 9d. Zimbabwe format, 9e. Zimbabwe PDM implementation and reporting guidance)

Annex 10. Tools and templates for data-collection (10a. Haiti Fiche d'évaluation cholera simplifiée, 10b. Haiti Fiche d'évaluation cholera détaillée, 10c. Zimbabwe TCA form, 10d. Haiti NGO response database, 10e. Zimbabwe CATI Reporting form, 10f. Yemen CATI Reporting form, 10g. Zimbabwe assignment form, 10h. Zimbabwe supplies form, 10i. Model of simplified line listing for response monitoring)

The link below contains all the annexes documents for downloading:

<https://wrc.washcluster.net/sites/default/files/2020-06/Annexes%20cholera%20CORT%20Guideline.zip>

If the zip file is a problem, access is also available through the webpage Global review on RRT:

<https://wrc.washcluster.net/document/global-review-water-sanitation-and-hygiene-wash-components-rapid-response-mechanisms-and>



Published by UNICEF
3 United Nations Plaza
New York, New York 10017, USA

© United Nations Children's Fund (UNICEF)
June 2020

www.unicef.org