

**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

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## Abbreviations

ACF	Action Contre la Faim (Action Against Hunger)
ACTED	Agency for Technical Cooperation and Development
AP-HM	Assistance Publique-Hôpitaux de Marseille (Public Assistance Hospital, Marseille)
ASCP	Agent de Santé Communautaire Polyvalent (multi-sectoral community health workers)
AWD	acute water diarrhoea
CATI	case-area targeted intervention
CEHA	community engagement and hygiene awareness
CBO	community-based organization
CDC	Centers for Disease Control and Prevention
C4D	communications for development
CMI	coordonateur maladies infectieuses (coordinator for infectious diseases)
DDSO	Direction Départementale Sanitaire de l'Ouest (Departmental Health Department of the West), Haiti
DELIR	National Directorate for Epidemiology Laboratory and Research
DFID	Department for International Development (UK)
DG-ECHO	Directorate General of European Civil Protection and Humanitarian Aid Operations
DHO	Department of Health Office
DINEPA	Direction Nationale d'Eau Potable et d'Assainissement (National Directorate for Water and Sanitation Authority), Haiti
DRC	Danish Refugee Council
eDEWS	electronic disease early warning system
EOC	emergency operations centre
EMIRA	équipes mobiles d'intervention rapide (mobile rapid response teams)
EMO-EPAH	mobile eau potable assainissement hygiene (mobile water, sanitation and hygiene teams)
EMOPS	Office of Emergency Programs (UNICEF)
EP&R	emergency, preparedness and response
FRC	free residual chlorine
GARWSP	General Authority for Rural Water Supply Projects
HTH	high test hypochlorite
HWTS	household water treatment and storage
IEC	information, education and communication
IOM	International Organization for Migration
IPC	infection prevention and control
IRRM	integrated rapid response mechanism
KAP	knowledge, attitude and practice
KPI	key performance indicator
M&E	monitoring and evaluation
MoH	Ministry of Health
MoWE	Ministry of Water and Environment
MSPP	Ministère de la Santé Publique et de la Population (Ministry of Public Health and Populations), Haiti
NCP	national cholera plan
NFI	non-food item
NGO	non-governmental organization
NRC	Norwegian Refugee Council
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
OCP	Operation Coup de Poing (high-impact, rapid operation)
ORS	oral rehydration solution
PAH	Polish Humanitarian Action
PIM	post-intervention monitoring
RDT	rapid diagnostic test

RRM	rapid response mechanism
RRT	rapid response team
SOP	standard operating procedures
TEPAC	technicien eau potable et assainissement communal (drinking water and communal sanitation technician)
TPM	third-party monitoring
UNICEF	United Nation International Children's Fund
URD	Unités Rurales Départementales (Rural Department Unit)
WASH	water, sanitation and hygiene
WiE	WASH in Emergencies (UNICEF)
WFP	World Food Programme

# Acknowledgements

This review was conducted by Monica Ramos, consultant, under the supervision of the Timothy Grieve, Senior WASH Adviser from the WASH in Emergencies (WiE) team at UNICEF's headquarters. This report presents a global review of the water, sanitation and hygiene (WASH) components of the UNICEF-supported rapid response mechanisms (RRMs) and rapid response teams (RRTs), with a focus on the use of RRTs in outbreak settings. It provides insights into the the WASH components of the different types of RRT models based on four country settings: Haiti, Nigeria, South Sudan and Yemen. It is a result of collaboration and contributions from UNICEF and external stakeholders, including partners in government and non-governmental organizations (NGOs).

The review benefited a great deal from background research and data analysis conducted on secondary data shared by UNICEF's headquarters, regional and country

offices and external stakeholders. In addition to a review of secondary data, key informant interviews were conducted. These explored operational and performance aspects of RRTs, along with challenges faced, best practice and lessons learned. The interviews resulted in operational recommendations based on our key findings, programmatic learning and best practice, and specific guidance on replication of the RRTs in outbreak settings.

UNICEF's WiE team would like to thank and express appreciation for the efforts of UNICEF's colleagues at country, regional and headquarters level, along with external stakeholders, including government and NGOs, who contributed to this review. Responsibility for the views expressed and the way in which data have been used or presented in the report rests with the author and contributors.

# Executive summary

In recent outbreak settings, the use of rapid response teams (RRTs) to support the WASH sector has increased. RRTs have been used as part of the response to cholera outbreaks in countries such as Haiti, Yemen, Somalia, South Sudan and the Democratic Republic of the Congo, with the scope of these teams varying widely. As the presence of RRTs becomes more common in outbreak settings, it is important to better understand and document the different types of models in use.

UNICEF's WASH in Emergencies (WiE) team has conducted a global review of the WASH components of the different types of RRT models based on four country settings: Haiti, Nigeria, South Sudan and Yemen. The review used a mixed-methods approach that included qualitative and quantitative data-collection methods. A review of secondary data of published and grey literature was conducted, including 80 relevant documents from the countries in question. In addition, 28 in-depth key informant interviews were conducted with internal and external stakeholders, including partners in government and non-governmental organizations (NGOs). The review explored operational and performance aspects related to RRTs, along with challenges faced, best practice and lessons learned.

The review demonstrates that the RRT model is an indispensable mechanism for supporting cholera response and prevention activities in the different countries in which it has been used. Through the systematic use of surveillance systems and available epidemiological data, RRTs target affected households and at-risk populations in the community. Through early detection at the beginning of an outbreak and the prompt use of RRTs play a critical role in avoiding further spread of the disease. The RRT model is evidence-based and provides an integrated and harmonized package that specifically targets pathways for cholera transmission. It is essential to reducing the spread of cholera and the risks to affected and at-risk populations. RRT interventions provide an immediate and timely response, with the potential to reduce and/or 'slow down' transmission. The knowledge gaps associated with measuring the effectiveness and impact of RRTs are recognized as an area for future action.

The RRT model is embedded in 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. The RRT model can be sustained when it is incorporated and supported by national control and elimination programs that focus on broader public health measures, such as community-based initiatives, with support and leadership from national authorities.

To support the replication of RRT models, the development of an operational guideline for different settings and contexts is strongly recommended. This should include tools and resources to support design, implementation, training and capacity-building, data collection, analysis and reporting, and monitoring and evaluation (M&E). Priority operational recommendations highlight the importance that coordination, surveillance, response, and M&E play in creating an enabling environment for the RRTs. The most significant factors are summarized in the main body of the report (*see Table 7*), and include:

- Interest and willingness among national and local authorities is required to ensure an effective response and facilitates systematic adherence to the comprehensive alert-response strategy, further reinforcing information-sharing, coordination and accountability.
- Strong coordination between stakeholders, including national and local level authorities, coordination mechanisms, such as the Health and WASH Cluster, and community leaders, facilitates timely information management and sharing.
- 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.
- Early detection at the beginning of an outbreak and prompt use of RRTs plays a critical role in avoiding further spread of the disease, and is further reinforced through the support and leadership of national authorities.
- Availability of well-trained personnel 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 hot-spots.
- Availability of materials and supplies, logistics support, and pre-positioning of items in secure and space-efficient warehouses, is required to support timeliness of interventions.
  - Predictable, flexible and timely funding is essential for the RRTs and should be sustained over time. Contingency funding established with donors through a national mechanism for emergency funding is required in the absence of permanent funding sources.



# Introduction

The rapid response mechanism (RRM) is an operational, programmatic and partnership model designed to enhance the humanitarian community's capacity to respond in a timely, coordinated and predictable manner to the needs of populations made vulnerable by conflict, displacement, disease and/or natural disasters in humanitarian settings. Through the RRM, UNICEF and its partners provide critical, multi-sectoral emergency responses in a wide range of sectors, including nutrition, WASH, non-food items (NFIs), health, education and protection. In 2017, UNICEF's Office of Emergency Programs (EMOPS) conducted an internal review of the RRM. The purpose of this review was to provide information regarding RRM globally, and to capture the lessons learned and best practice at country, regional and headquarters level.

In recent outbreak settings, the use of rapid response teams (RRTs) to support the WASH sector has increased. RRTs have been used as part of cholera outbreaks in countries such as Haiti, Yemen, Somalia, South Sudan and the Democratic Republic of the Congo, with the scope of these teams varying widely. As the presence of RRTs becomes more common in outbreak settings, it is important

to better understand and document the different types of models in use. This report includes a review of the WASH components of the different types of RRT models based on four country settings: Haiti, Nigeria, South Sudan and Yemen. The terms of reference for this global review are summarized in the key points below (*see Annex 1*).

- Conduct a review of secondary data and key informant interviews to document the WASH components of the different types of RRT model that are supported by UNICEF and its partners, including government and non-governmental organizations (NGOs).
- Provide a comparative analysis of the operational and performance-related aspects of the different types of RRT model, along with challenges faced, best practice and lessons learned.
- Collect case studies based on the review of the WASH components of the different types of RRT model in outbreak settings.
- Provide operational recommendations based on key findings, programmatic learning and best practice, and include guidance on replicating the RRT model in outbreak settings.

## Methodology

The review used a mixed-methods approach that included qualitative and quantitative data-collection methods. A review of secondary data of published and grey literature was conducted, including 80 relevant documents from the countries in question. In addition, 28 in-depth key informant interviews were conducted with internal and external stakeholders, including partners in government and NGOs (*see Annex 2*).<sup>1</sup> The review explored operation-

al and performance aspects related to RRTs, along with challenges faced, best practice and lessons learned.

The review was conducted over 45 days, from May to November 2018. This included discussions with resource focal points<sup>2</sup> to identify key informants and share documents, and an interactive web seminar (*see Annex 2*).<sup>3</sup>

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1 This included the use of tailored data-collection tools, adapted for different roles (coordinator, team leader, team member), and by language (English and French).  
 2 This includes people who provided introductions to key informants and sharing of documents.  
 3 The web seminar was hosted in October 2018. Presentation and recording are available on UNICEF's Sharepoint.

## Constraints and limitations

The review was constrained by the limited number of interviews conducted with key informants in some countries, primarily Nigeria and South Sudan. The review does not include accountability to beneficiaries because no primary data were collected directly in any of the

countries. The review of secondary data was constrained by the availability of qualitative data sources to further assess the level of effectiveness and impact of the different types of RRT model in all countries, and consequently the review relied heavily on quantitative data sources.





# RRTs in outbreak settings: Haiti and Yemen

## Overview

In Haiti and Yemen, the RRT model established teams to provide targeted WASH responses primarily aimed at controlling cholera transmission in households. In both countries, these teams were supported by UNICEF, in collaboration with partners in government and NGOs. In Haiti, the prediction of a potential increase ranging from 40,000 to more than 200,000 cases was the driving factor that led to the establishment and activation of RRTs in June 2013.<sup>4</sup> The RRTs provided tailored activities to control cholera transmission for every suspected case, known as case-area targeted interventions (CATIs).

RRTs comprise personnel from the Ministère de la Santé Publique et de la Population's (MSPP; 'Ministry of Public Health and Populations') équipes mobiles d'intervention rapide (EMIRA; 'mobile rapid response teams'), and from NGOs, mainly Action Contre la Faim (ACF), the Agency for Technical Cooperation and Development (ACTED) and Solidarités International (SI).<sup>5</sup> There is also a complementary structure in place, through the équipes conjointes d'engagement Communautaire, (ECEC; 'community engagement and hygiene awareness teams'), known as the CEHA, which work closely with RRTs. These teams provide follow-up support focused on cholera prevention in affected and at-risk populations through community engagement and mobilization. Additionally, the Direction Nationale d'Eau Potable et d'Assainissement (DINEPA; 'National Directorate for Water and Sanitation Authority') has established mobile WASH teams (EMO-EPAH;

'mobile eau potable assainissement hygiène') that carry out 'quick fixes' of existing WASH infrastructure and chlorination of water sources at the request of any partner working in the affected areas. These mobile WASH teams reinforce existing DINEPA Technicien Eau Potable et Assainissement Communal (TEPACs; 'drinking water and communal sanitation technician'), whose role is to support development-focused activities rather than the emergency response. The WASH teams are supported by an engineer acting as the emergency focal point under the Unités Rurales Départementales (URD; 'Rural Department Unit'), which has responsibility for liaising with the community through DINEPA's regional offices for more development-focused activities, including training water committees and mapping water points.

In **Yemen**, RRTs were activated at the height of the outbreak in August 2017 and provided tailored activities to control cholera transmission by targeting affected populations in hot-spots<sup>6</sup>, along with preparedness and prevention activities targeting at-risk populations. As in the case of Haiti, the driving factor that led to the establishment and activation of RRTs in Yemen was the cumulative case-load, comprising 621,209 cases since October 2016, with predictions of a potential increase into the millions.<sup>7</sup>

RRTs comprise personnel from the emergency unit of the General Authority for Rural Water Supply Projects (GARWSP), which operates under the Ministry of Water

4 Rinaldo et al. (2018)

5 Note that Oxfam was also part of the RRT model until June 2018.

6 These are considered as the areas most affected by cholera, with active transmission.

7 WHO (2017)

and Environment (MoWE). RRTs were initially designed to function as part of the emergency operations centre (EOC) and to include teams at national, governorate and district levels.<sup>8</sup> However, due to issues related to the activation of the EOC, RRTs function under the emergency unit of GARWSP, with the EOC providing epidemiological data collected from the line lists in healthcare facilities or treatment institutions to support their activation and

deployment. There is also an existing RRM that supports multi-sectoral responses through a pre-defined package for WASH, NFIs, nutrition and unconditional cash transfers, which is implemented through partnership agreements with UNICEF, ACF, ACTED and Oxfam. This mechanism also has mobile teams that can provide immediate assistance within a maximum of one week, with WASH being one of the main components of most responses.<sup>9</sup>

## Alerts, activation and deployment

**Haiti** has an alert-response strategy that guides the triggering of alerts, along with activation and deployment of RRTs.<sup>10</sup> In July 2013, the National Directorate for Epidemiology Laboratory and Research (DELIR) established a national alert system, which was designed to monitor the outbreak and response strategy, based on cholera surveillance data at the district and departmental levels. It comprises three stratified levels of alert: red, orange and green. The criteria used to define these levels are based on the number of suspected cases and associated deaths (above age five) during the previous seven days. The surveillance system relies on epidemiological data collected from the line lists in healthcare facilities or treatment institutions that are consolidated daily by the Department of Health Office (DHO), with the support of NGOs (by phone or in person visits).<sup>11</sup> Daily compilation of suspected cases is centralized by the DELIR. The DELIR validates all departmental and district data and gathers data into a national database. MSPP publishes this information in a weekly bulletin, which in turn provides an overview of the districts with the highest number of cases, in order to support prevention and response efforts. The triggering of an alert results in the activation and deployment of RRTs for every suspected case. CEHA teams reinforce RRTs' immediate intervention by providing follow-up in locations where:

- the highest number of cases have been reported in the last two weeks
- transmission has continued for more than two weeks
- the highest number of outbreaks have been reported in the previous six months.

CEHA teams are activated and deployed once RRTs have responded to all the daily cases, or once RRTs are no longer needed (*see Figure 1*).<sup>12</sup>

The analysis of data for response alerts and activations of RRTs in 2017 demonstrates that, once an alert was triggered, the RRT was deployed in under 48 hours in 84 per cent of suspected cases.<sup>13</sup> In 2018, this improved to 85 per cent within 48 hours and 75 per cent within 24 hours, with 93 per cent of all suspected cases being responded to by the RRTs.<sup>14</sup>

The alert system uses electronic tools, including an online database, Google Docs and WhatsApp for information-sharing between RRTs. Activation and deployment of RRTs can be through two distinct pathways (*see Table 1*).<sup>15</sup>

8 The health-specific RRTs that support investigation and surveillance were also included.

9 UNICEF (2017c)

10 UNICEF (2018e)

11 Based on lessons learned, the recorded cases were originally only referenced by the healthcare facility or treatment institution that provided treatment. From 2017, the information provided includes specific details of the patients' addresses and locations to further facilitate the timeliness of the RRTs' response, based on epidemiological analysis and the dynamics of local transmission.

12 Rebaudet et al. (2018)

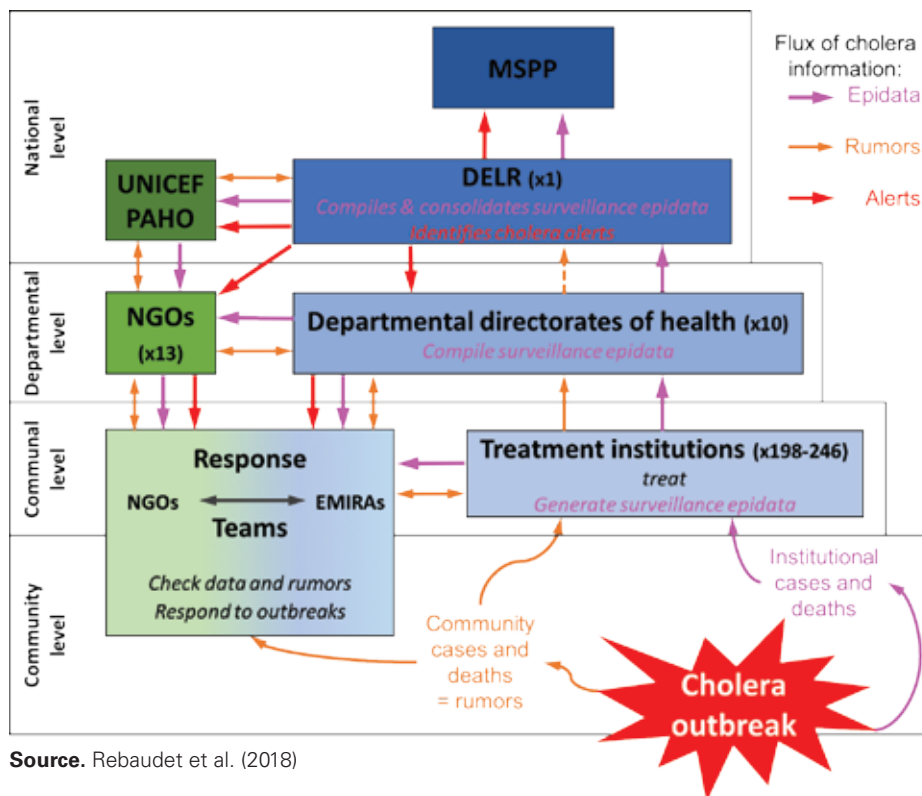
13 UNICEF (2018a)

14 UNICEF (2018b)

15 UNICEF (n.d., a)



**Figure 1.**  
**Alert-response at community, district, departmental and national level in Haiti**



Source. Rebaudet et al. (2018)

**Table 1.**  
**Steps for activation and deployment of RRTs in Haiti**

<b>Step 1</b>	<p>Through information shared at:</p> <ul style="list-style-type: none"> <li>healthcare facilities or treatment institutions based on nationally identified alerts (institutional cases and deaths)</li> <li>community-reported cases (community cases and deaths) through agents de santé communautaire polyvalent (ASCPs; 'multi-sectoral community health workers')<sup>16</sup></li> </ul> <p>This information is communicated to RRTs, on a regular basis, to support deployments to these locations (i.e., using photos of the line lists).</p>
<b>Step 2</b>	RRTs use an established WhatsApp group for information sharing and surveillance on cases to be followed up.
<b>Step 3</b>	RRTs use the same group to inform on the status of every case after responding.
<b>Step 4</b>	One NGO supports the DHO to consolidate daily responses and uses these, along with a comparative analysis of the line lists, to assess the completeness and promptness of responses.

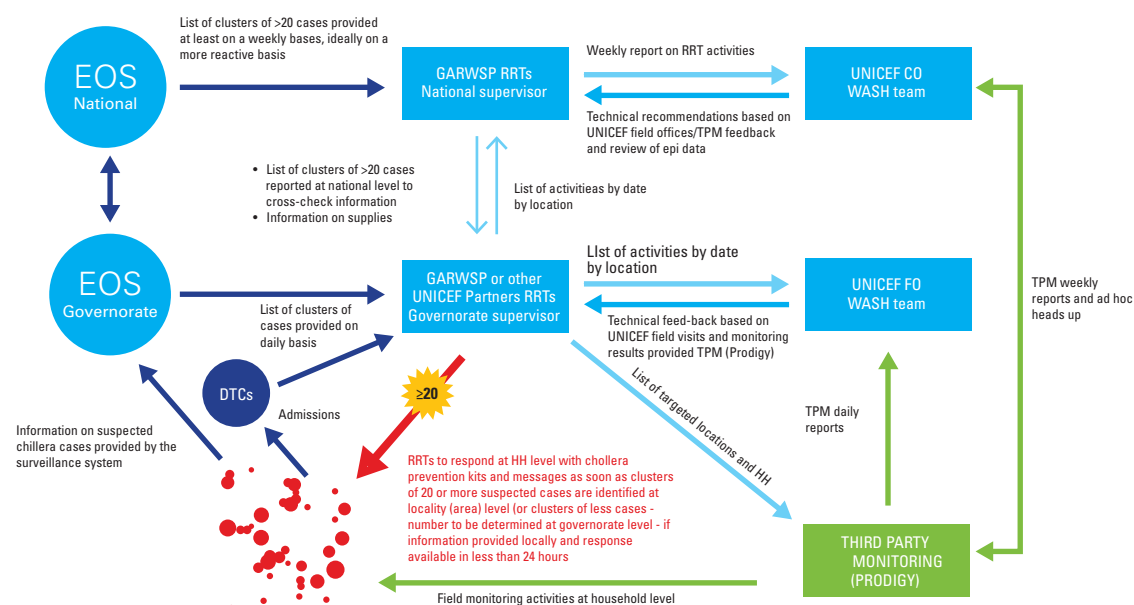
Source. UNICEF (n.d., a)

<sup>16</sup> Based on the analysis of recent post-intervention monitoring data, 35 per cent of the households cited referring primarily to ASCP for a diarrheal case in the household; 31 per cent cited contacting the health authority (i.e., communal nurse, local healthcare facility or other); 10 per cent cited referring to other and 7 per cent cited contacting NGOs directly.

**Yemen** has a cholera integrated response plan that guides the triggering of alerts, and the activation and deployment of RRTs.<sup>17</sup> In August 2017, the Ministry of Health (MoH), established a national alert system, which was designed to monitor the outbreak and response strategy, based on cholera surveillance data at the district and governorate levels. Alerts are based on the surveillance system relies on epidemiological data collected daily from the line lists in healthcare facilities or treatment institutions. However, while targeting criteria have been established to define an alert, the framework is basic, and there is no categorization to support the prioritization of alerts, as in the case of

Haiti.<sup>18</sup> The system compiles daily suspected cases, which are transmitted from the district and governorate level to the MoH, at national level.<sup>19</sup> Data are centralized nationally using the electronic disease early warning system (eDEWS). Owing to the scale of the outbreak and high number of suspected cases, the triggering of an alert was designed to respond to approximately 25 per cent of all reported cases, based on a 'clusters of cases' approach, based on.<sup>20</sup> This was based on the limited capacity in the country to respond to every suspected or confirmed case (see Figure 2).<sup>21</sup>

**Figure 2.**  
**Set-up and coordination of cholera integrated response plan, Yemen**



**Source.** UNICEF and WHO (2018a)

These data are also used to identify cholera hot-spots, which at the height of the outbreak were concentrated in 107 locations, and have now been reduced to 82 locations, due to a decrease in cases. The epidemiological data from these identified hot-spots support decision-making

to pre-position and target the locations for RRT interventions.<sup>22</sup> In addition to the surveillance system, regular data collection and analysis of rainfall patterns by Department for International Development (UK) (DFID), along with efforts by the Directorate General of European Civil Pro-

17 UNICEF (2017a)

18 Until March 2018, an alert was based on three episodes of loose stools within a 24-hour period. Since then, alerts are defined once a rapid diagnostic test (RDT) is confirmed as positive for cholera, with suspected cases being followed up by health authorities.

19 The information includes details of the patients' addresses and locations to further facilitate the timeliness of the RRT response.

20 A cluster of cases is defined as 20 cases or more in a given geographical area over a week period.

21 UNICEF and WHO (2018a)

22 It is important to note that there are reported in-country discrepancies regarding the criteria used to define a cholera hot-spot or at-risk districts. Additional attention and agreement are needed to be able to provide and share a standard definition. To date, criteria related to rainfall patterns, lack of infrastructure (health and WASH) and conflict data have been taken into consideration, but not systematically across all actors.

tection and Humanitarian Aid Operations (DG-ECHO), have supported decision-making on the pre-positioning of RRTs, material and supplies, and in targeting of 92 per cent of areas with rainfall.<sup>23</sup>

The analysis of data for response alerts and activations of RRTs in 2018 demonstrates that, once an alert was triggered, the RRT was activated and deployed, in under 24 hours in 3 per cent of cases, between 24 and 48 hours in 43 per cent of cases, and between 48 and 72 hours in 23 per cent of cases, suspected or confirmed. Additionally, RRTs have responded to 32 per cent of suspected cases and an average of 83 per cent of confirmed cases.<sup>24</sup>

The alert system uses electronic tools, including an online database, Google Docs and WhatsApp for infor-

mation-sharing among RRTs. As in Haiti, activation and deployment of RRTs can be through two distinct pathways (i.e., institutional cases and deaths or community cases and deaths). Despite significant efforts to optimize the timeliness of alerts, there are still recognized delays in sharing information from the surveillance system, between the district, governorate and national level.<sup>25</sup> Additionally, as caseloads have decreased over time, there have been variations in the use of the 'cluster of cases' approach and as a result, RRTs have responded to individual and/or small groups of cases reported through community-based alerts and information exchanged at national and sub-national coordination meetings. There have also been issues related to the accuracy of the data, as RRTs' have reported responding to non-cholera-related cases.

## Team composition, scope and action

In **Haiti**, the RRT consists of four members: one team leader (WASH or nurse profile), one hygiene promoter or community mobilizer, one WASH technician or nurse (depending on the team-led profile) and one driver.<sup>26</sup> They can also have at least one member from the MSPP's EMIRA, who is responsible for administering oral chemoprophylaxis to those in contact with cholera cases during hygiene awareness sessions.<sup>27</sup> CEHA teams are similar in composition, with the exception of a member from the MSPP's EMIRA and are used interchangeably with the RRTs. Mobile WASH teams from DINEPA also have a similar composition to the RRTs and CEHA teams.

Currently, there are 57 RRT and/or CEHA teams, including 47 which are concentrated in the three most affected departments of the country (*see Figure 3*). There are two mobile WASH teams (from DINEPA with support from NGOs), which are based in the West department (and available to deploy nationally. In the case of a changing caseload, there is the capacity to scale up (or down) depending on the size of the outbreak.<sup>28 15</sup>

23 This analysis is supported by the emergency unit of GARWSP's information management team. The team provides regular analysis and visualization of this information in cumulative reports.

24 This was reported during UNICEF's presentation at the Consultative Meeting in Amman (10–11 October 2018). It was also reported that urban cases are responded to within 24 to 48 hours and rural cases within 72 hours.

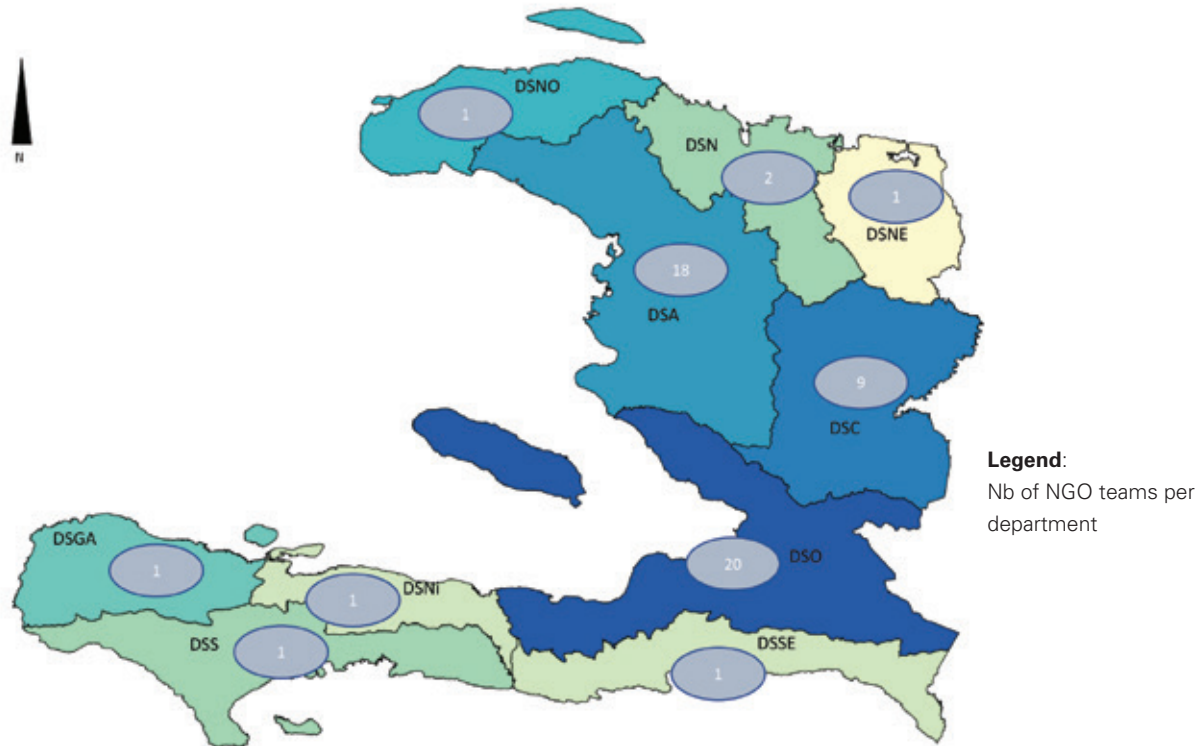
25 It can take up to three to four weeks for the epidemiological data and line lists to be compiled, validated and shared by the national level to the district and governorate level.

26 This can increase to five members, pending inclusion of EMIRA members.

27 Tasks include support to the team with all activities (i.e., household disinfection or hygiene promotion or awareness-raising).

28 The number of teams varies over time, depending on existing outbreaks which can trigger the activation of additional, temporary teams (using pre-identified NGO staff on standby). For example, in November 2016, following Hurricane Matthew, there was an increase to 80 teams nationally, followed by a decrease to 60 teams in 2017. This included 13 'mixed-teams' from NGOs and EMIRA.

**Figure 3.**  
**Number of rapid response team concentrated in the three most affected departments, 2017-2018.**



Source. UNICEF (n.d., a)

In **Yemen**, RRTs consist of two team members, one male and one female.<sup>29</sup> In addition to the field teams, there is also one national coordinator, one deputy national coordinator, and five national hub coordinators, along with 22 RRT coordinators at the governorate level. The structure also includes support for logistics, surveillance, information management, data collection, reporting and monitoring at all levels.

Currently, there are between 400 to 850 RRTs, located in 22 governorates (see Figure 4).<sup>30</sup> There are also approximately 95 standby teams that are available to be deployed, and that can be increased based on need.<sup>31</sup> In the case of a high caseload, there is the capacity to scale up in response to the size of the outbreak and seasonal variations and can also include the deployment of more than two teams to the same village or community.<sup>32</sup>

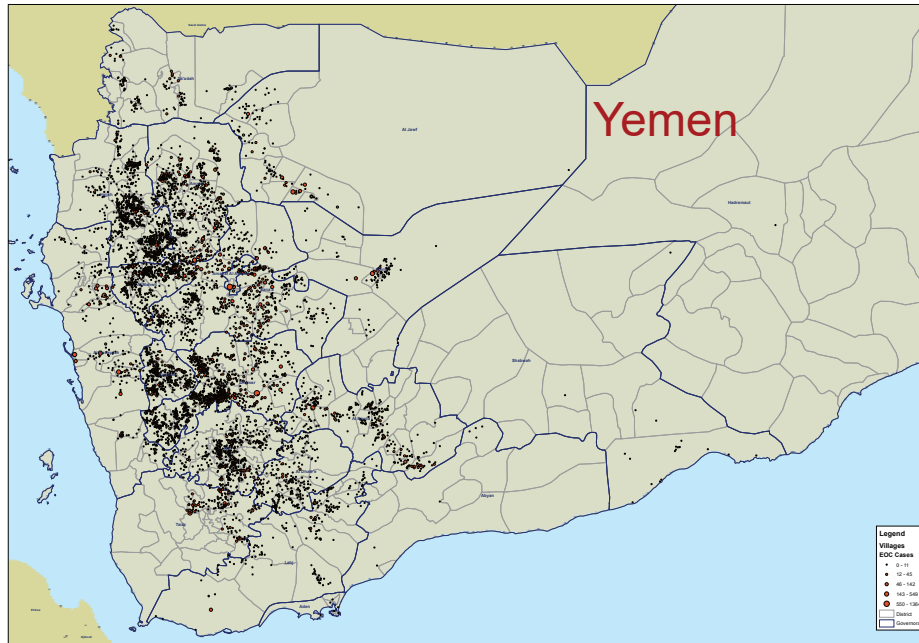
29 This number can vary based on a flexible system according to the caseload in the previous six weeks, at the governorate level. These teams are deployed to different districts based on reported cases.

30 GARWSP (2018c). This includes 736 teams for 5,000 to 6,000 cases a day; 450 teams for 1,400 and 2,000 cases a day; and 300 teams for 800 to 1,000 cases a day. This number can vary based on a flexible system according to the caseload in the previous six weeks, at the governorate level. These teams are deployed to different districts based on reported cases.

31 GARWSP (2017; 2018)

32 GARWSP (2018a). The RRT model was not designed based on a set number of teams but is dependent on epidemiological data, providing flexibility and agility in the number and size of teams in order to follow the 'moving target' of cholera incidences. In addition to the standby teams, GARWSP has also provided training to community members who can be activated as needed. The exact locations of RRTs continuously changes (based on cholera incidences).

**Figure 4.**  
**WASH RRTs, Yemen, 2018**

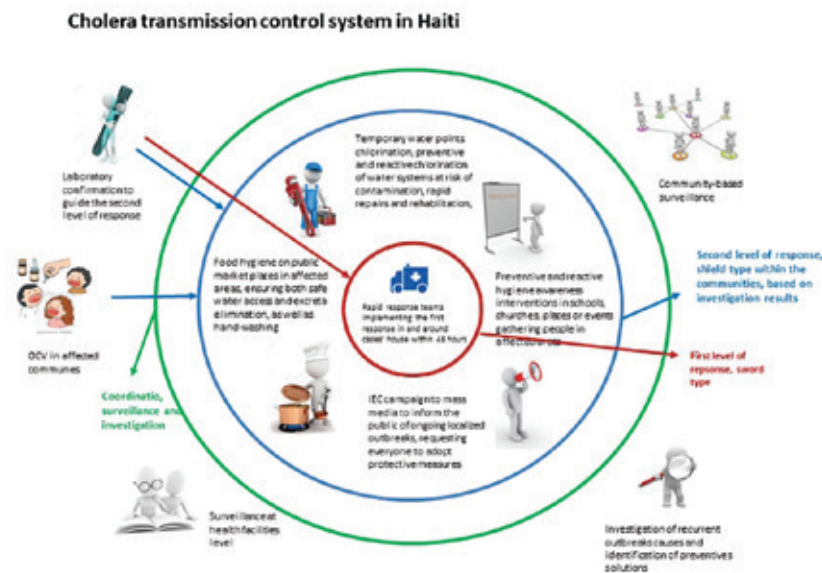


Source. GARWSP (2018a)

In **Haiti**, the key tasks and responsibilities of RRTs are to target households, communities and healthcare facilities.

This is defined as the ‘cholera transmission control system’ (see Figure 5).

**Figure 5.**  
**Cholera transmission control system, Haiti**



Source. UNICEF (n.d., a)

At the household level, the first responsibility of RRTs is to undertake a 'cordon sanitaire' for every suspected case, targeting a perimeter of 50- to 100-metres radius around the affected household (often between 10 and 20 houses), depending on habitat density. The intervention includes key activities, such as immediate investigation and active case identification, provision of oral chemoprophylaxis (by MSPP's EMIRA member), household disinfection,<sup>33</sup> water quality monitoring, delivery of hygiene promotion sessions, and distribution of a cholera kit.<sup>34</sup> At the community level, RRTs conduct a rapid assessment of the WASH situation to identify potential risk factors, provide temporary chlorination of water systems and points (public or private), and activate bucket chlorination.<sup>35</sup> The CEHA teams follow up the RRT response, focusing more broadly on community engagement and mobilization to disseminate information to local authorities and community leaders, targeting public places (markets, schools, religious centres etc.) for cholera prevention and control. The CEHA teams use different communication channels, and a diverse range of information, education and communication (IEC) methods (radio, posters etc.). This is supported by a UNICEF partnership with a semi-public mobile phone firm, Digicel, to send tailored SMS on hygiene, cholera prevention and control to affected populations during a one-week period in the event of a localized outbreak. The mobile WASH teams from DINEPA also support the response by carrying out 'quick fixes' of existing WASH infrastructure and chlorinating water sources.<sup>36</sup> At healthcare facilities, RRTs complement the clinical response by MSPP and medical

NGOs by providing WASH and infection prevention and control (IPC) support as needed, delivering hygiene promotion sessions to patients and relatives, and installing oral rehydration solution (ORS) points in communities (as needed).

In **Yemen**, the key tasks and responsibilities of the RRTs target households and communities. At the household level, RRTs visit up to 21 houses a day, on average, targeting approximately 50- to 100-metres of the immediate surrounding area, in locations or 'clusters' identified as having more than 20 reported cases, suspected or confirmed. This is similar to the 'cordon sanitaire' approach taken by RRTs in Haiti. The intervention includes key activities, such as immediate investigation and active case identification, household disinfection<sup>33</sup>, water quality monitoring, delivery of hygiene promotion sessions, and distribution of a cholera kit.<sup>37</sup> The hygiene promotion sessions are based on key messages that ensure integration of communications for development (C4D), and WASH.<sup>38</sup> At the community level, RRTs conduct rapid assessment of the WASH situation to identify potential risk factors, and provide temporary chlorination of water systems and points (public or private).

In both countries, the model is based on standard operating procedures (SOP), guidelines and protocols that define the activation, deployment, and response criteria, spatial and temporal, for the RRTs.<sup>39</sup> These include detailed terms of reference outlining the team composition, key tasks, and data collection and reporting protocols.

33 Specifically targeting traces of excreta and vomit, toilets, patients' clothing etc.

34 This includes chlorination tablets (Aquatabs), soaps, buckets etc.

35 As this work focuses mainly on preventing any further spread of the disease, it does not specifically address long-term WASH solutions. It is based on the 'Shield and Sword Strategy' to control and prevent cholera. <<http://plateformecholera.info/index.php/bonus-page-2/216-the-shield-and-sword-strategy-in-emergency-response>>

36 This includes support to local technicians, at the district level, with the provision of high test hypochlorite (HTH) during an outbreak.

37 This includes soap and washing powder for one month, water treatment products (50 tablets of 33mg Aquatabs per household), chlorine stock solution to disinfect household water buckets and jerry cans (shock chlorination), and 20-litre jerry cans for the household with the suspected or confirmed case.

38 These are based on an integrated IEC package that has been designed jointly by WASH and C4D. These include: cholera risks of transmission, importance of safe practices and early referral; importance of hand washing with soap at key moments; importance of safe water, household water treatment and safe storage (clean buckets with lids or clean jerry cans).

39 In the case of Yemen, this information is included in four different documents: WASH RRT terms of reference (only response criteria are defined, not response times); health and WASH RRTs' information flowchart; the cholera integrated response plan and WASH cluster SOP. This is unlike Haiti, where one guideline exists, organized into eight steps that outline the activation, deployment and response of RRTs.

## Training and capacity-building

Several training programs for RRTs, including initial and refresher training, have been conducted in **Haiti and Yemen**. In **Haiti**, an initial two-day training event was conducted in 2014 for RRTs (at the time, there were approximately 20 teams in the country), followed by an additional training day for RRTs and EMIRAs in the Centre and North districts by MSPP and UNICEF. A one-day training event was also conducted by UNICEF with 52 RRT team leaders in 2018, which focused on outbreak investigation methods, response design, management and organization of RRTs, WASH assessment in emergencies, and monitoring. This was cascaded to field staff in other agencies. During the first two years of establishing RRTs, on-the-job training and capacity-building were provided through the frequent presence of UNICEF cholera response specialists and Assistance Publique-Hôpitaux de Marseille (AP-HM; 'Public Assistance Hospital, Marseille') epidemiologists in the field. The two mobile WASH teams from DINEPA also received specific training in 2018. This focused on water supply in emergencies and water treatment and sanitation.

Similar training programs have been provided to RRTs in **Yemen**. These included an initial two-day training event by UNICEF for 30 to 40 RRTs in August 2017, focused on transmission contexts, epidemiology, household interventions, logistics, and monitoring and reporting. This was followed by cascade training to 16 RRT coordinators at district level. An additional, one- to two-day training event was conducted by GARWSP with 1,320 RRTs in August 2017, and with 888 RRTs in October 2017. A four-day training event was also conducted by UNICEF with RRT coordinators at district level, which focused on response criteria (spatial and temporal), intervention packages, data collection and reporting, and M&E. To date, refresher training has not been systematically conducted, and this requires further consideration, given the rate of staff turnover within RRTs. There is also recognition that C4D should be better integrated in the training package.

## Financial resources and cost-efficiency

The financial resources required to sustain the RRT model include all human and technical aspects related to salaries and incentives, operational and administrative costs, and materials and supplies. It is important to note that the RRT model is one component of a comprehensive alert-response strategy that includes multiple layers of engagement in households, communities and healthcare facilities, and that supports a wide range of complementary actions to achieve cholera control and prevention.

The costs for the RRT model in **Haiti and Yemen** are influenced by context factors, such as the geographical area covered, security and access constraints, price fluctuations, and supply shortages, that are specific to each country and its' operating environment (*see Table 2*).

**Table 2.**  
**Average monthly costs for RRT models, Haiti and Yemen**

Country	Average monthly cost per team (US\$) <sup>40</sup>	Average number of teams
Haiti	583,338	57
Yemen	1,500,000 – 1,875,000	625

In **Haiti**, based on analysed data from 31,306 WASH responses over four years, the implementation of the RRT has a total cost of less than US\$8 million a year.<sup>12</sup> This

includes US\$7 million a year for an average of 57 teams and US\$1 million a year for associated support costs by UNICEF (based on expenditures in 2017 and 2018). This

40 Unless otherwise stated, all monetary amounts in this publication are in US dollars.

results in a monthly average cost of US\$583,338 for an average of 57 teams<sup>41</sup>, and an average monthly cost of approximately US\$10,234 per team.<sup>42</sup> In **Yemen**, the average monthly cost range is US\$1,500,000 – 1,875,000 for an average of 625 teams, with costs varying depending on rural and urban settings.<sup>43</sup> This results in an average monthly cost of approximately US\$2,400 for urban teams and US\$3,000 for rural teams.

To date, there has been limited analysis of any associated costs with implementing the RRT model in different settings, including urban and rural settings, or by population density. It is therefore difficult to provide an indication of the cost-efficiency of the RRT model based on the experience of Haiti and Yemen. However, cost efficiency is one of the key performance indicators (KPIs) that should be taken into consideration when designing an RRT model.

## Partnerships and coordination

In **Haiti**, UNICEF's main partnership is with the government (MSPP and DINEPA) and NGOs to support RRTs and CEHA and mobile WASH teams. Coordination between these actors is led by, and the responsibility of, MSPP at national and district levels. This includes the support of two UNICEF cholera response specialists at the national level, in addition to cholera coordinators, (CMI: 'coordinateurs maladies infectieuses'), funded by the World Bank, in the three most affected departments. These actors collaborate and work directly with RRTs and CEHA teams to support their activation and deployment and any follow-up responses. Coordination and ways of working are still being developed between the RRTs, CEHA teams and the mobile WASH teams from DINEPA, as these teams have been operational for a limited time, with a focus on the West department (to date, only one deployment has been carried out outside this area of intervention).

In **Yemen**, UNICEF's main partnership is with the government (emergency unit of GARWSP) to support RRTs.

Coordination is led by, and under the responsibility of, the MoH and MoWE, with support from WHO and UNICEF. The RRT supervisors at district level report to the RRT coordinators at governorate level, who coordinate daily with national coordination structure for the RRTs and DHO. These resources collaborate and work directly with RRTs to support their activation and deployment. Collaboration with health-specific RRTs is in place and focuses on identification of and information-sharing of surveillance data and cholera hot-spots, on a daily and weekly basis. However, a recent evaluation of the response in Yemen cites the need for improved coordination in terms of planning and implementation of activities between the health- and WASH-specific RRTs.<sup>44</sup> This requires further harmonization in terms of planning and implementation of activities to further strengthen the overall response. A flowchart for information-sharing and ways of working between the health and WASH sectors has been developed (see *Figure 6*).<sup>45</sup>

41 This includes salaries and incentives, car rental, fuel and maintenance, materials and supplies, and operational and administrative costs for UNICEF.

42 Note this is the total cost which includes the administrative costs associated with UNICEF and NGOs. The operational cost estimate is US\$6,800 USD per month per team (i.e., rental car, fuel and maintenance: US\$2,500 USD and salaries: US\$4,300 for one team lead, two hygiene promoters or community mobilizer and one driver).

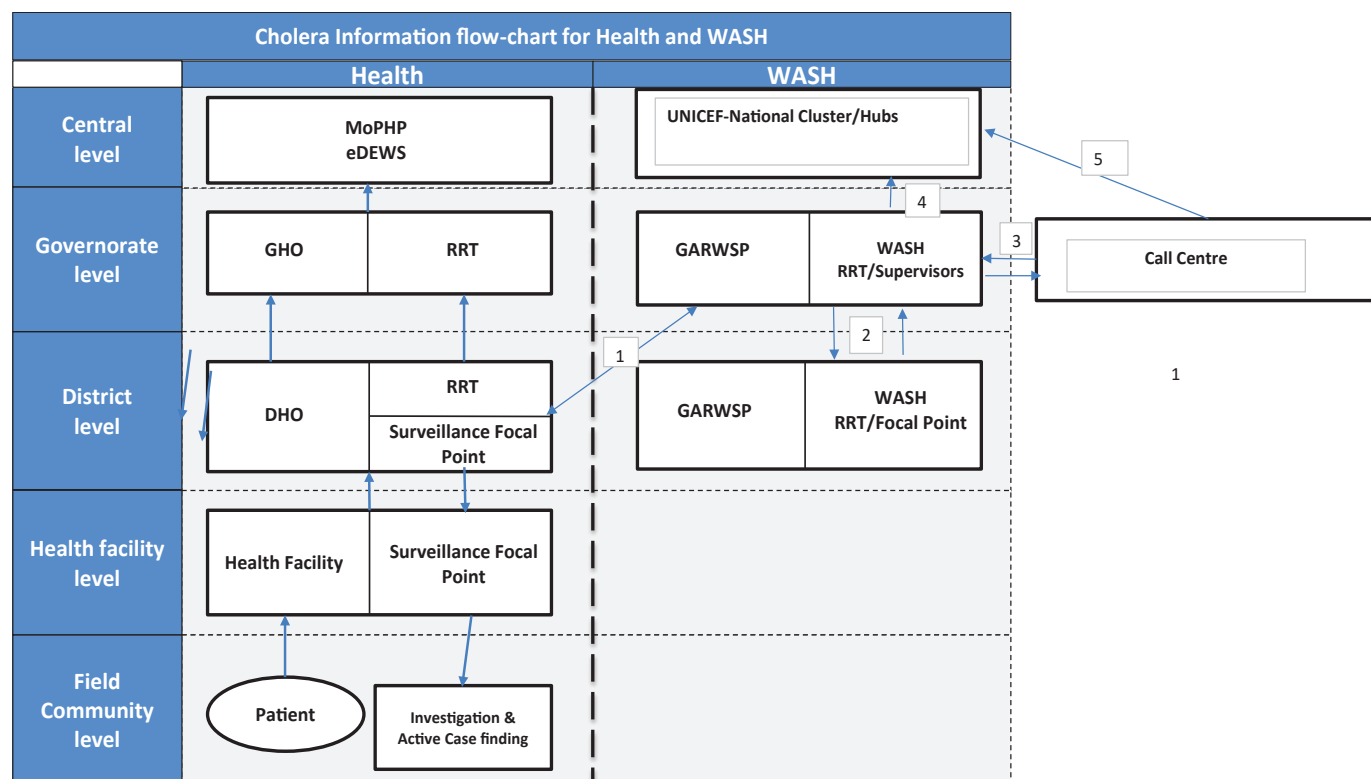
43 It has been reported that RRTs operating in rural settings are costlier than those in urban areas due to access and security constraints. The breakdown of costs is: 43 per cent for salaries and incentives, and car rental, fuel and maintenance, 54 per cent for operational and administrative costs for GARWSP, materials and supplies, and 3 per cent on other items.

44 Darcy et al. (2018: p.40)

45 UNICEF and WHO (2018b)



**Figure 6.**  
**Cholera coordination and information flowchart for health and WASH teams, Yemen**



**Source.** UNICEF and WHO (2018b)

National coordination with the WASH cluster includes involvement in weekly joint meetings to analyse the previous week's response and to review epidemiological and rainfall data to prioritize future responses, including pre-positioning of RRTs, materials and supplies. Based on the potential need for a scale-up, the WASH cluster communicates this information to partners to mobilize responses in these specific locations. At the sub-national level, the WASH cluster receives epidemiological data and line lists and conducts a regular comparative analysis of RRT interventions (mainly focused on distributed items) and partners' interventions to better understand gaps and current levels of coverage. The WASH cluster also maps the broader preventive WASH responses (underway or completed) by partners that immediately follow RRT interventions. In the case of any identified gaps, the WASH cluster liaises with partners to provide support as required. While coordination is working well at both national and sub-national levels, there is still a need to further strengthen the links between RRT interventions and the broader preventive WASH responses that are supported

by WASH partners, in coordination with the WASH cluster. This has been recognized as a key factor in optimizing the delivery of a comprehensive alert-response strategy (with RRTs as one component of this). Limited collaboration between the WASH partners active in the RRM and RRTs when responding to cholera has also been noted. This also requires strengthening to further optimize cholera response and prevention efforts in the country.

## Data collection, reporting and monitoring

In **Haiti**, data collection and reporting are mainstreamed using an electronic Google database, accessible online, that maintains historical details of responses from the end of 2014. Two types of data sets are regularly reported by UNICEF partners using standard formats, including line lists and activity reports. Data collection and reporting consist primarily of quantitative information regarding household-level interventions.<sup>46</sup> Monitoring of all activities conducted in households, communities and healthcare facilities uses a standard toolkit, known as the 'Cadre d'intervention eau potable, assainissement et hygiène prévention et réponse pour cholera'. This includes a guidance note for the overall use of the toolkit. Cholera coordinators at the department level coordinate monthly or ad hoc meetings to monitor activities and follow-up action plans. UNICEF provides regular field monitoring of RRTs and CEHA teams. NGOs conduct daily supervision of RRTs to monitor the quality of activities and ensure that proper reporting of interventions takes place using internal teams. The existing post-intervention monitoring (PIM) questionnaire has been updated, and the development of an accompanying online tool using KoboToolbox is being completed. The PIM collects information from households regularly, approximately two weeks after an intervention, and includes details regarding household visits, household disinfection, water quality monitoring and measurement of free residual chlorine (FRC), key hygiene knowledge and practice, usage of distributed items, and beneficiary satisfaction.

In **Yemen**, data collection and reporting are performed by GARWSP and include information on activities conducted at household and community levels, including rapid as-

sessments for WASH. This consists of daily reports, using an electronic tool and database, accessible online, in the field by RRT members to RRT supervisors at the district level, and then to RRT coordinators at the governorate level for consolidation and sharing with the national coordination structure for RRTs. Monthly reports are compiled by RRT coordinators nationally, using the information management unit that has been established within GARWSP. Data collection and reporting consist primarily of quantitative information regarding household-level interventions.<sup>46</sup> All information is available on the GARWSP dashboard.<sup>47</sup> GARWSP conducts daily supervision of RRTs to monitor the quality of activities and to ensure proper reporting of responses by RRT supervisors at the district level. Additionally, internal self-monitoring of RRT interventions is conducted at the household level to evaluate critical behaviours using knowledge, attitude and practice (KAP) surveys, followed by a weekly meeting with RRT coordinators at the governorate level to discuss internal findings. UNICEF staff conduct one field visit a week using a standard reporting format (not specifically tailored to the response). UNICEF also uses a third-party monitoring (TPM) firm to review the quality of activities implemented by RRTs in households. The TPM firm conducts two field visits a month, to two households with suspected or confirmed cases and two randomly selected households in the community, using the same standard tool by GARWSP and RRTs for data collection and reporting. UNICEF has engaged three WASH consultants to monitor activities, including through daily visits to households and communities where RRTs have conducted interventions. The consultants use a specific format for reporting and send weekly reports to UNICEF for compilation.

## Exit strategies

Based on the feedback from key informants, potential exit strategies for RRTs in Haiti and Yemen were identified to include a wide range of initiatives that could further optimize existing resources and capacities, along with capitalization and lessons learned over recent years. These are summarized below.

*Multi-disciplinary RRTs led by government authorities (with minimal support from NGOs)*

- In Yemen, this involves the eventual transition into the existing RRM, with GARWSP acting as the lead for all WASH-related emergencies, in collaboration with NGOs.
- In Haiti, this involves the eventual phasing out of NGO support to MSPP's EMIRA and incorporation of mobile WASH teams from DINEPA into the RRM.
- Optimization of the composition and skills of the teams should be taken into consideration, for both Haiti and Ye-

<sup>46</sup> This includes the number of chlorinated water points, number of distributed hygiene kits, number of distributed water-treatment products, and ORS sachets, and number of delivered hygiene promotion sessions.

<sup>47</sup> See <<https://tinyurl.com/y5sycscj>>

men. This requires strengthening the C4D component, in addition to convergence with any other type of RRT (e.g., health-specific RRTs in Yemen) to create multi-disciplinary response teams that are government led, with minimal support from NGOs, to further increase the accountability and sustainability of the model.

#### *Support for broader WASH emergencies and more sustainable WASH actions*

- The potential for RRTs to also conduct preventive activities, including technical assessments, awareness-raising and behaviour change, for medium- to long-term WASH programming, has been recognized for both Haiti and Yemen.
- In Haiti, the 2019 strategy focuses on increasing the autonomy of the MSPP's EMIRA, with the possibility of expanding the mandate of these teams to respond to other public health and WASH-related emergencies.<sup>48</sup> It is recognized that for this to work, a robust surveillance system is required to support a systemat-

ic response within 24 hours, along with strong engagement from government to effect capacity-building and structural investment in WASH in the country.

- In Yemen, there is a need to further integrate RRTs into the existing RRM, with the capacity to respond to any type of emergency or humanitarian crisis.

#### *Autonomy of community-based initiatives through support and leadership by national authorities*

- There is potential to increase the role and responsibilities of community-based organizations (CBOs) in leading on triggering alerts for outbreaks, with support and leadership from national authorities such as MSPP, DINEPA and GARWSP. This includes strengthening existing CBOs and the establishment of an early-warning community-based WASH surveillance system.
- In Haiti, there is an ongoing pilot in the West department with the activation of a communal health committee under the leadership of the DHO to support community-based alerts.

## Comparative analysis: Haiti and Yemen

In both **Haiti and Yemen**, the RRT model is based on an integrated and harmonized package that specifically targets pathways for cholera transmission, targeting affected households and the at-risk population in the community.<sup>35</sup>

While there are many similarities, the review has also identified distinct operational differences in each setting (*see Table 3*).

**Table 3.**  
**Comparative analysis of RRT models, Haiti and Yemen**

Component	Haiti	Yemen
Team composition	Four members <sup>26</sup> 'Mixed-teams', with multi-sectoral team members from government partner (MSPP's EMIRA) and NGOs Total of 57 teams in 10 departments	Two members. Non 'mixed-teams', with WASH only team members from government partner (GARWSP) Between 400 – 850 teams in 22 governorates
Activation	one suspected case = one alert = one response	'Cluster of cases': 20 cases or more in one geographical area over a week period (aimed to reach 25 per cent of cases)

<sup>48</sup> This type of transformation may require a reduction in the number of EMIRA staff when the cholera epidemic is close to elimination or eliminated. This also applies for mobile WASH teams from DINEPA and NGOs, which are already taking on a modified mandate to support both cholera response and other WASH emergencies related to natural disasters, displacement etc.

Component	Haiti	Yemen
Response time	In 2018, 85 per cent of suspected cases were responded to within 48 hours, and 75 per cent within 24 hours. 95 per cent response rate for suspected cases	In 2018, 3 per cent of suspected and confirmed cases were responded to within 24 hours; 43 per cent within 24 to 48 hours and 23 per cent within 48 to 72 hours. 32 per cent response rate for suspected cases and 83 per cent confirmed cases
Response coverage	10 to 20 households per case	20 to 21 households per day
Response package	Includes a case management / medical response (i.e., oral chemoprophylaxis)	Does not include a case management / medical response (i.e., no oral chemoprophylaxis)





# RRTs in other settings: Nigeria and South Sudan

## Overview

In **Nigeria**, a RRM is in place, consisting of multi-sectoral, mobile teams that can respond to newly opened or hard-to-reach areas, large population movements, disease outbreaks, and natural disasters.<sup>49</sup> The RRM was launched in 2017 and is coordinated by United Nations Office for the Coordination of Humanitarian Affairs (OCHA), with the support of other United Nations agencies and NGOs.<sup>50</sup> The RRM package covers emergency shelter, NFIs, WASH, nutrition, food security and health, based on an agreed minimum package. The RRM provides a time-bound, first-line response, followed by sector-specific responses. Responses are mobilized through coordination by the clusters in the country and are implemented within two weeks to one month following the alert.

In **South Sudan**, there is a similar mechanism in place, known as the integrated RRM (IRRM), which is coordinated by OCHA and the World Food Programme (WFP), with the support of other United Nations agencies and NGOs. In addition to the IRRM, there is also an emergency, preparedness and response (EP&R) mechanism.<sup>51</sup> This is a multi-sectoral mobile team that is able to respond to the immediate humanitarian needs of vulnerable conflict-, disaster- and/or outbreak-affected populations. The EP&R mechanism was launched in 2010, and its WASH component is considered one of its key pillars, led by the WASH cluster. The WASH EP&R can access and provide respons-

es in most locations of the country, particularly where other partners are not present. In addition, the WASH EP&R can provide guidance and capacity-building as it is supported by a group of the most experienced WASH partners in the country. It also provides outreach to local NGOs and CBOs, without a presence in the capital, to increase information-sharing between national and county levels. The WASH EP&R provides a time-bound, first-line response, followed by sector-specific responses. Responses are mobilized through coordination by the WASH cluster in the country and are implemented within two weeks to one month following the alert (with a maximum response time of up to four months).

There are also cholera-specific RRTs in South Sudan. These are supported by UNICEF and are based on a model established by WHO and the MoH to deploy mobile teams to different areas of the country to support outbreak investigation, surveillance and response. In 2017, UNICEF further evolved the model to create a multi-sectoral mobile team, including C4D and WASH partners from government and NGOs, to support cholera response. The establishment of multi-sectoral teams was based on lessons learned from the 2016 outbreak, which highlighted the capacity gaps in the country.<sup>52</sup> A response by the cholera-specific RRTs in South Sudan has yet to take place, as these were established in preparation for future outbreaks.

49 OCHA (2018)

50 OCHA (2017)

51 UNICEF (2018c)

52 At the height of the outbreak, the capacity of the government to respond was limited, and only two NGOs were able to provide support (deemed insufficient).

## Team composition, scope and action

The main WASH partners supporting the RRM in **Nigeria** are ACF, Oxfam, the Danish Refugee Council (DRC) and the Norwegian Refugee Council (NRC), which work with the WASH cluster by providing dedicated human resources, logistical capacity, and pre-positioning of materials and supplies. The mobile teams that support the RRM are activated and deployed within three days once the alert is confirmed. The teams are multi-sectoral, with one individual representing each sector, and consist of four to five individuals. The mobile teams support rapid and/or multi-sectoral needs assessments and provide a tailored response for each intervention based on the findings, adapting the agreed minimum RRM package as needed. For WASH, the response can include emergency water supply and storage, emergency sanitation and hygiene promotion. Data collection and reporting occur for each intervention and include sharing assessment results that justify the decision-making process for the response. Monitoring of interventions includes a database for tracking alerts, deployments and interventions, a beneficiary complaint mechanism, PIM data collection and analysis, and regular reviews of the RRM.

In **South Sudan**, the WASH EP&R partners, mainly SI, Polish Humanitarian Action (PAH), NRC, DRC, Medair, Oxfam and the International Organization for Migration (IOM),<sup>53</sup> work with the WASH cluster by providing dedicated human resources, logistical capacity, and pre-positioning of materials and supplies. The WASH EP&R mobile teams are activated and deployed within three to seven days once the alert is confirmed. These teams are self-sufficient to provide an initial response on arrival at the location. The teams range from four to five dedicated members, including engineers and hygiene promoters. Most WASH partners have at least two teams readily available. The WASH EP&R supports rapid WASH needs assessments and provides a tailored response for each intervention based on the findings. This can include emergency water supply and storage, hygiene promotion, distribution of NFIs, training of local community groups,

emergency sanitation and solid waste management. The WASH EP&R also establishes partnerships with local hygiene promoters and pump mechanics to support the implementation of the response.<sup>54</sup> Coordination is ongoing and regular between WASH EP&R partners, including weekly meetings in which the WASH cluster plays a pivotal role in centralizing all alerts and promoting rapid decision-making for the activation and deployment of teams. Data collection and reporting are harmonized among WASH EP&R partners, including through online tools and standard indicators. Reporting of interventions and activities occurs daily and findings are shared during weekly coordination meetings. Monitoring of the interventions includes a database for tracking alerts, baseline surveys and PIM data collection and analysis. However, this is not yet systematic and requires further harmonization.<sup>55</sup>

For cholera-specific RRTs in South Sudan, 116 team members from government and NGOs have been trained and are on standby in 18 hot-spots, along with pre-positioning of materials and supplies.<sup>56</sup> The activation and deployment of cholera-specific RRTs followed the national guidelines for RRTs, originally established by WHO in collaboration with MoH.<sup>57</sup> While activation of these teams has yet to occur, it is expected that the WASH and C4D components of the RRT will support containment and control measures, including disinfection, distribution of WASH-related NFIs and hygiene promotion. The health component of the RRT will support the investigation, surveillance and confirmation of cases. These multi-sectoral teams have already been recognized as improving coordination efforts between the health and WASH clusters. Coordination with the IRRM includes training IRRM team members on the integrated cholera response package, as a contingency measure where IRRM partners are needed to support a response in locations where the RRM is already being implemented.

53 The first six partners are all funded by DG-ECHO and are part of a quasi-consortium that supports the WASH EP&R. IOM is not funded by DG-ECHO but works in collaboration with the other NGOs, using a harmonized strategy.

54 This includes support in implementation, capacity-building, training, mentoring and on-the-job coaching, and provision of materials and supplies (i.e., tools and spare parts).

55 DG-ECHO is requesting that funded WASH EP&R partners establish a standardized monitoring system because thus far, each partner conducts internal monitoring of activities separately.

56 This was conducted over a series of cascade training events, including training the first 50 RRTs in January and February 2018, selected from 18 hot-spots with a mix of government and NGOs (approximately three individuals for each hot-spot). Based on this, RRTs in each hot-spot were responsible for training up to 10 additional RRTs in that location. The 18 hot-spots were identified in the mapping exercise completed in February 2018.

57 There is no specific protocol.



## Adaptability requirements

While there are no specific teams dedicated to cholera response in **Nigeria**, the existing mobile teams have WASH capacity and have responded to cholera outbreaks in the country on several occasions in recent years. In **South Sudan**, the WASH EP&R has also responded to cholera outbreaks on several occasions in recent years. While cholera-specific RRTs do exist, they have not yet respond-

ed to a cholera outbreak, as they were only established in early 2017. In both countries, it has been noted that the WASH components of the RRM and EP&R can be further adapted and strengthened to support cholera response. The components described below have been identified as required, based on feedback from key informant interviews.

### Hot-spot identification and mapping

Nigeria	South Sudan
<ul style="list-style-type: none"> <li>Based on the experience from 2017, outbreaks are occurring in different locations, outside traditionally mapped hot-spots due to the security context in the country and population movements. Requires updating of identified hot-spots.</li> </ul>	<ul style="list-style-type: none"> <li>This is being used to pre-position newly established cholera-specific RRTs, including materials and supplies in 18 identified hot-spots.</li> </ul>

### Preparedness and planning

Nigeria	South Sudan
<ul style="list-style-type: none"> <li>In 2017, there was a general contingency plan for the entire country, not adapted to local states. As a result, in 2018, this will be adopted by local states.</li> <li>No clear guidance exists on the elaboration of specific guidelines or protocols for use of the RRM to support cholera responses.</li> <li>Pre-positioning of human resources, materials and supplies is required to support cholera responses, particularly in areas with accessibility issues (e.g., security or seasonal constraints).</li> <li>An early-warning community-based surveillance system should be considered.<sup>58</sup></li> </ul>	<ul style="list-style-type: none"> <li>Lack of nationwide contingency planning for the entire country. This only exists for Juba.</li> <li>Coordination between IRRM, WASH EP&amp;R and cholera-specific RRTs along with health and WASH clusters and partners should be better defined.</li> <li>An early-warning community-based surveillance system should be considered.<sup>58</sup></li> </ul>

### Training and capacity-building

Nigeria	South Sudan
<ul style="list-style-type: none"> <li>Ensure that RRM WASH partners have the capacity and skills to respond in a cholera outbreak.</li> <li>Recognized need to recruit human resources with specific cholera experience and for an increased number of teams.</li> </ul>	<ul style="list-style-type: none"> <li>Training of IRRM and WASH EP&amp;R partners should be conducted using the cholera modules provided to the cholera-specific RRTs (only Medair and Oxfam have participated).</li> <li>Recognized need to recruit human resources with specific cholera experience and for an increased number of teams.<sup>59</sup></li> </ul>

<sup>58</sup> This should include continuous monitoring of risk factors (e.g., water quality). Provision of trained volunteers should be a priority in the areas with accessibility issues (e.g., security or seasonal constraints).

<sup>59</sup> Current WASH EP&R teams are not sufficiently staffed. Only six partners are responding with an average of two teams each, requiring an increase in human and financial resources.



# RRTs in all settings: Challenges, best practice and lessons learned

Documentation of how the different types of RRT models have been designed and implemented, along with mapping of where similar models are currently in place, is key to gaining a better understanding of the operational aspects of RRTs. Capitalization and documentation of the lessons learned from the different types of teams in all

countries are critical to better understand the effectiveness and impact of their interventions, along with the potential for replicability and adaptability in other settings. Based on feedback from key informants, further insights on the common challenges, best practice and lessons learned for RRTs in different contexts are summarized below.

## Challenges

### *Information-sharing and coordination*

The sharing of epidemiological data and lines lists from the MoH and other key health partners has been cited as one of the top challenges faced by those responding to cholera in **Yemen**. This includes the timeliness of information-sharing, which directly affects the ability of RRTs to deploy rapidly, as response criteria is one of the key indicators used to monitor and measure the effectiveness of RRTs. Additionally, the data provided are considered insufficient because they contain inaccurate information regarding patients' addresses and locations. This touches on the poor coordination and interaction between health- and WASH-specific RRTs in the country. There is a stated need for an integrated approach that harmonizes the two teams into one joint team that works at governorate and district levels, along with the inclusion of C4D expertise. Coordination between health-specific RRTs, the WASH cluster and its partners, and WASH partners active in the RRM has also been noted by key informants as requiring strengthening to optimize the delivery of a comprehensive alert-response strategy.

In **Haiti**, there has been a similar experience in the acceptance and willingness to contribute and share epidemio-

logical data and line lists with WASH partners, although because the model has been in existence for longer, this issue has been resolved. The experience from Haiti demonstrates that while it is possible to better integrate RRTs, harmonization across a diverse range of actors does take time.<sup>60</sup> The structure is considered achievable, although the details surrounding coordination and information-sharing require close follow-up and monitoring to ensure the timely activation and deployment of RRTs.

In **South Sudan**, similar issues related to coordination between the health and WASH cluster were cited as concerns, particularly related to the timeliness of information-sharing and alerts to WASH EP&R partners in order to provide a response. There have been instances where alerts of suspected cases of cholera by health actors have not been shared for several weeks, despite the capacity of WASH EP&R partners to provide a response. There is also a lack of clarity about how cholera-specific RRTs and WASH EP&R respond to cholera outbreaks respectively, and there is a recognized need for an integrated approach to improve coordination and optimization of the limited resources in the country.

### *Access and logistical constraints*

In **Nigeria, South Sudan and Yemen**, issues with security because of the presence of an open conflict and instability poses key barrier to accessing areas affected by cholera and the logistics of quickly deploying teams, materials and supplies is limited. In **Nigeria and South Sudan**, movements are supported using helicopters and coordinated military movements, and also by flight, through the United Nations Humanitarian Air Service (UNHAS) and by road, respectively. In **Yemen**, there can be problems obtaining permission from local authorities to access certain areas, which requires time for negotiations because there can be a high level of suspicion surrounding the implementation of these types of activities in certain parts of the country. In addition, in **Nigeria**, the deployment of teams has also been limited by the willingness of staff to work in certain insecure areas, for fear for their personal safety.

These constraints require a heightened level of planning in terms of logistics and pre-positioning, as available transport options are limited by the low frequency of available flights, poor road conditions and limited space for teams, materials and supplies. While pre-positioning is seen as a viable option that is capitalized upon in most of the countries reviewed, in **Yemen**, pre-positioning is constrained because there is limited access to secure and space-efficient warehouses (e.g., risk of airstrikes or raids by armed groups). The ability to secure the supply chain for replenishing key items, such as chlorine tabs and hygiene kits, has been gravely limited because of limitations of access to international procurement and imports, and has resulted in the need to establish contingency stocks (i.e., a minimum of six months' supply).

## Best practice

### *Established yet agile model*

All countries cited the existence of established teams supported by trained human resources and the availability of or pre-positioning of materials and supplies in most at-risk and/or hot-spot areas as key to the design of the RRT model. A robust surveillance system that provides timely sharing of epidemiological data and line lists is also important in guiding the activation and deployment of RRTs. These components are essential to enable and support a rapid response by the RRTs, and have been cited as crucial elements to the effectiveness of the model. The establishment of a monitoring system that continuously assesses KPIs to ensure that RRT interventions are tailored to the evolution of the outbreak and cholera transmission, based on epidemiological data, is also an

In **Haiti**, access is constrained by the remoteness of locations and seasonal variations, which limit the ability of RRTs to rapidly reach certain areas of the country. This is particularly problematic during the rainy season and is being addressed through the pre-positioning of materials and supplies, along with capacity-building and training of local volunteers to ensure that a response can be activated remotely, even if RRTs cannot be deployed or encounter delays in reaching these locations.<sup>60</sup>

In all cases, while these aspects can be mitigated through preparedness and planning, it is important to recognize that the ability of RRTs to respond within the defined time frame of 24 to 48 hours can be severely hindered, making it increasingly difficult to achieve one of the KPIs for cholera response.

### *Resource mobilization*

Sustaining the RRT model over time was mentioned as one of the key difficulties encountered, due to the financial requirements to support human resources, materials and supplies, and logistical support. While in the initial phases of a cholera outbreak emergency funding is readily available and can provide the financial support required, over longer periods of time, this type of funding becomes increasingly difficult to secure. This was reported for **Haiti**, where the RRTs have been in existence for almost four years. In **Nigeria**, competition for limited financial resources between the WASH component of the RRM and other regular programming has also been cited as an issue. In **South Sudan and Yemen**, funding for WASH EP&R and cholera-specific RRTs has yet to be identified as a major concern, but this could eventually arise.

important component of a comprehensive alert-response strategy. The ability to quickly adapt RRT interventions to those locations with increased cholera incidence provides allows for a good level of agility in the model. Flexibility in funding also enables the different types of teams in all countries to tailor the response based on identified needs, and enables rapid decision-making and implementation.

### *Optimization of available resources*

In most countries, including **Haiti, Nigeria and South Sudan**, coordination among different partners and sectors was cited as supporting the ability of the different types of teams to rapidly respond to outbreaks. Coordination and information-sharing with health actors, along with na-

tional authorities, including government and the military, help to support timely interventions and optimization of resources in contexts where the constraints are numerous, particularly when conducted at more local levels. Harmonization across different teams in terms of well-established SOP, guidelines and protocols, information management and reporting systems, for both implemented and monitored activities, has also helped to improve coordination and ways of working, particularly in **Haiti**.<sup>60</sup>

This is also true for **Yemen**, where the benefits recognized need of stronger links between health-and WASH-specific RRTs, the WASH cluster and its partners, and the WASH partners active in the RRM have resulted in the optimized delivery of a comprehensive alert-response strategy. The use of 'mixed-teams', with multi-sectoral team members, from MSPP and NGOs in **Haiti** also demonstrates the optimization of resources by helping to fill gaps that arise due to the limitations faced by local authorities, including the training of RRTs in immediate outbreak investigation and active case identification.<sup>60</sup>

In **South Sudan**, the role that the WASH cluster plays is crucial to the harmonization of the WASH EP&R model and supports prioritization and rapid response among NGOs. It is expected that the multi-sectoral nature of cholera-specific RRTs will be effective in further improving coordination between the health and WASH sectors, particularly at a decentralized level, as teams are composed of government partners and NGOs with diverse skills. This increases their ability to conduct immediate outbreak

investigations and active case identification, immediately followed by a joint health, WASH, and C4D response. In **Yemen**, the fact that RRTs are embedded into GARWSP, a government partner, coupled with the recruitment of personnel locally, has resulted in increasing coordination with local authorities. This is particularly important to support the RRT model, given the security context in the country.

#### *Contribution to control and prevention of cholera transmission*

In all the countries reviewed, the use of different types of teams were noted as having contributed to the control and prevention of cholera transmission. By targeting households, communities and healthcare facilities in cholera hot-spots, these teams have played a key role in further engaging the affected and at-risk populations and have supported the adoption of good practice, such as household water treatment and storage, hand washing at critical times, and the use of sanitary facilities.<sup>61</sup> Household visits by RRTs have resulted in a better understanding of the risk factors associated with cholera transmission and have also been useful in further tailoring the response. Follow-up of RRT interventions with broader preventive WASH responses, embedded within a comprehensive alert-response strategy that includes multiple layers of engagement with households, communities and healthcare facilities, has also been cited as supporting the control and prevention of cholera transmission. This further demonstrates that a wide range of complementary actions is essential in all contexts.

## Lessons learned

In **Haiti**, while there has not been a dedicated exercise in lessons learned for RRTs, there have been several review exercises to capitalize on the learning from the cholera response by MSPP, DINEPA and NGOs in recent years. There have also been various studies by the AP-HM, in collaboration with UNICEF.<sup>126062</sup> With the support of the Centers for Disease Control and Prevention (CDC), an impact evaluation of RRTs is planned. The key findings specific to the RRT model are summarized below.

#### *Use of epidemiological data and surveillance to inform and design the response*

A surveillance system that promotes timely information-sharing of epidemiological data and line lists, daily,

across all actors and at all levels, is seen as key to guiding the response and ensuring the effectiveness of interventions to control the outbreak. The lack of available laboratory data was cited as one of the main inefficiencies of the surveillance system, and has resulted in the response being guided by a 'process of elimination' (rather than accurate epidemiological data). It was also reported that strong coordination and robust information management systems should be put in place to support the timeliness of RRT interventions. It has been recognized that, through early detection at the beginning of an outbreak and the prompt use of RRTs plays a critical role in avoiding further spread of the disease.

61 Michel et al. (2018)

62 AP-HM (2016-2017)

#### *Predictable funding to support a harmonized model*

The importance of the predictability of funding to maintain the RRM is clear. This allows the geographic scope and type of interventions to remain flexible and agile enough to respond according to the evolution of the outbreak. Harmonization of the model across all partners in terms of human resources, along with materials and supplies to support response activities, is critical. Information management, data collection, reporting and monitoring are also important elements to be standardized for the model. In the absence of funds to permanently support the RRM, an agreement on contingency funding should be established with donors through the national mechanism for emergency funding (e.g., OCHA Emergency Response Fund).

#### *Collaboration with local authorities and community leaders*

Engagement and mobilization of communities through the collaboration of local authorities and community leaders, particularly on behaviour change and improvements, are considered to be another key component in supporting RRT interventions. This includes a joint review of key messages to be shared for cholera control and prevention, communication and dissemination methods as well as target audiences. The importance of a harmonized C4D package was also cited as key in supporting these efforts.

Similarly, in **Yemen**, there has been no dedicated exercise in lessons learned. However, in early 2018, UNICEF supported an evaluation of the cholera response and the WASH cluster. Its partners also conducted a 'lessons learned' workshop. These exercises helped to identify key findings and specific learning from the RRTs. Despite these efforts, there is not yet a process in place for systematic documentation of lessons learned from the RRTs. This has been recognized as a crucial next step in the evolution of the RRT model, with a descriptive study on effectiveness and impact planned by UNICEF before the end of 2019. The key findings specific to the RRT model are summarized below.

#### *Use of epidemiological data and surveillance to inform and design the response*

The capacity to use and analyse available epidemiological data and line lists to target the activation and deployment of RRTs has not been as strong or consistent as needed.

While a tool was developed, supported by UNICEF, to help focus the response appropriately, the lack of consistent support and supervision of an epidemiologist to analyse the data limited the effective use of these findings to inform and guide the operational response.

#### *Enhanced rapid response capacities*

A review of the existing RRT model is required to strengthen its use in future responses. This includes the revision of RRT SOP, guidelines and protocols, along with coordination and ways of working with health-specific RRTs, the WASH cluster and its partners, and the WASH partners active in the RRM. Appropriate pre-agreements and contracts should be put in place with operational partners and suppliers to support RRT interventions. Support for joint inter-agency contingency planning is required to define the precise role and responsibilities covered by the RRT model. Simulation exercises were also cited as an important preparedness and response action.

#### *Improve coordination between health-and-WASH-specific RRTs and WASH partners*

Strengthening coordination and ways of working with the health-specific RRTs, the WASH cluster and its partners, and the WASH partners active in the RRM has been cited as key to optimizing the delivery of a comprehensive alert-response strategy. Additionally, there have been concerns with the fact that health- and WASH-specific RRT information is not readily available, including terms of reference and contact details. This requires sharing with all WASH partners through the collaboration of the WASH cluster to further improve coordination efforts. The need to clarify the role of C4D and collaboration with health- and WASH-specific RRTs was also cited by informants.

In **Nigeria and South Sudan**, there is no harmonized system to document lessons learned internally or externally and this has been recognized as a programmatic gap. In **South Sudan**, NGOs supporting the WASH EP&R currently conduct internal reviews; however, these are not occurring jointly nor systematically. It was reported that key findings are shared during weekly coordination meetings. The WASH EP&R partners are developing a strategy to conduct regular 'lessons learned' exercises on a quarterly and biannual basis.







# Discussion

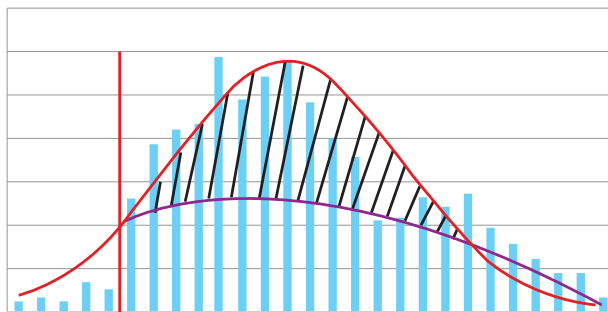
## Existing evidence: Timeliness and targeted responses

Existing studies and evidence support the rationale for targeted responses, and the basis for which the RRT model was designed and implemented in outbreak settings in **Haiti and Yemen**, specifically regarding the timelines of the response and its impact on the epidemic curve and the perimeter for interventions around suspected cases.<sup>63</sup>

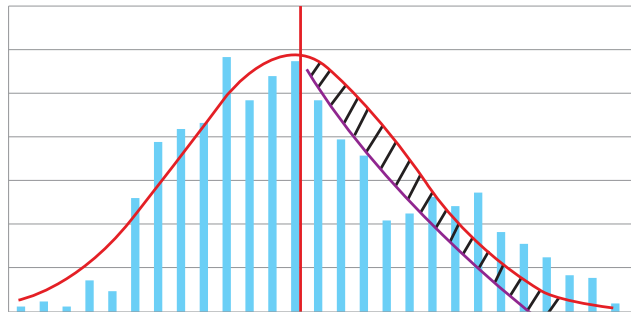
Evidence proves that early case detection and treatment act as key control measures in reducing cholera incidence and fatality rates. The early establishment and prompt use of RRTs can help to support the timeliness of the response and staying ahead of the epidemic curve (see *Figure 7*).<sup>64</sup>

**Figure 7.**  
**Timeliness of response and impact on epidemic curve<sup>65</sup>**

Scenario A



Scenario B



**Source.** Modified from Darcy, et al. (2018)

In addition, evidence also proves 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- to 100-metre radius, and five times higher within a 101- to 150-metre radius (see *Figure 8*).<sup>66</sup>

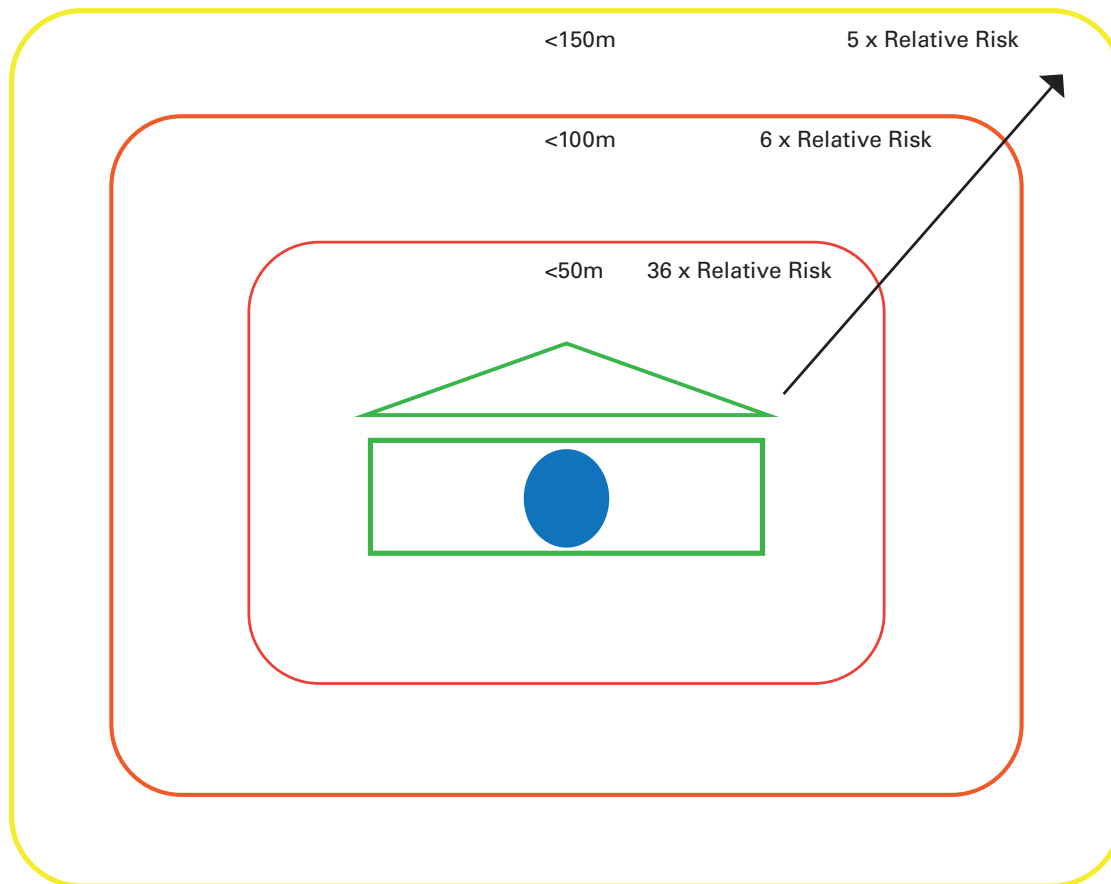
<sup>63</sup> Using the approach of a 'cordon sanitaire', as mentioned above.

<sup>64</sup> Darcy et al. (2018)

<sup>65</sup> 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)

<sup>66</sup> Azman et al. (2018) ; Debes et al. (2016)

**Figure 8.**  
**Relative risk of cholera transmission**



**Source.** MSF (2017) ; Debes et al. (2016)

## RRT performance: Effectiveness and impact

The RRT models reviewed in **Haiti, Nigeria, South Sudan and Yemen** all demonstrate key learning that can be scaled and adapted to different contexts and settings. This includes aspects related to:

- performance in terms of effectiveness and impact
- ability to provide a timely, coordinated and predictable response
- insights into the replicability of these types of models, particularly in outbreak settings.

In **Haiti and Yemen** specifically, a series of systematic reviews, research and studies, quick impact analysis and

PIM data have been analysed to better understand the correlation between RRTs' response time and coverage and a reduction in cholera incidences. Key examples have been extracted from available secondary data and are included to highlight the correlation between RRT interventions and cholera incidence in both countries. It is important to note that, despite dedicated efforts by these countries to analyse and document the effectiveness and impact of RRTs, there are still only limited qualitative data sources that can support measurement of these performance-related aspects. The knowledge gaps associated with the measurement of the effectiveness and impact of RRTs are well recognized as an area for future action.

## Systematic reviews, research and studies

### Haiti

A systematic review to assess the effectiveness of the use 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 response.<sup>61</sup> The study evaluated CATI effectiveness by comparing the number of cases from the fourth day of an outbreak in responded and non-responded outbreaks, analyzing a total of 3,887 CATIs, which were notified by RRTs to UNICEF.<sup>67</sup> 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 (see Figure 9). Key findings include the following:

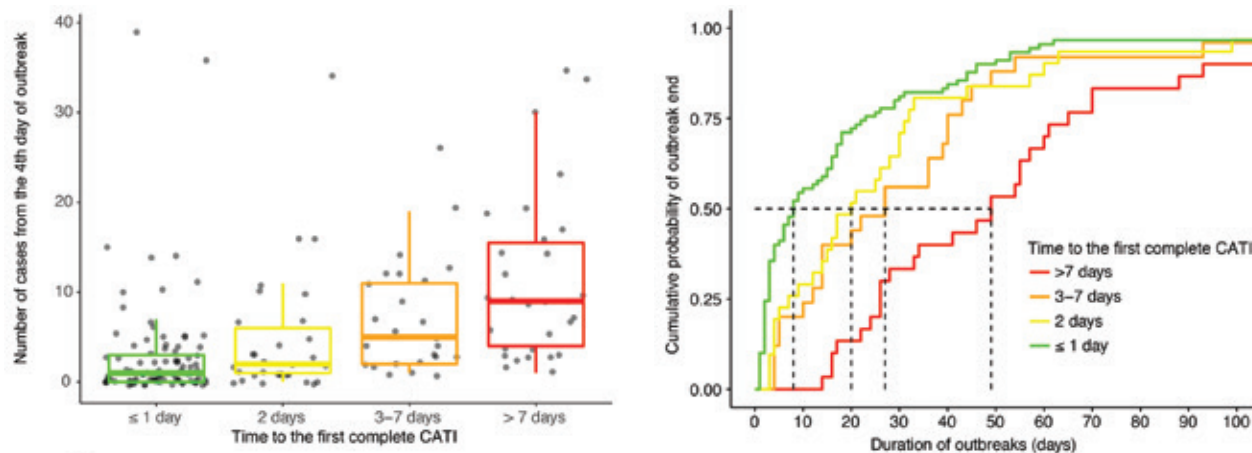
- There is increased cholera risk among neighbours living within a few dozen metres of cases during the few days following disease onset.
- Significant protection of household contacts of cholera patients is achieved through promoting hand washing with soap and treatment of water.<sup>68</sup>
- Results from a micro-simulation modelling study suggest that early targeted response interventions are

more resource efficient than mass interventions against cholera.<sup>69</sup>

- The sooner the first correct response was implemented by the RRTs, the fewer 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 CATI within seven days or more of the outbreak.
- As for the promptness of the response by RRTs, the duration of outbreaks was also significantly reduced. 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 CATI within seven days or more of the outbreak.

Evidence strongly suggests that where CATIs are promptly conducted by RRTs, this significantly shortens the duration of cholera outbreaks, with the potential to reduce and/or 'slow down' transmission. Thus, the sooner the first-response CATI is implemented, the fewer cases are recorded and the shorter the outbreak lasts.

**Figure 9.** Outbreak outcome according to the response<sup>70</sup>



Source. Michel et al. (2018)

67 CATI interventions are defined as complete if 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).

68 Based on randomized trial in Bangladesh of interventions promoting handwashing and water treatment (with kit distribution) in families of hospitalized cholera cases. Georges et al. (2016)

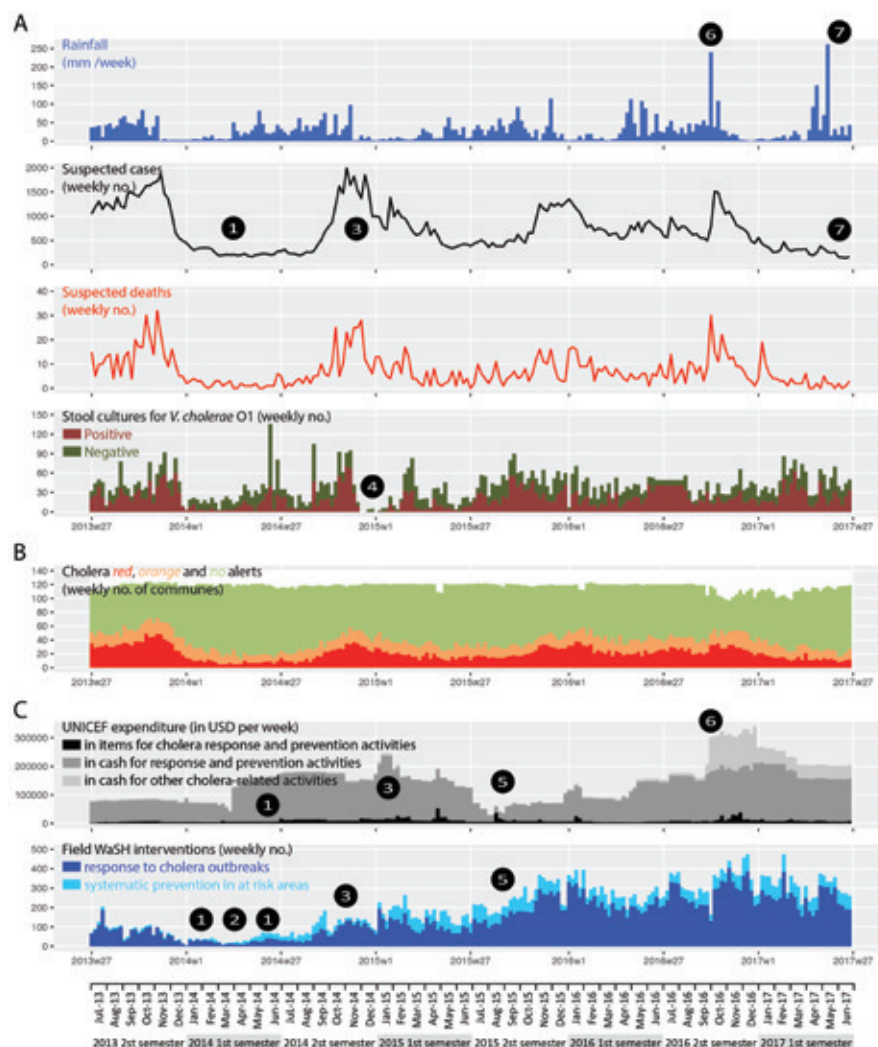
69 Finger et al. (2018)

70 (A) Comparison of the number of cholera suspected cases from the fourth day of outbreak according to the CATIs/week ratio; and (B) Kaplan-Meier comparison of the duration of outbreaks according to the CATIs/case ratio.

A four-year study of the implementation of the national alert-response strategy was conducted, covering a period of 209 weeks, from its launch in July 2013 (2013w27) to June 2017 (2017w26), including the RRTs' response. An evaluation of the efficiency and impact of the response strategy was out of the scope of the study; however, it does conclude that cholera incidence exhibited a continuous decrease over the period of the study, reducing to below 500 weekly cases in 2017, despite exceptional precipitations being recorded in April and May. In addition, analyses found that response interventions were significantly more likely and more numerous in response to red alerts compared with orange alerts. Over the course of the study, a significant improvement in the exhaustiveness (defined as the probability of response to a cholera alert), as well as the intensity and quality of interventions, was observed, independently of funds available for the strategy. The probability of launching a response intervention significantly decreased with increased rainfall, likely because of logistical difficulties. The implementation of response interventions appeared significantly heterogeneous between NGOs, districts and departments. This is based on an analysis of available evidence and information, including the evolution of accumulated rainfall and cholera epidemic indicators (panel A); cholera retrospective alerts (panel B); and implementation of the response strategy by UNICEF (panel C), on a weekly basis over the 209-week study period. (see *Figure 10*). Key findings include the following:

- There was a total of 149,690 suspected cases and 1,498 deaths. A total of 8,094 stool samples were cultured and 52 per cent tested positive for *V. cholerae* O1 (see *Figure 10 panel A*).
- A total of 31,306 responses to cholera cases and 9,450 systematic preventive interventions in at-risk areas were conducted, of which 61 per cent were conducted in towns with a red alert and 14 per cent in towns with an orange alert. Responses to red and orange alerts significantly improved throughout the study period; for example, the response to red alerts during the same week in 2013 (second semester) increased from 18 per cent to 84 per cent in 2017 (first semester). Rates for orange alerts were 10 per cent and 67 per cent respectively during the same periods (see *Figure 10 panel B*).
- Overall, 47 per cent of the 7,853 red and orange alerts received hygiene promotion sessions during the same week (a median of 209 persons per alert), and 44 per cent of alerts were responded to by decontamination of a median of 20 houses. Chlorine tablets were distributed in 44 per cent of alerts to a median of 40 households, and chlorination of water sources were implemented in 7 per cent of alerts (see *Figure 10 panel B*).
- UNICEF's total financial expenditure of US\$25.4 million (approximately US\$8 million a year), supported RRTs (including MSPP's EMIRA) and mobile WASH teams with DINEPA and NGOs. This included US\$2 million for response items (i.e., chlorine, soap, buckets and ORS) and US\$3.7 million for other cholera-related activities (i.e., cholera surveillance, coordination and other WASH prevention activities) (see *Figure 10 panel C*).
- RRTs provided hygiene promotion sessions to 2.9 million people, decontaminated 179,830 houses, distributed chlorine tablets to 757,693 households and soap to 593,494 households.

**Figure 10.**  
**Weekly evolution: Accumulated rainfall and cholera epidemic indicators<sup>71</sup>**



**Source.** Rebaudet et al. (2018)

The study does cite limitations with alerts being communicated through the surveillance system, along with non-inclusion of community cases (including inconsistent reporting of community deaths). Alert notifications were based on information collected from healthcare facilities that provided treatment and did not include patients' addresses. Therefore, RRTs directly gathered epidemiological data and line lists from healthcare facilities providing treatment and through other health authorities, which

included patients' addresses. Although it was recognized that the alerts provided a practical indicator, the weekly timescale for reporting largely exceeded the 48-hour response deadline on which RRTs based their performance indicator. This resulted in response rates by RRTs being higher than those communicated through the alert system. As previously mentioned, since 2017, a new system has been put in place, based on line lists from healthcare facilities, and which includes patients' addresses, with

<sup>71</sup> Rainfall, suspected cases and deaths (panel A); cholera retrospective alerts (panel B); implementation of the response strategy by UNICEF (panel C), from mid-2013 (2013w27) to mid-2017 (2017w26). Area-averaged cumulated rainfall was obtained from NOAA. Suspected cholera cases, cholera-associated deaths, and positive and negative stool cultures tested for *V. cholerae* O1 were provided by routine surveillance databases of MSPP. Details on expenditure and WASH interventions were provided by UNICEF.

the aim of providing more accurate data and a timelier response.<sup>72</sup>

Additionally, a review was conducted in April 2017, which provides perspectives on the impact of the rapid response and alert-response strategy, in which the RRT model plays a crucial role.<sup>73</sup> The review provides several indications of how the overall response strategy, with a large contribution from RRT interventions, has resulted in a reduction in cases in 2017, despite potentially harmful rainfall patterns. Key findings include the following:

- The approach, which involved CATIs at the patient's household and the implementation of a 'cordon sani-

taire', has proven to be effective in preventing the occurrence of secondary cases.

- The systematic review highlights a significant reduction in the duration and cumulative incidence of outbreaks because of the chlorination of water systems and points and distribution of water-treatment products.<sup>74</sup>
- Predictions based on mathematical models of major outbreaks (which did not occur) did not consider the improved capacities and resources in place to respond to cholera as a result of the strategy. Trends demonstrate that despite significant rainfall patterns, outbreaks became more and more controlled, because of the timeliness in triggering rapid response and preventive interventions to scale.

## Quick impact analysis

### Haiti

In July 2017, in a preventive measure against a potential increase in cholera cases, the Direction Départementale Sanitaire de l'Ouest (DDSO; 'West Department Health Directorate) and DINEPA launched, with the support of UNICEF and NGOs, an intensified response in the West department, with the aim of reaching the lowest cholera incidence possible before the traditional period of high transmission (i.e., September to December). This effort was referred to as 'Operation Coup de Poing (OCP: 'high-impact, rapid operation')'.<sup>75</sup> A quick analysis

of the OCP correlates the number of suspected cases, the number of rapid responses (including RRT interventions) and coverage of the rapid responses conducted, covering a 15-week period, from July to October 2017 (2017w29–2017w42). There is a demonstrated and notable improvement in the consistency of coverage of the rapid responses conducted during the OCP period, compared with previous months.<sup>76</sup> In addition, for some of the weeks, there are cited decreases in cases when measured against the number of rapid responses conducted, which largely included RRT interventions (*see Figure 11*).

72 As stated above, this has resulted in responses in fewer than 48 hours in 84 per cent of suspected cases in 2017, which improved in 2018 to 85 per cent within 48 hours and 75 per cent within 24 hours. 93 per cent of all suspected cases being responded to by the RRTs.

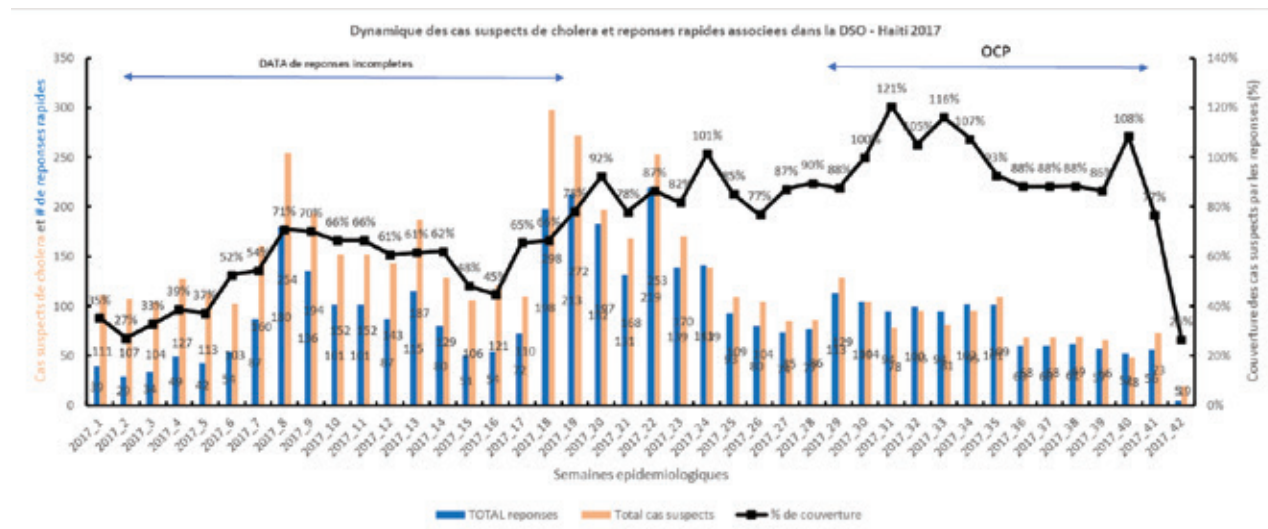
73 AP-HM (2017)

74 Outside the Port-au-Prince metropolitan area.

75 UNICEF (2017b)

76 This was partially due to incomplete reporting during the first three months of 2017, caused by a modification to the format of the online database.

**Figure 11.**  
**Trend of suspected cholera cases and associated rapid responses, West department of Haiti, 2017 (2017w1–2017w42)<sup>77</sup>**



Source. UNICEF (2017b)

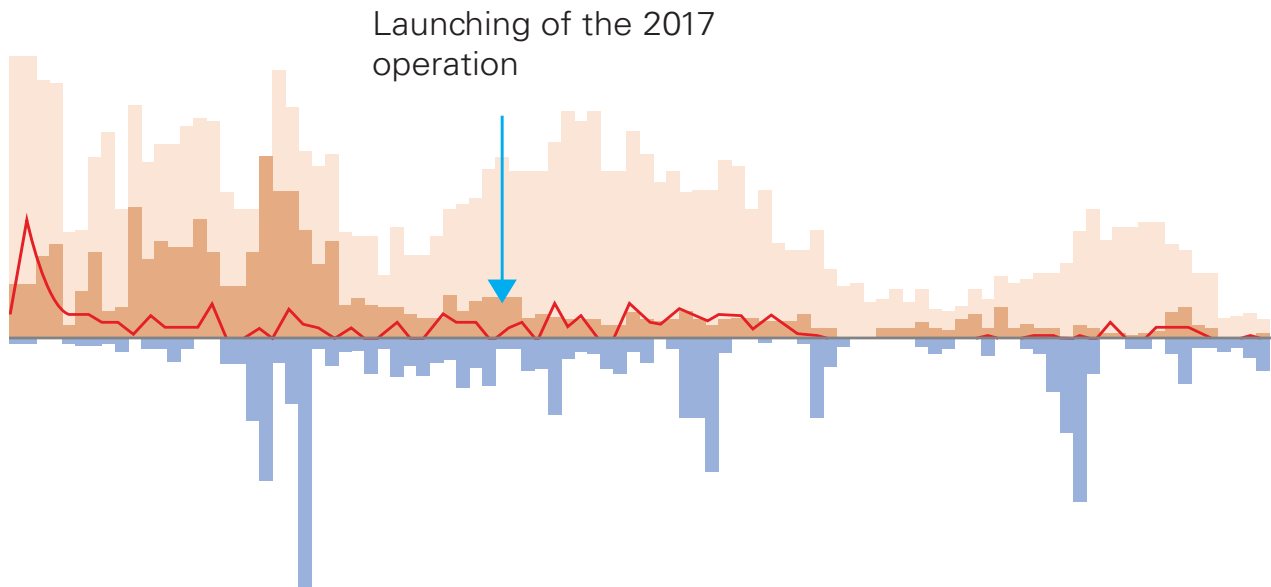
More evidence of the impact of the OCP is demonstrated by the trends in suspected cholera cases and rainfall for the country as a whole and for the West department (see *Figure 12*). The dark orange bars represent the number of cases in the West department, and the light orange bars represent the number of cases nationally. Before the OCP, the West department usually accounted for 30 per cent to

50 per cent of all cases.<sup>78</sup> Due to the OCP, the West department accounted for less than 10 per cent of all cases, reducing the risk of a national outbreak, as this locality is the most populated area and main intersection in Haiti. It is also interesting to note that rainfall did not systematically result in an increase in cholera incidences.

<sup>77</sup> UNICEF (2017b)

<sup>78</sup> Except in mid-2014 due to a severe surveillance default in this department (i.e., cases were not being reported following Hurricane Matthew in the southern peninsula).

**Figure 12.**  
**Trend of suspected cholera cases, with national and West department rainfall, Haiti, 2017**  
**(2017w1–2017w42)<sup>79</sup>**



**Source.** UNICEF (2017b)

Another quick analysis was conducted in the North-West department in 2018, which compared the number of suspected cholera cases with the number of RRTs, response times and rainfall data. This covered a 20-week period, from January to May 2018 (2018w1–2018w20).<sup>80</sup> A chronological summary of the response provides insights into how the response was scaled up as follows:

- Before 2018w15, there was one team in one vehicle, alongside one member of EMIRA staff and other EMIRA staff responding independently.
- Between 2018w15 and 2018w16, there were two teams in two vehicles and two EMIRA staff working alone in remote areas.
- During 2018w17, there were two teams in two vehicles, one extra team with back-up staff, and two members of EMIRA staff alone in remote areas. The response time was delayed due to localized flooding.
- From 2018w19, there were five teams in five vehicles,<sup>81</sup> with the integration of five EMIRA staff in each team. Staff of NGOs were deployed in remote areas, with EMIRA and six community-based agents mobilized in the two most affected remote areas.
- At this point, the response included an increased size of 'cordon sanitaire' from 10–20 houses to 20–30 houses and an increased number of interventions within 24 hours.<sup>82</sup>

<sup>79</sup> Note that 2018w42 data are incomplete.

<sup>80</sup> UNICEF (2018d)

<sup>81</sup> An additional two teams were provided by the Artibonite department, based on the geographic flexibility agreement between UNICEF, MSPP and NGOs.

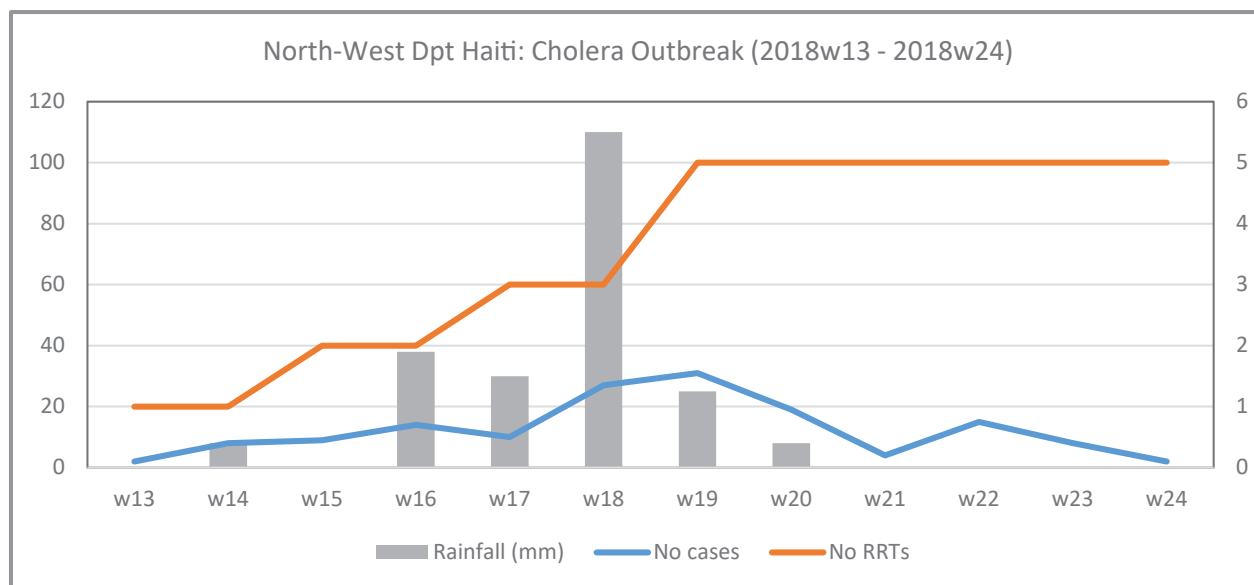
<sup>82</sup> Same-day notification was ongoing, based on the placing of four agents inside treatment institutions, directly reporting to RRTs new-case arrivals.



The analysis of the 12-week period from March to June 2018 (2018w13–2018w24) illustrates:

- the correlation between an increase in the number of RRTs deployed, a decrease in suspected cases and rainfall patterns (see Figure 13).<sup>83</sup>
- the correlation between an increase in the RRT response rate and a decrease in suspected cases (see Figure 14).

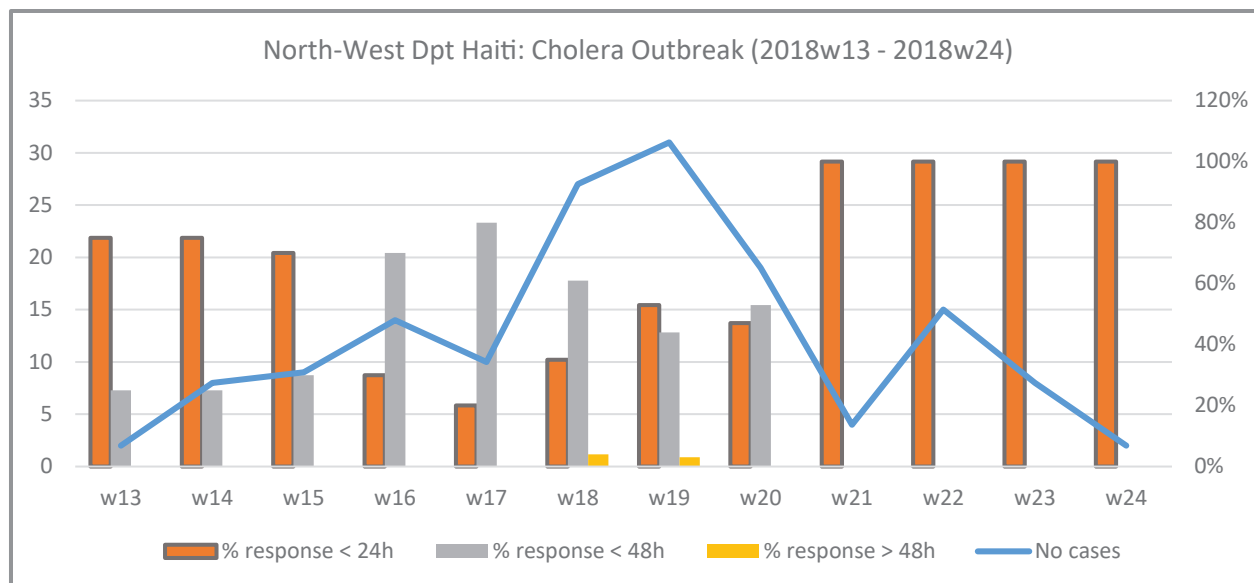
**Figure 13.**  
**Trend of suspected cholera cases compared with numbers of RRTs and rainfall, North-West department in Haiti, 2018 (2018w13–2018w24)**



Source. UNICEF (2018d)

<sup>83</sup> Despite a correlation with a decrease in rainfall, the assumption is that a heavy rainfall of 110mm, causing localized flooding, should have resulted in a greater rate of disease transmission. On the contrary, the trend shows a 'slowing down' the week following this rain and a clear decrease the week after.

**Figure 14.**  
**Trend of suspected cholera cases compared with RRT response time, North-West department in Haiti, 2018 (2018w13–2018w24)**



**Source.** UNICEF (2018d)

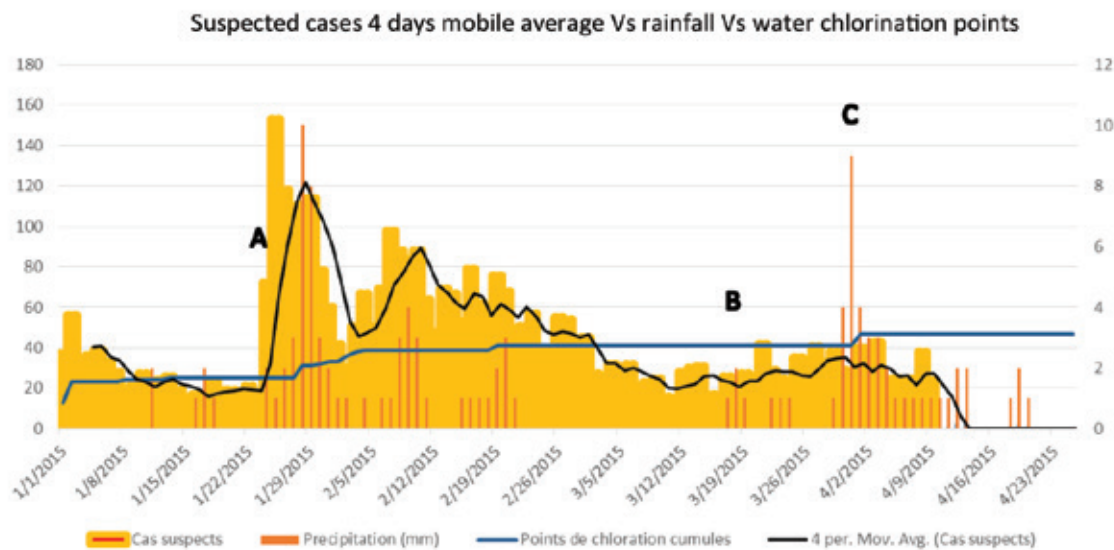
There was another review conducted of the ‘quick impact’ of the emergency preventive response on cholera incidence and control in the metropolitan area of Port-au-Prince.<sup>84</sup> This covered a 17-week period, from January to April 2015 (2015w1–2015w17). This review correlated the possible relationship between rainfall, cholera incidence and the number of water chlorination points in Port-au-Prince (see *Figures 15 and 16*).<sup>85</sup> As access to chlorinated

water points increased over time (from 20 to 45), there was a reported decrease or slowing down’ of cases, which is likely to have been influenced by this increase. These findings are useful and help to further demonstrate the effectiveness and impact of RRT interventions, which include water treatment, despite not being directly mentioned in the review document.

84 UNICEF (2015)

85 This also included a similar analysis that included distribution of Aquatabs, instead of water chlorination points.

**Figure 15.**  
Suspected cases, rainfall and water chlorination points, Port-au-Prince, Haiti, 2015 (2015w1–2015w17)<sup>86</sup>



Source. UNICEF (2015)

**Figure 16.**  
Comparative mapping of cholera cases in the Port-au-Prince metropolitan area, Haiti (27 January and 1 April 2015)



Picture 1: Repartition of suspected cases of cholera in Martissant and Carrefour areas on outbreak peak day (27th January 2015) with 69 cases on this single day.



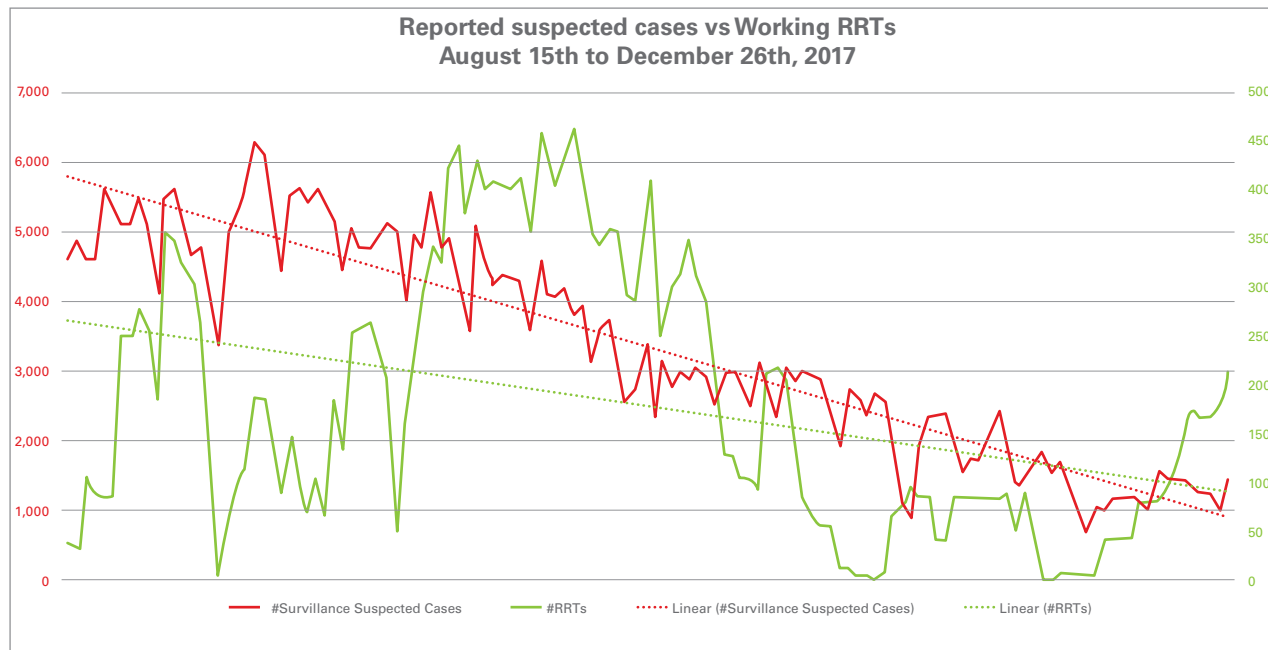
Picture 2: Repartition of suspected cases of cholera in Martissant and Carrefour areas on outbreak peak day following the rains in March (10 cases) against water chlorination points installed in both areas (yellow points).

Source. UNICEF (2015)

<sup>86</sup> There is evidence showing that short and small rains (A) in January generated the contamination of water systems and the transmission of the disease to hundreds of people in few days, while, with a similar rainfall pattern in April (B), there has been only a slight increase, rapidly followed by a reduction in daily suspected cases. The graph quite explicitly shows that with an increased number of chlorination points in Martissant and its surroundings (as well as the complete response package), and despite a period of rains at the end of March and heavy rains at the beginning of April (C), cholera has been controlled in this zone of the Port-au-Prince metropolitan area.



**Figure 18.**  
**Extraction of reported cholera cases and evolution of RRT coverage,**  
**Yemen (2017w33–2017w52)**

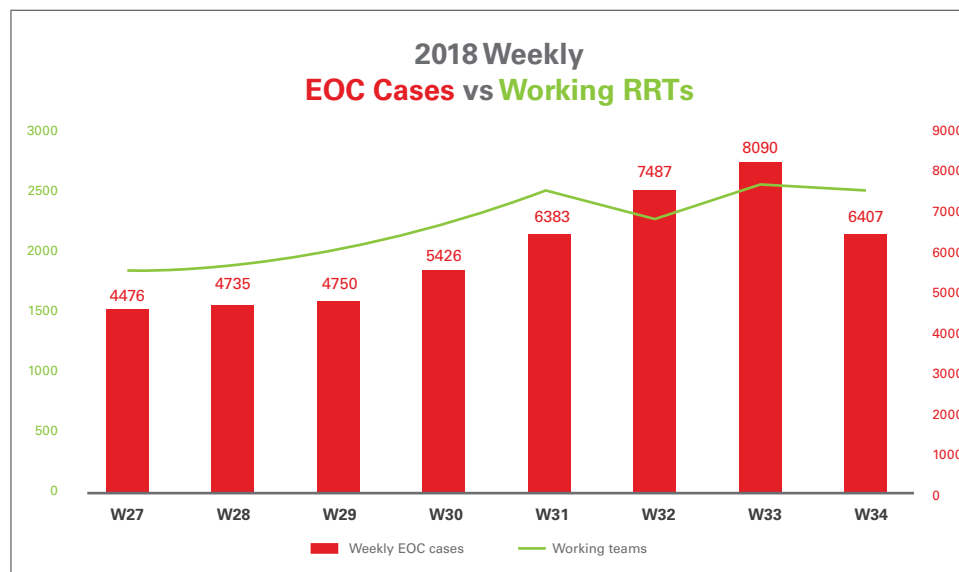


**Source.** GARWSP (2018d)

Another, more specific example has been provided by GARWSP based on findings from July and August 2018. This review covered an eight-week period, from 2 July to 26 August 2018 (2018w27–2018w34).<sup>89</sup> It studied the possible relationship between the number of working RRTs and cholera incidence, along with rainfall data. It showed that for the first period (which had low rainfall), an increase in the number of working RRTs resulted in fewer cases (2018w27–2018w34) (*see Figure 19*). As rainfall

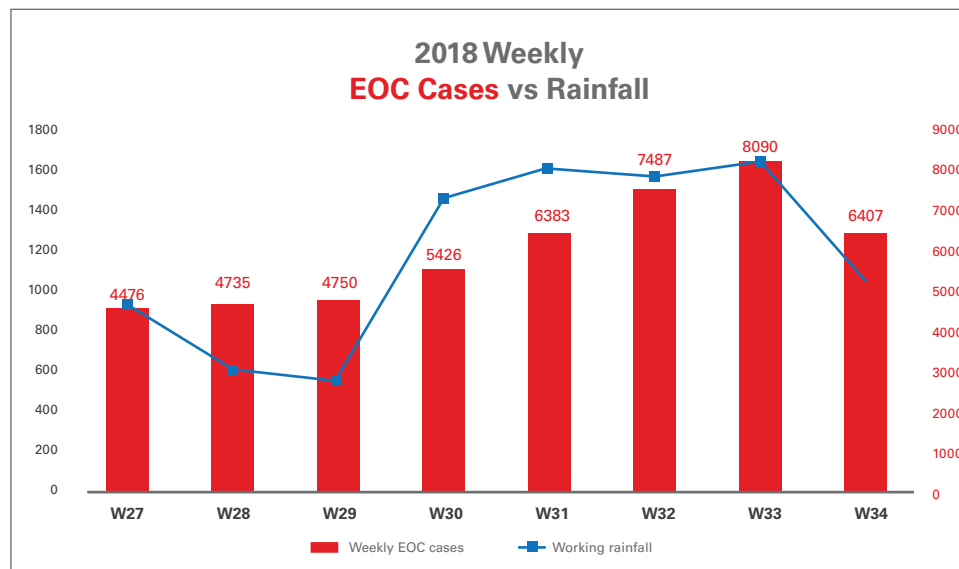
starts to increase (2018w30), there is an increase in cases and fluctuations in the number of working RRTs. With a new decrease in rainfall and stabilization of working RRTs, there is a noted decrease in the number of cases (2018w33–2018w34) (*see Figure 20*).<sup>86</sup> This demonstrates the potential influence that RRT interventions can have on the cholera incidence. Further analysis is required over a longer period to better understand the potential correlation, along with rainfall patterns.

**Figure 19.**  
Correlation between EOC cases and working RRTs, Yemen, 2018 (2018w27–2018w34)



Source. GARWSP (2018a)

**Figure 20.**  
Correlation between EOC cases and rainfall, Yemen, 2018 (2018w27–2018w34)



Source. GARWSP (2018a)

## Post-intervention monitoring

### Haiti

Since 2017, frequent PIM, measuring both quantitative and qualitative aspects of interventions,<sup>90</sup> has been in place.<sup>91</sup> The key findings are based on an analysis of PIM data collected by three NGOs between April and August 2018 from 403 households, of which 22 per cent had suspected cases of cholera and 78 per cent were within the cordon sanitaire. Data obtained from the four districts of Ouest, Artibonite, Centre and Sud highlights that:<sup>92</sup>

- For household visits, 91 per cent of households reported being visited by the RRT, with 75 per cent of those being disinfected.
- For distributed items, 96 per cent of households received ORS, 95 per cent received water-treatment products, 62 per cent received soap, 55 per cent received IEC materials, 40 per cent received medicine and 12 per cent received a water container (i.e., a bucket). Note that for ORS and water-treatment products, more households reported receiving these items than were visited. This could be due to re-distribution between neighbouring households, items received outside the household during a hygiene awareness session, or misunderstanding of the question.
- For Household Water Treatment and Storage (HWTS), 93 per cent of households reported chlorination of drinking water as a direct result of the RRT intervention, with 75 per cent of households having a detectable presence of FRC. However, only 60 per cent of those were within the acceptable range for FRC of 0.3 mg/l to 1.0 mg/l, representing 42 per cent of all households sampled.
- For key hygiene knowledge and practice, 96 per cent of individuals who were sampled recalled hand washing before eating, and 95 per cent recalled hand washing after defecation. However, only 48 per cent could name three critical times for hand washing: 50 per cent recalled before food preparation, followed by 32 per cent after cleaning a child's bottom. Additionally, of the households sampled, only 42 per cent had available

hand washing with soap and water; while 57 per cent only had soap available and 58 per cent only had water available, demonstrating the difference between knowledge of hygiene and practice.

- For beneficiary satisfaction, 99 per cent of households were satisfied with the key messages received on cholera, along with the items distributed to support good hygiene practice. Additionally, households felt that the key messages received were clear in most of the cases (i.e., 99 per cent for hand washing, 99 per cent for water treatment, 98 per cent for food handling, 84 per cent for sanitation and 61 per cent for funerals).

### Yemen

Since the establishment of the RRTs, the model reached 2,323,265 households between 15 August 2017 and 21 October 2018.<sup>93</sup> Cumulative information on RRT interventions includes the distribution of 104,862 jerry cans, 3,683,941 bars of soap, 1,644,981 hygiene kits and 11,013,397 chlorine tablets.<sup>94</sup> While PIM is reported as being conducted regularly, there are no reports to document the effectiveness and impact of these interventions. The key findings of a TPM report, covering the period of 14 May to 1 June 2018, based on 174 households in 11 districts of five governorates, highlight that:<sup>95</sup>

- An average of 91 per cent of households had been visited within the past week, with most reporting either having experienced or witnessed a case of acute water diarrhoea (AWD) in the previous two-week period.
- Households were visited by configuration of RRTs, including 7 per cent of households with one volunteer (male),<sup>96</sup> 0 per cent of households with one volunteer (female), 59 per cent of households with two volunteers (male and female), 21 per cent of households with two volunteers (male) and 13 per cent of households with two volunteers (female).

90 Before 2017, this focused mainly on quantitative aspects of implemented activities.

91 This includes timing and geographic targeting, the number of people reached, methodology of education sessions and the quantity of distributed water-treatment products, as well as their impact on hand washing, defecation and water-treatment practices.

92 UNICEF (2018f)

93 Also note that as of 31 August 2018, there had been a reported 1,159,448 cases of cholera, with 2,407 deaths, in the country since October 2016. GARWSP (2018c)

94 This includes 750,629 households; 8,076 jerry cans; 430,146 bars of soap; 632,773 hygiene kits and 3,524,324 chlorine tablets (15 August–31 December 2017) and 1,572,636 households; 96,786 jerry cans; 3,253,795 bars of soap; 1,012,208 hygiene kits; and 7,489,073 chlorine tablets (1 January–21 October 2018). GARWSP (2017; 2018)

95 UNICEF (2018g)

96 There was recognition that visits by males only could hinder access to households, particularly in rural areas.

- The time spent at households was less than 10 minutes for 33 per cent and for most, it was more than 10 minutes.
- An analysis of the retention of five key messages and demonstration of these was conducted, including 36 per cent of those interviewed on HWTS, 36 per cent on hand washing at critical times, 15 per cent on proper food handling, 7 per cent on cholera symptoms, and 5 per cent on modes of transmission. Overall, none of those interviewed was able to recall any of the five key messages provided by the RRTs. Despite there being variations in the key messages that were recalled more than others (i.e., modes of transmission for cholera were less recalled than the other key messages).
- Soap and washing detergent were the most used items (99 per cent and 90 per cent on average, respectively), followed by 80 per cent for Aquatabs. The reported use of IEC materials distributed was quite low, at 9 per cent.
- 74 per cent of households could explain or demonstrate how to use chlorine tablets (0.33 mg/l). Out of the 70 per cent of households that had chlorine tablets available at home, only 23 per cent were able to explain or demonstrate their use.
- 86 per cent of households had handwashing facilities, and 67 per cent of those had soap near the facility.
- 82 per cent of households were able to explain how to prepare ready-made ORS and 16 per cent were able to explain the preparation of home-made ORS.
- 91 per cent of households expressed satisfaction with the services provided by RRTs.

## RRTs' response: Timely, coordinated and predictable

The review also aimed to better understand perceptions of the ability of different types of teams and models to provide a timely, coordinated and predictable response

from those directly involved in their implementation (see *Table 4*).

**Table 4.**  
Timely, coordinated and predictable responses

	Haiti	Nigeria	South Sudan	Yemen
Parameters	<i>RRTs</i>	<i>RRM (WASH component)</i>	<i>WASH EP&amp;R</i>	<i>RRTs</i>
Timely	Most	All	All	Most
Coordinated	Most	All	All	Most
Predictable	Most	All	All	All

There were mixed responses about the ability of the RRT model to provide a **timely** response, ranging from all key informants considering this to be the case in **Nigeria and South Sudan**, and with most considering this to be the case in **Haiti and Yemen**. These responses were based on the view that while having all the required resources in place, including human and financial, materials and supplies, coordination and information structure, to ensure a response by RRTs (i.e., within 24 to 48 hours), this is only somewhat timely. It was also highlighted that embedding the RRT model into a government structure, such as MSPP, DINEAP and/or GARWSP, further increases accountability of the response. There were concerns reported with not always being able to reach the indicator

for the response time of 48 hours due to security constraints and access issues related to the geographic area covered and remoteness of locations. Additionally, the use of timeliness as an indicator for the response requires improved data collection and analysis of implemented activities, along with the quality of data and timeliness of information-sharing between health and WASH actors.

Questions about the ability of the RRT model to provide a **coordinated** response also produced mixed results, ranging from all key informants considering this to be the case in **Nigeria and South Sudan** and most considering this to be the case in **Haiti and Yemen**. These responses were based on the view that while the RRT model



provides the framework required to support a response, this is only somewhat coordinated, despite having a harmonized, joint approach in its terms of reference, SOP, guidelines, protocols and training.<sup>97</sup> It was recognized that the harmonized, joint approach only functions well with clearly defined roles and responsibilities for all actors, particularly at centralized levels, along with accountability. Coordination is recognized as complex and reliant on various stakeholders, and the availability of good-quality, reliable and timely epidemiological data and line lists. It was recognized that the presence of RRT models that work closely with existing coordination mechanisms, as in the case of the WASH EP&R and WASH cluster in **South Sudan**, plays a pivotal role because this centralizes all alerts and promotes rapid decision-making for the activation and deployment of teams.

There were also mixed responses about the ability of the RRT model to provide a **predictable** response, ranging

from all key informants considering this to be the case in **Nigeria, South Sudan and Yemen**, and most considering this to be the case in **Haiti**. These responses were based on the view that the design of the RRT model is based on a standard package of assistance that aims to ensure the same quality, through similar delivery mechanisms, in different locations, noting that the variability of response times was due to constraints already cited above. It also optimizes the combination of pre-positioning of materials and supplies, as well as well-trained and dedicated staff from government partners and/or NGOs to ensure a systematic response across different stakeholders in different locations. This model is constantly evolving and requires more focus to ensure the provision of a consistent and effective response. It was also cited that the model itself is considered reliable, as has been reported as key in establishing the credibility of the effectiveness and impact by the WASH sector on cholera, particularly in **Haiti and Yemen**.

## RRT model: Replication

To support the replication of RRTs in different countries and contexts, particularly in outbreak settings, it is important to note the key factors required to create an enabling environment for the RRTs in **Haiti, Nigeria, South Sudan and Yemen**. The most significant factors include:

- Interest and willingness among national and local authorities is required to ensure an effective response and facilitates systematic adherence to the comprehensive alert-response strategy, further reinforcing information-sharing, coordination and accountability.
- Strong coordination between stakeholders, including national and local level authorities, coordination mechanisms, such as the Health and WASH Cluster, and community leaders, facilitates timely information management and sharing.
- 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.
- Early detection at the beginning of an outbreak and prompt use of RRTs plays a critical role in avoiding further spread of the disease, and is further reinforced through the support and leadership of national authorities.

- Availability of well-trained personnel in multi-sectoral teams, that include health, WASH and 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 hot-spots.
- Availability of materials and supplies, logistics support, and pre-positioning of items in secure and space-efficient warehouses, is required to support timeliness of interventions.
- Predictable, flexible and timely funding is essential for the RRTs and should be sustained over time. Contingency funding established with donors through a national mechanism for emergency funding is required in the absence of permanent funding sources.

While it is difficult to predict a timeline for the establishment and implementation of the RRT model, it is possible to put forward a phased approach based on the experience in **Haiti, South Sudan and Yemen**. In all these countries, this occurred over a three- to four-month period,<sup>98</sup> with recognition that the process occurs more fluidly when conducted during the preparedness stage rather than during an outbreak. The key operational milestones have been outlined (see Table 5).

<sup>97</sup> It is important to note that there are different levels of coordination and stakeholders involved. This includes government partners, UNICEF and NGOs.

<sup>98</sup> In Haiti, this occurred over two months, starting in June 2013; in South Sudan, this occurred over a three- to four-month period, starting in January 2018; in Yemen, this occurred over a period of two and a half months.

**Table 5.**  
**Phased approach and operational milestones**

Phased approach	Operational milestones
0–15 days	Development of agreements with government partners and NGOs.
15 days–1 month	Establishment of teams; procurement of materials and supplies; draft 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.
2 months and beyond	Monitoring of RRTs, adapted based on the context and evolution of the outbreak.
3 and 6 months	Real-time evaluation of RRTs; capitalization of challenges faced, best practice, and lessons learned.

To support the monitoring of the RRT model, it is important that KPIs are also taken into consideration (*see Table 6*).

**Table 6.**  
**KPIs for RRTs, Haiti and Yemen**

Indicators	Description
Number of cases responded to per day	Total number of teams required to support the overall mechanism. Based on an estimate of the number of cases that the RRTs can realistically cover in a 24-hour period.
Response effect	Use of a robust surveillance system (based on a well-defined alert-response strategy) to conduct a comparative analysis between alerts and suspected cases (based on the epidemiological data and line lists) versus completed interventions to better understand the ability of RRTs to control localized outbreaks. Measurement of alerts from community cases should also be factored in.
Response time	Based on the time it takes from the alert being triggered to the activation, deployment and response of the teams. This is recommended to be measured within 24 hours and within 48 hours. <sup>65</sup>
Response coverage	Based on the identified risk, which has been proven to be within 50- to 100-metres radius of a confirmed case. This is defined as the 'cordon sanitaire' and is defined by the perimeter of houses with higher probability of having been in contact with the affected household(s). <sup>65</sup> This should be further defined for urban and rural settings, based on population density and results of the immediate outbreak investigations.
Cost-efficiency	Monthly analysis of RRT interventions by the number of affected and at-risk households, along with a comparison of the cost for different types of models (i.e., government led, NGO led, 'mixed-teams') and settings (i.e., urban, rural). This should also include analysis of the costs associated with standby teams. <sup>99</sup>

99 It is important to clarify that, at times, the RRT model may be costly as the design is based on the life-saving efforts of reaching containment and control of a cholera outbreak, not cost-efficiency.





# Conclusion

The RRT model has demonstrated that it is an indispensable mechanism in supporting cholera response and prevention activities in the different countries where it has been used. Through the systematic use of surveillance systems and available epidemiological data, RRTs target affected households and at-risk populations in the community. Through early detection at the beginning of an outbreak and the prompt use of RRTs plays a critical role in avoiding further spread of the disease. The RRT model is evidence-based and provides an integrated and harmonized package that specifically targets pathways for cholera transmission.

RRT interventions focus on changing or improving the key behaviours that are considered most effective, based on evidence, including: the use of safe drinking water, safe defecation practices, handwashing with soap at critical times, and best practice in food preparation and handling. The capacity of RRTs to provide these interventions within 24 to 48 hours and targeting a perimeter of 50- to 100-metres radius around the affected household adds to the ability of the model to contribute towards reducing cholera transmission in outbreak settings. It is essential

to reducing the spread of cholera and the risks to affected and at-risk populations. RRT interventions provide an immediate and timely response, with the potential to reduce and/or 'slow down' transmission. The knowledge gaps associated with measuring the effectiveness and impact of RRTs are recognized as an area for future action.

The RRT model is embedded in 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. Strong interest and the willingness of national and local authorities to support a comprehensive alert-response strategy create the enabling environment for information management, timely information-sharing and coordination that further support the model. The RRT model can be sustained when it is incorporated and supported by national control and elimination programs that focus on broader public health measures, such as community-based initiatives, with support and leadership from national authorities.

# Recommendations

This review aimed to provide operational recommendations on key findings, programmatic learning and best practice in the RRT model, including specific guidance for outbreak settings. To support the replication of RRT models, the development of an operational guideline for

different settings and contexts is strongly recommended. This should include tools and resources to support design, implementation, training and capacity-building, data collection, analysis and reporting, and M&E (*see Table 7*).

**Table 7.**  
**Priority operational recommendations for RRTs**

Recommendations	Actions	Considerations
<i>Strengthening of coordination between all stakeholders</i>	<ul style="list-style-type: none"> <li>Put in place a working modality to systematically link interventions with the overall coordination of the response through platforms such as the WASH cluster.</li> <li>Conduct regular mapping interventions against current responses by WASH partners.</li> <li>Provide a comparative analysis of RRT interventions and the overall response by WASH and health partners.</li> </ul>	<ul style="list-style-type: none"> <li>Strengthen coordination between the health and WASH sectors; should be supported at a high level.</li> <li>Recognize the importance of ensuring that RRT interventions are connected to broader preventive measures.</li> <li>For countries with an active cluster coordination mechanism in place, ensure that ways of working, roles and responsibilities, are well-defined and measurable.</li> </ul>
<i>Comprehensive alert-response strategy</i>	<ul style="list-style-type: none"> <li>Develop a comprehensive alert-response strategy, which includes the RRT model as one of the key components. The criterion for the activation and deployment of RRTs should clearly demonstrate information-sharing and decision-making for monitoring and accountability purposes.</li> <li>Put in place a WASH-based surveillance system<sup>100</sup> to complement the existing health surveillance system, and to ensure that all cases of cholera are responded to (i.e., institutional and community-based cases).</li> </ul>	<ul style="list-style-type: none"> <li>Recognize that the RRT model is part of a broader, holistic and multi-sectoral strategy to support cholera control and elimination. This requires contributions and collaboration from all sectors and stakeholders in the design, implementation and monitoring.</li> <li>Through early detection at the beginning of an outbreak and the prompt use of RRTs plays a critical role in avoiding further spread of the disease.</li> <li>Establish priorities on the basis of evidence (i.e., epidemiological and rainfall data).</li> <li>Recognize the importance of ensuring that community-based alerts are also well incorporated into the strategy.</li> </ul>

<sup>100</sup> This could include formalization of the use of community-based structures that can contribute to triggering alerts and information-sharing (somewhat similar to the model in Haiti with the multi-sectoral community health workers). It can also support the establishment and/or strengthening of water quality monitoring and surveillance (as a proxy indicator to identify potential risks for cholera transmission). This system usually already exists and is embedded with the MoH, but requires additional resources to ensure its systematic implementation. This too can contribute to triggering alerts and information-sharing.

Recommendations	Actions	Considerations
<i>Strong and timely information management and sharing</i>	<ul style="list-style-type: none"> <li>Establish a robust surveillance system and timely sharing of epidemiological data and line lists, based on a well-defined alert system. Use of rainfall data should be included.</li> <li>Establish well-documented SOP, guidelines and/or protocols that consider mitigation measures for issues associated with the accuracy or availability of epidemiological data and line lists.</li> </ul>	<ul style="list-style-type: none"> <li>Consider the critical nature of high-level political support at the national level, as well as at the local level to create the enabling environment for information-sharing, coordination and accountability.</li> <li>Provide technical support as required, through the secondment of technical experts.</li> </ul>
<i>Multi-sectoral RRTs</i>	<ul style="list-style-type: none"> <li>Establish multi-disciplinary teams that draw on resources from the health, WASH and C4D sectors, along with government partners and NGOs.</li> <li>Provide training based on a harmonized package that includes refresher courses and a simulation exercise.</li> <li>Make pre-positioned materials and supplies available to increase the timeliness of responses.</li> <li>Consider mitigation measures for security and/or seasonal constraints.</li> </ul>	<ul style="list-style-type: none"> <li>Establishment of multi-sectoral teams should be embedded into government structures. Support and leadership should be provided by national authorities.</li> <li>Select locations for the pre-positioning of teams, materials and supplies, should be evidence-based (i.e., epidemiological and rainfall data).</li> <li>Ensure good coordination with all relevant stakeholders, including any other RRM or EP&amp;R in place in the country.</li> </ul>
<i>Systematic inclusion and scaling up of C4D</i>	<ul style="list-style-type: none"> <li>Implement a comprehensive C4D package. Increase focus on key messages that are tailored for specific target groups and delivered through appropriate communication channels.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct operational research or formative studies on the effectiveness and impact of scaling up C4D on behaviour change and improvements related to cholera transmission.<sup>101</sup></li> </ul>

101 As not enough evidence-based analysis has been conducted, an overall transmission study has been advised for the purpose of the prevention of cholera (not just that of rapid response). However, it is important to note the challenges related to the scope and size of the type of study required, as there are in-country limitations to conducting such assessments, coupled with security and access constraints.

Recommendations	Actions	Considerations
<p><i>Systematic monitoring and evaluation framework</i></p>	<ul style="list-style-type: none"> <li>• Develop a harmonized log frame with KPIs that can measure the effectiveness and impact of RRT interventions.</li> <li>• Establish a protocol to support the harmonization of data collection, analysis and reporting based on a standard methodology and tools.</li> <li>• Regularly analysis of the correlation of cholera incidence, the number of teams, presence and coverage of interventions, and rainfall data (i.e., weekly, monthly and cumulatively). Include contributing factors such as access or security constraints.</li> <li>• PIM of RRT interventions should be systematically measured using a standard methodology and tools. Frequency should be defined to better correlate completed interventions and repeated cholera incidence. Suggested intervals are two weeks, one month, and three months after an intervention.</li> </ul>	<ul style="list-style-type: none"> <li>• The M&amp;E framework needs to ensure systematic measurement to articulate the effectiveness and impact of RRT interventions on reducing the cholera incidence and transmission.</li> <li>• The framework should also be able to measure and demonstrate the optimization of the cost-efficiency of the RRT model in different settings (e.g., urban and rural, by population density).</li> <li>• Recognize that the framework should be comprehensive and include all data and information from activity reports, PIM reports, and capitalization and lessons learned exercises, etc.</li> <li>• Trend analysis should be regularly conducted, based on a comprehensive analysis of the evolution of the outbreak correlated against the response strategy, including RRTs, to better understand how to adapt and improve the response.</li> </ul>
<p><i>Standardized capitalization and programmatic learning</i></p>	<ul style="list-style-type: none"> <li>• Establish a standard methodology and tools to harmonize capitalization and lessons learned exercises (i.e., quarterly, biannually and annually).</li> <li>• Conduct regular in-country exercises to document programmatic learning. This should be disseminated via online platforms, in-country workshops, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure alignment with the M&amp;E framework.</li> <li>• Ensure that all documentation demonstrates how lessons learned have been (or have not been) incorporated into future responses.</li> <li>• Conduct a meta-analysis of all programmatic learning to demonstrate the incorporation of lessons learned into future responses.</li> </ul>
<p><i>Sustainability and long-term measures</i></p>	<ul style="list-style-type: none"> <li>• Incorporate the RRT model into national control and elimination programs that focus on broader public health measures.</li> <li>• Potential to use of RRTs in a low-transmission context, to avoid a resurgence of the disease where conditions are prone to recurrent cholera outbreaks.</li> <li>• Advocate for resource mobilization from the donor community based on long-term elimination and control efforts.</li> </ul>	<ul style="list-style-type: none"> <li>• The RRT model should be embedded into government structures, led by national authorities.</li> <li>• The RRT model should be embedded into a country's multi-sectoral national control plan (NCP) for cholera control and elimination.</li> </ul>



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# Annexes

## Annex 1. Terms of reference

### Background and rationale

The rapid response mechanism (RRM) is an operational, programmatic and partnership model designed to enhance the humanitarian community's capacity to respond in a timely, coordinated and predictable manner to the needs of populations made vulnerable by conflict, displacement, disease and/or natural disasters in humanitarian settings. Through the RRM, UNICEF and its partners provide critical multi-sectoral emergency response in a wide range of sectors, including nutrition, WASH, non-food items, health, education and protection.

In 2017, UNICEF's Office of Emergency Programs (EMOPS) carried out an internal review of the RRM. The purpose of this review was to provide UNICEF practitioners with historical and current information regarding RRM globally, as well as to capture lessons learned and best practice from RRM practitioners at the country, regional and headquarters level.

In parallel, in recent outbreaks, the use of WASH rapid response teams (RRTs) has increased. RRTs have been used as part of cholera responses in Haiti, Yemen, Somalia, Sudan, the Democratic Republic of the Congo and other countries. The scope of these teams varies widely across countries. As RRTs become more commonly used in outbreak settings, it is important to document them better to map when and how they are used.

Through this consultancy, UNICEF would like to further map the WASH-related aspects of RRM and RRTs. A specific focus to be explored is how RRM and RRTs are used in outbreak settings.

### Purpose

The purpose of the WASH RRT review is to:

- map all WASH RRT interventions supported by UNICEF
- map other WASH RRT interventions supported by WASH sector partners (government partners, NGOs, UN agencies etc.)
- detail and compare different RRT structures and scopes
- make recommendations on RRT best practice
- develop case studies for all WASH RRM/RRTs involved in outbreak settings

### Activities

- Review relevant general RRM/RRT background documents.
- Design a methodology for the review of WASH components of RRM/RRTs, by:
  - developing a review methodology and report structure
  - collecting, organizing and reviewing all documents related to WASH RRM/RRT
  - identifying and interviewing key stakeholders.
- Write a report describing the scope, response criteria, average response time, interventions, resource requirements (financial and human resources), staffing structure, type of training given to RRT staff, type of partnerships with implementing partners, type of coordination structures, exit strategies and challenges faces by different WASH RRTs.
- Develop case studies for each RRM/RRT involved in outbreak settings (Haiti, Democratic Republic of the Congo, Somalia and Yemen, among others).
- Make recommendations on RRT best practice and in which context these are an appropriate programmatic solution.
- Present the report and the case studies to UNICEF's New York headquarters (face to face) and at regional offices, country offices and partners (via web seminar).

## Annex 2. List of key informants and resource focal points

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