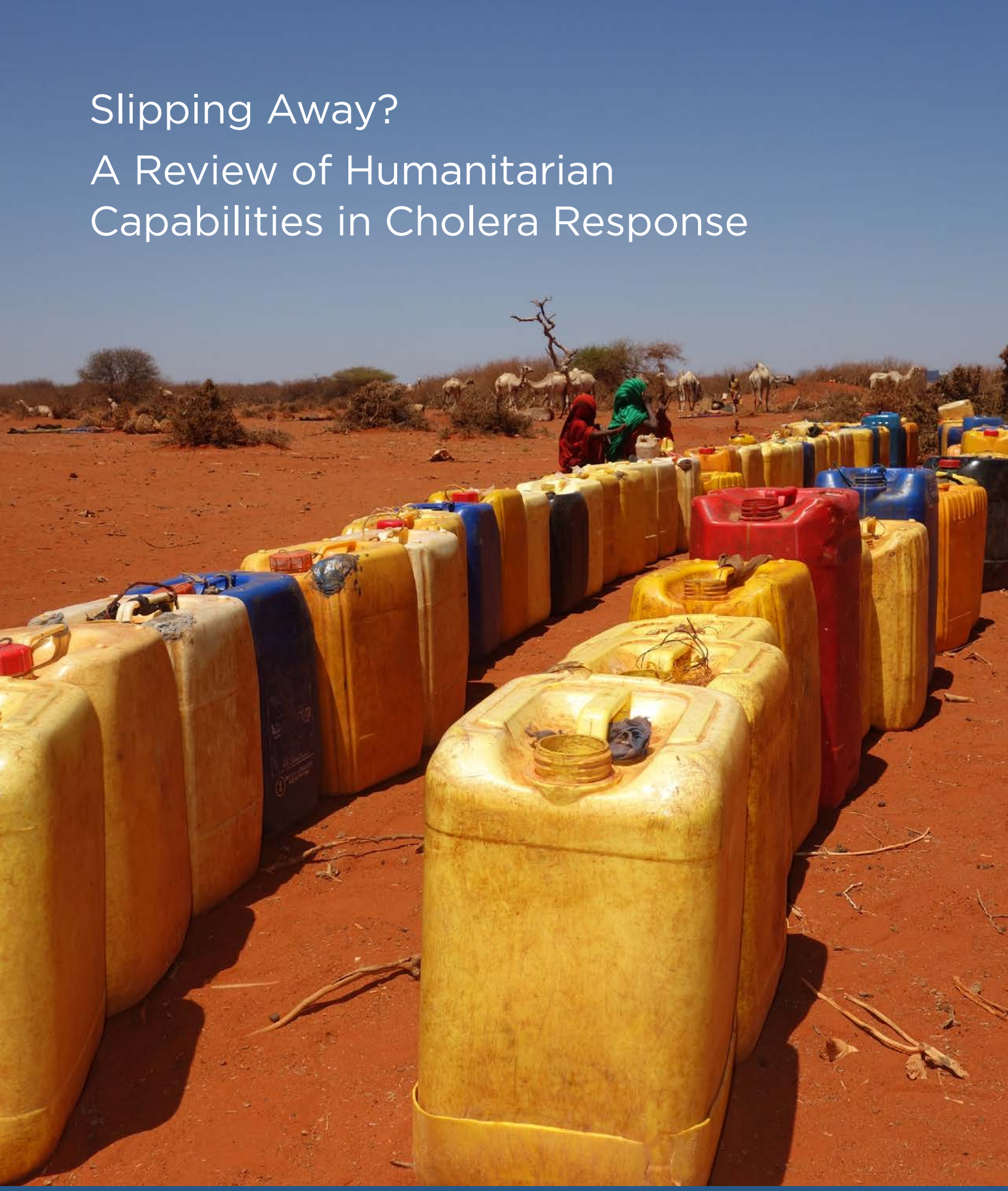
Slipping Away?

A Review of Humanitarian Capabilities in Cholera Response



United Kingdom Humanitarian Innovation Hub

Humanitarian Outcomes

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A Review of Humanitarian Capabilities in Cholera Response

February 2023

This report is the third in a series of rapid reviews conducted by Humanitarian Outcomes under the Humanitarian Rapid Research Initiative (HRRI), commissioned and supported by the UK Humanitarian Innovation Hub with UK aid from the Foreign, Commonwealth & Development Office. The rapid review took place in December 2022 and January 2023. The research encompassed interviews with 64 informants from global and country-level humanitarian and public health entities and donor governments, a systematic meta-review of 121 journal articles relating to cholera in humanitarian settings and analysis of relevant data and general literature.

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Cholera case and fatality data used in this report is from the publicly available dataset reflecting cases officially reported to the World Health Organization (WHO) by member states 2000–2021. For case data from 2022, not yet included in the public dataset, we drew from the WHO Global Cholera Situation Report published on December 16, 2022. We were unable to confirm details of the methodology behind the WHO cholera case data collection.

Acronyms

CATI	case-area targeted intervention
CCA	common country assessment
CEPI	Coalition for Epidemic Preparedness Innovations
CERF	Central Emergency Response Fund
DRC	Democratic Republic of Congo
FTS	Financial Tracking Service
GOARN	Global Outbreak Alert and Response Network
GTFCC	Global Task Force on Cholera Control
HNO	humanitarian needs overview
HRP	humanitarian response plan
IFRC	International Federation of Red Cross and Red Crescent Societies
IMS	Incident Management System
MSF	Médecins sans Frontières
OCHA	UN Office for the Coordination of Humanitarian Affairs
OCV	oral cholera vaccine
ORS	oral rehydration solution
ORT	oral rehydration therapy
RCCE	risk communication and community engagement
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
WASH	water, sanitation, and hygiene
WHO	World Health Organization

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Summary

Over the past two years there has been a notable uptick in cholera outbreaks and deaths. The greater number of countries experiencing cases, combined with an unusual geographical distribution of outbreaks and unacceptably high case fatality rates, has raised concerns about the global capacity for cholera response and control, and whether some past progress has been lost.

A deadly but relatively easy disease to treat if caught in time – and one that often occurs within the context of a broader emergency – cholera has long been considered a basic staple of core humanitarian business. It was a disastrous performance in response to a cholera outbreak among Rwandan refugees in Goma in 1994 that shook and subsequently reshaped the modern humanitarian system, establishing standards, operational guidance, and coordination structures meant to better enable rapid and effective life-saving response. Three decades later, what is going wrong?

While cholera outbreaks can have multiple contributing factors – including armed conflict, development and governance failures, and the effects of climate change – these lie largely outside the influence of humanitarian actors. While not discounting the broader issues, such as lack of investment in water and sanitation infrastructure and other more sustainable solutions, this rapid review focuses on the response element – the humanitarian capacities, competencies, and coordination.

Current situation: Not an "unprecedented" surge, but a warning sign for response capacities

Although the global data is far from perfect, what data there is shows an on-average increase in outbreaks and case numbers relative to recent years. While data collection standards and methods need to be improved, the numbers are not unprecedented or even at the level of a decade ago. More concerning is the apparent rise in case fatality rates over the past four years, with some places reporting as high as four times the widely accepted attainable threshold of 1%. A rise in fatality rates from a disease that experts agree "nobody should die from" raises questions as to the quality of the response. In fragile contexts that are already hosting humanitarian responses, high case fatality rates signal serious gaps in capacity for rapid action and/or the necessary competencies for effective treatment.

Global strategic coordination: Good on paper, lagging in implementation

The global entities leading on cholera, most notably the Global Task Force on Cholera Control (GTFCC), have by all accounts made great strides in marshalling the consensus and capacities of national and international actors toward a common set of goals. The global strategy, with its nested national cholera plans, has gained the endorsement and participation of the international aid and public health communities as well as national governments. Yet only two countries have implemented the plans so far, and the specific objectives of the Roadmap 2030 strategy for eradicating cholera are highly unlikely to be met.

Achieving the stated objectives requires funding for implementing the national cholera plan and expert surge capacity for the coordination of, and response to, outbreaks – both of which are lacking. In the first instance, global public health actors working on cholera have struggled to raise the visibility of the disease amid multiple competing emergencies, including other disease outbreaks needing attention, and in the wake of an exhausting experience with the COVID-19 pandemic whose aftershocks are still playing out on economies and societies. As to technical operational coordination, the problem lies in lack of adequate technical capacity at the World Health Organization (WHO) and its partners, and continued barriers to effective coordination between its work in health and those of its counterpart, United Nations Children's Fund (UNICEF), and its respective partners in water, sanitation, and hygiene (WASH).

Structural impediments and conflicting priorities

Stamping out a cholera outbreak requires the quick identification and treatment of cases (health interventions) while simultaneously eliminating the sources of the contamination (WASH interventions). It is now well understood that cholera control and response rely on the integration of activities in the health and WASH sectors, plus important ancillary activities, like teaching people about the disease and how to mitigate it given much of the transmission occurs in the home. In practice, however, 'siloisation' and coordination challenges remain, not only among humanitarian sectors, but also among relief and development actors, international and national entities, donors, and even among the different ministries in national governments.

Some of the difficulties in strategic coordination stem from the different priorities and approaches of the key actors. Much public health action in cholera, for instance, emphasises short-term interventions to control outbreaks, while global WASH efforts are more oriented to longer-term elimination – on the compelling reasoning that infrastructure investments in water and sanitation systems yield undeniably higher returns in money, and lives saved, as opposed to costly short-term and unsustainable interventions like trucking in water. The funding modalities of major donors reinforce the divides and perpetuate the reactivity trap. Also, the benefits of adequate WASH systems go far beyond cholera and even beyond acute diarrhoeal diseases as a whole.

Operations at country level: Capacity gaps and loss of 'the basics'

Apart from coordination impediments, observers also note a decline in organisational technical capacities in WASH among humanitarian agencies, as well as a sense that opportunities for investing in more durable WASH solutions are continually passed over due to short-term funding modalities as well as short-sighted cost calculations.

In the health sector, there is also some evidence of a decline in the provision of basic interventions such as simple oral rehydration therapy (ORT) points and in-home treatment. De-emphasising cholera in public health systems, as well as growing patient preferences for over-medicalised interventions – such as the unnecessary use of intravenous rehydration – may be contributing to a loss in the basic competencies. The case-area targeted intervention approach for cholera (CATI), when done well and at the right point on the epidemic curve, has gained wide acceptance as being effective, but more data is needed, clearer standard operating procedures tailored to different contexts need to be developed, and it is still far from being implemented at scale. Finally, health officials in vulnerable countries – experiencing a sense of exhaustion and low morale in many cases – lack rapid, ground-level technical support from epidemiologists and cholera response specialists serving as mobile teams to help direct

the response. This becomes all the more urgent when response is hindered by insecurity and access constraints. A critical shortage of oral cholera vaccine (OCV), caused by a primary supplier's decision to cease production in 2023, has further weakened capacities for prevention and response.

Data challenges

Cholera response suffers from a dearth of reliable data, at the global and operational levels. Misaligned incentives have led to both the over- and underreporting of cholera cases, clouding the global picture. Surveillance and reporting quality varies widely by country, but issues also arise when data is available, but not shared among agencies. For a disease that kills so quickly if allowed to spread unchecked, timely data is essential. Given that the experience with Ebola demonstrated that good reporting and surveillance is possible when prioritised, the current state of data in global cholera is unacceptable.

Areas for action

Get back to basics: At the outbreak level, responders need to ensure sufficient skills and capacity for the provision of ORT at community level, as most cholera patients do not require more medicalised intervention. This entails continual training, as knowledge and skills can easily be lost when a county has not experienced cholera for many years. Risk communication and community engagement (RCCE) efforts should emphasise the preferability of simple treatment at or close to home, and packets of oral rehydration salts (ORS) should be readily available at every level of the system and their use encouraged.

Strengthen coordination for effective response: As the key global cluster leads, WHO and UNICEF should take steps to clarify, deconflict and strengthen their joint coordination role in cholera response. This requires the personnel capacity to have dedicated coordination staff deployed in outbreak countries to implement the Joint Operational Framework and ensure effective programme integration.

Consider building regional-level capacity: Acknowledging the problem of overstretch and human resource limits on global agencies, donors and state members of regional organisations could consider developing cholera-specific surge capacities at the regional level, potentially within existing health centres within regional organisations, such as the African Union's Africa Centres for Disease Control and Prevention (CDC).

Improve data: A major effort is needed to improve gathering and sharing of data for improved cholera surveillance and more effective response. Data gathering systems face inherent challenges in fragile contexts, especially those undergoing conflict, but there is no excuse for data not passing between coordinating and implementing agencies and across sectors. In the meantime, responders should not delay action in responding to suspected cholera outbreaks until perfect data arrives, but rather should develop a risk-based approach to interpreting the signals from such data that is available.

Make funding more flexible and risk-responsive: In addition to investing in longer-term WASH and health programmes, donors should act to increase access to rapid funding that is necessary for effective response to outbreaks. This includes both more flexible financing with 'crisis modifiers', allowing for funding streams that are not strictly humanitarian to be instantly re-programmed for emergency interventions, and greater amounts programmed

through humanitarian pooled funding mechanisms that allow for quick decision-making and allocations. If the anticipatory action efforts of the Central Emergency Response Fund (CERF) continue to show promise, they should be further expanded to enable quicker responses when there are suspected cholera outbreaks.

Increase vaccine availability: The OCV is an effective complementary tool in cholera control, and greater production is urgently required. Concerted advocacy by Gavi, national governments, donors, UN agencies, and NGOs is needed to work with pharmaceutical companies to find a solution to rapidly increase production of the vaccines to a level sufficient for availability, wherever they may be needed, at the two-dose schedule.

Do not lose focus: Although it is just one of many serious diseases that public health systems and humanitarian responders contend with, cholera has unique features that deserve special attention and vigilance. Its ability to kill and to spread so quickly demands a level of preparedness and capacity for rapid response, as well as a basic skill set that cannot be allowed to atrophy. The GTFCC has been doing good work in raising the issue at numerous fora, and public health entities could likewise benefit from maintaining a distinct capacity and focus on cholera.

1 The current situation in historical context

Cholera is an acute intestinal infection caused by ingesting water or food contaminated with human faeces that contain the bacterium, Vibrio cholerae O1. The pathogen thrives in conditions of water scarcity, crowded living conditions, and poor sanitation. Cholera is endemic to many regions of the world, and new outbreaks of the disease tend to accompany sudden shocks, such as conflicts or natural disasters, where people are displaced or otherwise lose access to clean water, good sanitation, and the means to practise good hygiene. It also emerges when public services degrade due to economic pressures or political neglect, and water and sanitation systems are not maintained. Cholera thus can be a bellwether of disruption or decline.

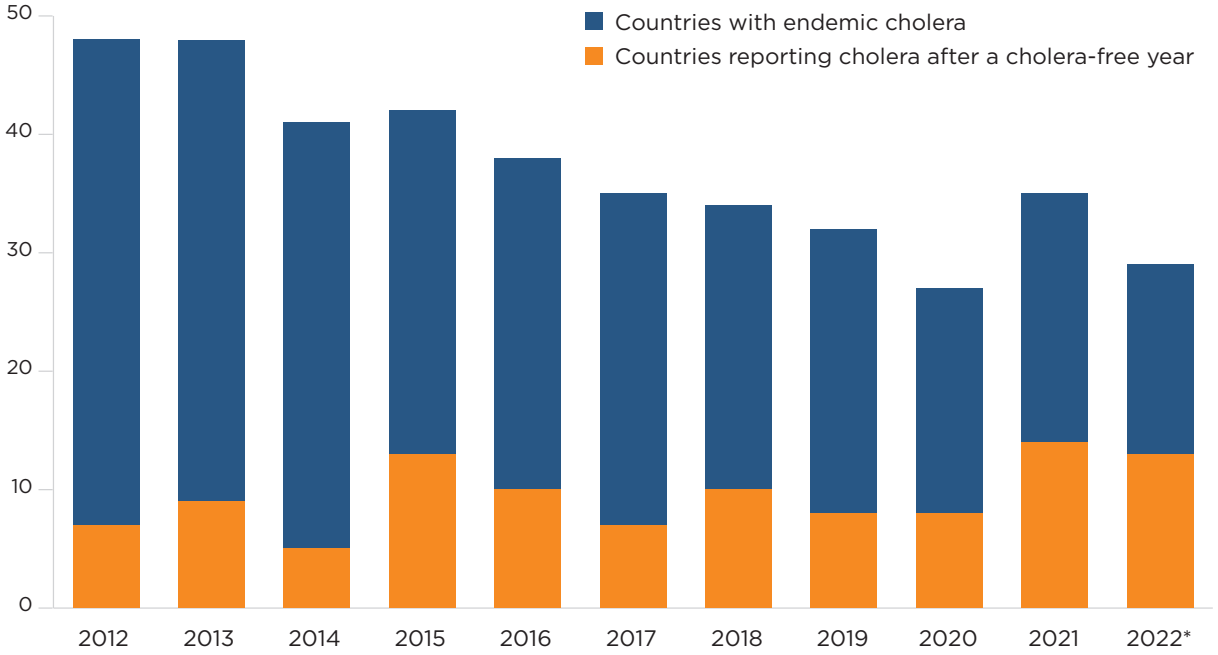
Approximately 10% of people infected with cholera will develop severe watery diarrhoea and, if not treated quickly to replace fluids and electrolytes, can die within days or even hours. Uncontrolled outbreaks can spread rapidly through untreated water, contaminated food, and unwashed hands, and can decimate populations before they burn out. However, relatively easy and low-cost rehydration therapy is so effective when done correctly that the number of people dying from cholera should be close to zero.

Having just entered the seventh decade of the seventh global pandemic of cholera, three developments are notable.[1] First, cholera outbreaks and case numbers – while lower than they were decades ago – now seem to have ticked upward, whereas deaths from other forms of diarrhoeal disease have significantly declined. Second, there are outbreaks in locations where cholera has not been before, or where it has been absent for a long time. Finally, and most importantly, some places are reporting case fatality rates that are two to four times the conventionally acceptable threshold of 1%.

1.1 Trends in outbreaks and fatalities

In 2021, the number of countries experiencing cholera cases rose by 77%, from 27 in 2020 to 35 in 2021, with an almost two-fold rise in countries that had been cholera-free the previous year (Figure 1).[2] This included new outbreaks in countries where cholera is endemic (Chad and Somalia), places where it has been reintroduced (Haiti), and where it is resurgent after a long hiatus (Lebanon).

Figure 1: Number of countries reporting cholera outbreaks, 2012–2022



Source: WHO (2021); WHO (2022, 16 December).

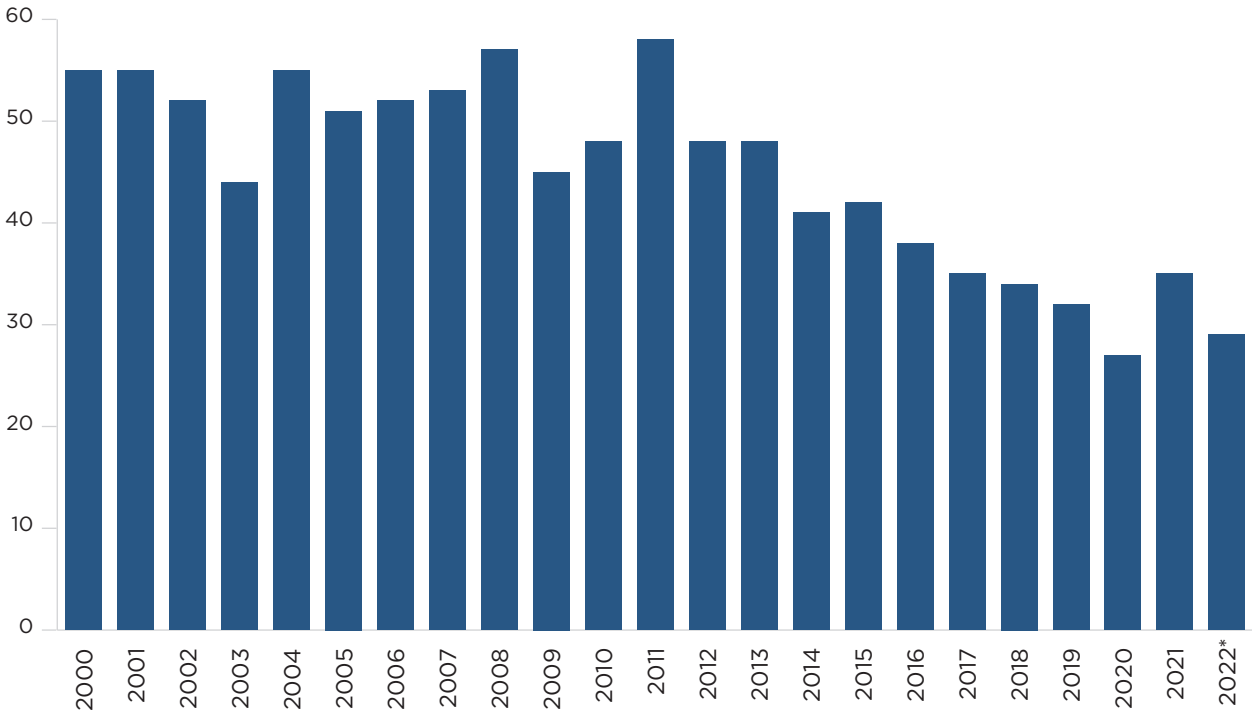
**Note that full global data from member states for 2022 was unavailable at the time of writing.*

[1] There were six cholera pandemics between 1817 and 1923. The seventh started in 1961 after a hiatus of 38 years.

[2] World Health Organization (WHO). (2021). *Cholera cases officially reported to WHO by member states from 2000 to 2021.* https://worldhealthorg.shinyapps.io/page10cholera_data/; WHO. (2022, 16 December). *Cholera – global situation.* https://www.who.int/emergencies/disease-outbreak-news/item/2022-DON426. Note that full global data from member states for 2022 was unavailable at the time of writing.

Despite some hyperbole in agency communications and press reports using words like "unprecedented" to describe the current prevalence, a long view of the cholera pandemic shows a mostly downward trend, with the average number of countries experiencing outbreaks each year over the past decade 25% lower than the decade before (Figure 2).

Figure 2: Number of countries reporting cholera outbreaks, 2000–2022



Source: WHO (2021); WHO (2022, 16 December).

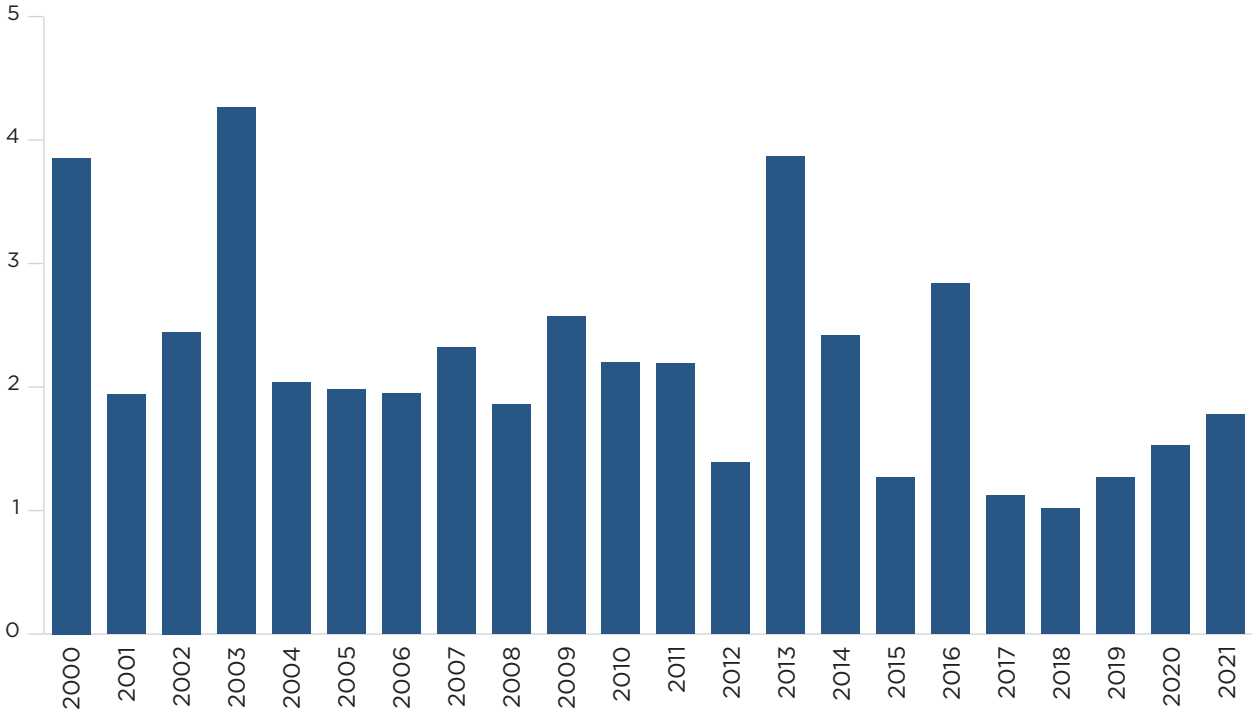
**Note that full global data from member states for 2022 was unavailable at the time of writing.*

So, while current cholera levels are hardly "unprecedented", global public health experts interviewed for this review (see Appendix A) confirmed that the size and geographical pattern of outbreaks occurring concurrently is "definitely unusual" and "a concerning trend". Whether it is due to climate change, COVID-19 after-effects, or other factors in combination, the trend has been sufficiently concerning for some in global health entities to shift their emphasis in their current work from longer-term elimination strategy to outbreak response activity.

The data becomes less reliable at the level of case counts and deaths because of disparities in diagnosis and reporting, but 2021 also appears to show a rise in case fatality rates and total deaths worldwide. As one article reported, "Amid concern that the upsurge is being driven by extreme climate events and displacement of people because of war, WHO [the World Health Organization] reported that the flare-ups have become larger and more deadly."[3]

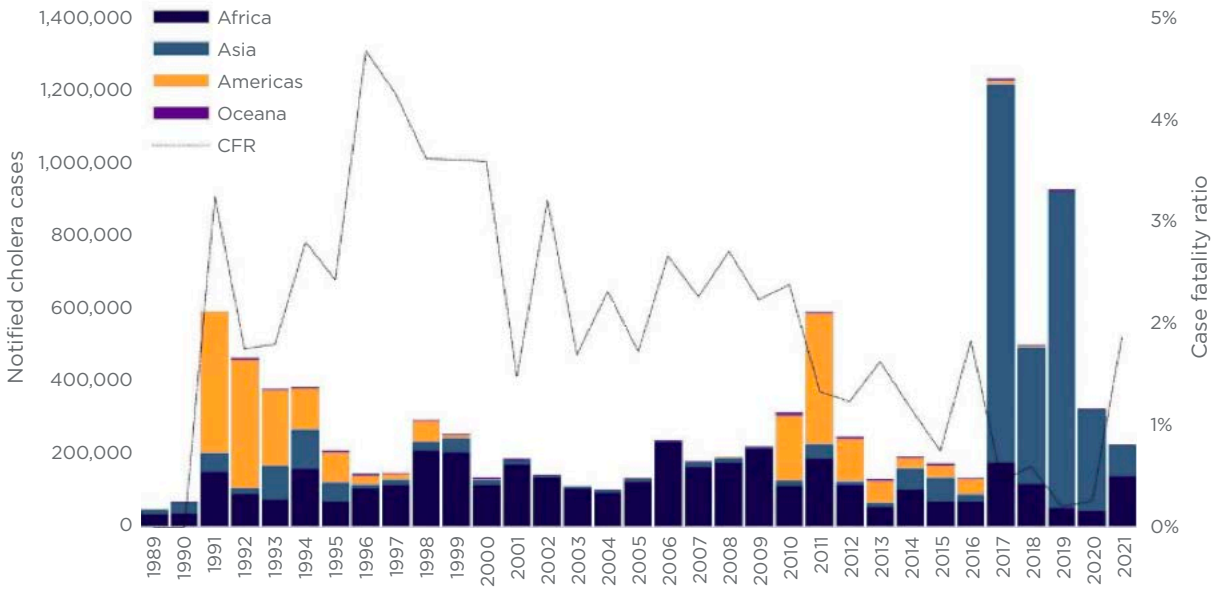
[3] Feinmann, J. (2023). *The BMJ Appeal 2022-23: Cholera on the rise and how IFRC is working to fight it.* BMJ. https://doi.org/10.1136/bmj.o3007

Figure 3 (a): Average case fatality rate, 2000–2022



Source: WHO (2021)

Figure 3 (b): Global case fatality rates against case counts, 1980–2021

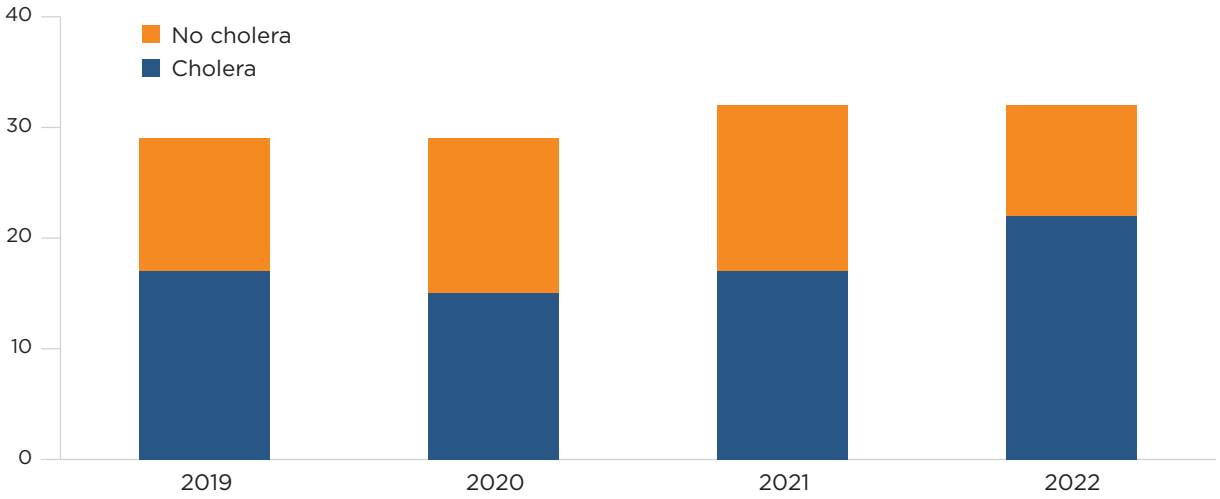


Source: WHO (2022, 16 December)

Any rise in case fatality rates is concerning, and especially given advances in recent decades against diarrhoeal diseases in general and in cholera treatment specifically, with the introduction of an oral vaccine in the 1990s. Regardless of the number of outbreaks, if people are dying from cholera at greater rates, it signals that something is missing or defective in the response.

Finally, cholera is increasingly present within the humanitarian caseload. Since 2019, there have been cholera outbreaks in over half of the countries experiencing humanitarian emergencies (defined as those with humanitarian response plans or flash appeals), and by 2022 more than two-thirds of humanitarian emergency countries were experiencing outbreaks (Figure 4a). Additionally, comparing the countries experiencing humanitarian emergencies with other outbreak countries between 2019 and 2021, the humanitarian emergency countries had average case fatality rates twice as high (Figure 4b).

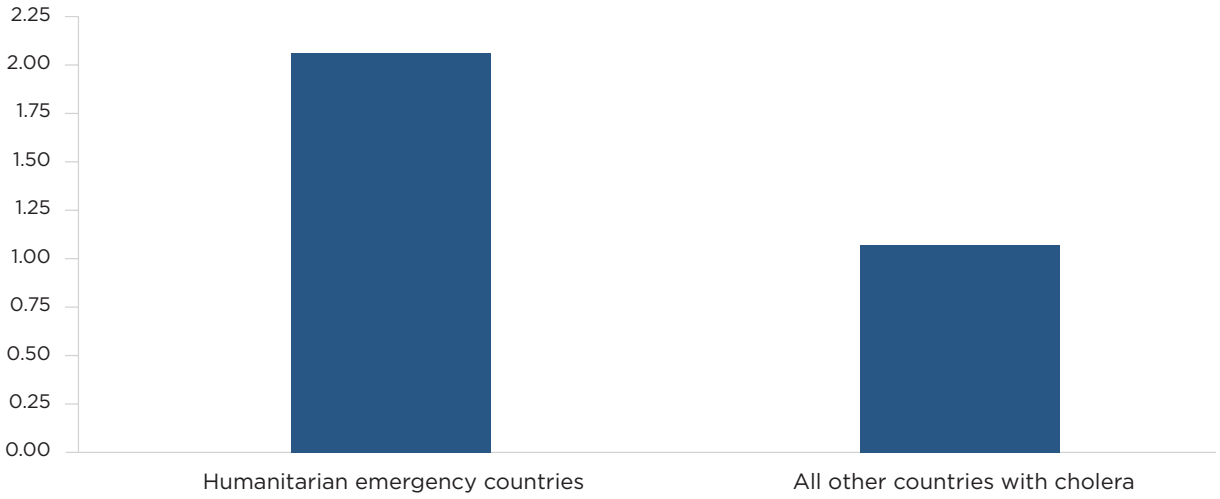
Figure 4(a): Number of humanitarian settings with and without cholera



Source: Financial Tracking Service (FTS) (2023)[4]

Note: Humanitarian settings are defined in this instance as settings with a humanitarian response plan or flash appeal.

Figure 4(b): Average case fatality rates in humanitarian and non-humanitarian settings, 2019–2021



Source: WHO (2021); FTS (2023). Note: Humanitarian settings are defined in this instance as settings with a humanitarian response plan or flash appeal.

In countries undergoing chronic crisis conditions, cholera is a major contributor to morbidity and mortality, is often tied with malnutrition, food insecurity, and famine, and entails massive economic costs.

[4] Financial Tracking Service (FTS). (2023). Appeal overviews. Office for the Coordination of Humanitarian Affairs (OCHA). Retrieved 2 February 2023 from https://fts.unocha.org/

1.2 Causes and contributors of current outbreaks

Conflict, fragility, and continuing climate pressures have all contributed to an increase in the number and locations of cholera outbreaks since 2021. Conflict, much like natural disasters, can disrupt water and sanitation systems, leading to contamination of water sources and to cholera, if V. cholerae O1 is present in the environment or is introduced. Conflict-driven displacement can lead to overcrowding in settings with limited water supplies, making it easier for the disease to spread if adequate precautions are not taken. Practically, conflict can also undermine the ability of public health systems to respond effectively to cholera outbreaks, allowing the disease to proliferate.

"Cholera thrives in poverty and conflict but is now turbocharged by climate change", as a WHO regional spokesperson described it.[5] Because the vibrio lives in slightly saline waters like swamps and can remain dormant for many years, it is not unreasonable to assume that as the planet and its seas and lakes warm, cholera pathogens will increase. By increasing standing water and knocking out safe water systems, heavy rains, such as those that flooded a third of Pakistan in 2022, can also drive outbreaks.

Low-income countries with damaged or underinvested water and sanitation systems, have seen water problems exacerbated by urbanisation trends, economic migration, and growing population density. At the same time, many rural communities have a chronic lack of access to safe water sources. Water, sanitation, and hygiene (WASH) experts interviewed for this review noted that many countries have "gone backwards" in terms of their rural water authorities and systems. Additionally, poverty may mean a lack of access to hygiene materials or the means to store water safely in the household.

After COVID-19, already overstretched national health systems suffer from outbreak response fatigue and demoralised personnel. In countries where cholera is endemic, there is also a noted tendency to downplay and deprioritise the disease in light of other concerns deemed more pressing.

Syria and Lebanon

In late 2021, a cholera outbreak that began in IDP camps in northern Syria spread rapidly in the region and neighbouring Lebanon. On the basis of the currently available data, it was impossible to clearly identify the trajectory of the outbreaks, but they were seen to have plateaued after the initial rapid expansion of case numbers.[6]

In both countries, the presence of cholera is seen as symptomatic of significant and widespread decline of basic service provision over the course of the past decade owing to ongoing conflict and its consequences: mass displacement, worsening economic conditions, lack of attention to infrastructure, and the politicisation (at times even weaponisation) of water supply. All this on top of climate-induced shocks, which have affected water levels, including the Euphrates. Many of the challenges inherent in the Syria response are clearly due to the diverse range of operational contexts, including multiple areas not under government control, and the challenges of working across them.

[5] Inas Hamam quoted in Chehayeb, K. (2022, 4 November). *Conflict, crisis fuel cholera surge across Mideast hot spots.* Associated Press. https://apnews.com/article/health-business-syria-lebanon-iraq-6c46c5bd5e2ea62f582c5f871f68135d

[6] One interviewee noted that cases in Lebanon are recorded as people enter hospitals and health centres with any digestive/nausea symptoms and there was a lack of systematic follow-up to record confirmed cases against initial reports. The same interviewee estimated that 20%-30% of the cases reported in Lebanon are people lying to get into the hospital for other issues while avoiding any financial requirements.

In Lebanon, interviewees described the current outbreak as equally predictable and avoidable, representing a "complete and utter failure of the state" in its management and upkeep of the supply of safe water.

In both Syria and Lebanon, interviewees saw cholera outbreaks as part of a global crisis yet, at the same time, rooted in the crisis context of each country.[7]

Haiti

In October 2022, Haiti declared its second outbreak of cholera since the 2010 earthquake. A shipment of vaccines did not arrive until December, two months later.[8] Aid actors already on the ground were similarly slow to respond, in some cases reportedly taking as long as three to four months just to set up treatment facilities. The operational environment in Haiti is difficult and dangerous, owing to political collapse and a surge of gang violence. While it initially constrained the spread of the disease by limiting the mobility of the population, a critical fuel shortage, which was sparked when a gang seized control of the country's main fuel terminal for a month, has added to the logistical challenges of the response Movement and power constraints naturally also limit epidemiological surveillance, meaning the severity of the outbreak is not fully known.[9] Donors, while acknowledging the difficulties, lament the seeming inability of aid agencies to shift more quickly into disaster response mode. For their part, the agencies are also frustrated with the response, but, as one UN interviewee noted, "Because of the complexity of the situation in Haiti, it's almost impossible to do better." Meanwhile, hundreds of Haitians have died of cholera since the outbreak began, many of them children.[10]

Malawi

The cholera outbreak in Malawi has recently gained global attention as particularly dire.[11] By the end of December 2022 there were an estimated 10,000 active cases in total, present in 27 out of 31 districts and still spreading, with 1,000 new cases reported per day. A month later, an estimated 900 Malawians had died of the disease. The country's average case fatality rate was 3.3%, with some locations reporting case fatality rates as high as 4% – four times higher than the conventionally accepted threshold.

Among the dozen poorest countries of the world, Malawi is no stranger to cholera. Heavy rainfall in the last rainy season exacerbated the pre-existing vulnerabilities: unsafe water sources in the rural areas, contamination in markets, crowded conditions and lack of adequate sanitation. According to interviewees working in the context, the current surge caught the population and the health authorities off guard, occurring at an unusual time of year, and cholera symptoms were mistaken for other forms of acute watery diarrhoea. Without rapid action to stem the outbreaks in the early days, cholera quickly spread throughout the country.

The cause of the high fatality rates is harder to identify, but interviews and press reports emphasise the remoteness of communities in a population that is more than 80% rural, and the need for people to travel long distances to reach care. The numbers come with a great

7 In Lebanon, for example this is linked to the sense that the strain is identifiable from Asia (interview) and cases almost certainly brought in from Syria.

8 Taylor, L. (2022, 22 December). *Haiti receives its first batch of cholera vaccines to tackle deadly outbreak.* The Guardian. https://www.theguardian.com/global-development/2022/dec/22/haiti-receives-its-first-batch-of-cholera-vaccines-to-tackle-deadly-outbreak

9 PAHO/WHO email (2023, 8 January). PRO/EDR> Cholera, diarrhea & dysentery update (02): Americas (Haiti, Dominican Republic).

10 The high proportion of children among cholera victims in Haiti is explained by partial immunity in the rest of the population from massive outbreaks of the 2010s, combined with the mass vaccination campaigns that followed.

11 Matonga, G. and Eligon, J. (2023, 22 January). *In a nation that nearly wiped out cholera, the disease is surging back.* New York Times. https://www.nytimes.com/2023/01/22/world/africa/malawi-cholera-outbreak.html?searchResultPosition=1

deal of uncertainty, but whether the case fatality rates were calculated for all cases (people dying at home, on the road, and in the hospital), or just from hospital cases, the implication is the same: patients did not receive the basic rehydration treatment that would have saved their lives, and which, in the vast majority of cases, does not require formal medical facilities or professional personnel.

2 Global strategic coordination

At the centre of the international structures for coordination on cholera sits the Global Task Force on Cholera Control (GTFCC). The GTFCC is a multi-partner, public-private partnership of more than 30 academic institutions, NGOs, and UN agencies, with a secretariat that sits at WHO.[12] Originally established in 1992 following the cholera outbreak in Peru and revitalised in 2014 following a call by the World Health Assembly in 2011, the GTFCC serves as an authority on protocols and best practices, provides technical and policy guidance, coordinates strategic planning, and mobilises attention and resources for anti-cholera efforts.

In 2017, the GTFCC launched the initiative Ending Cholera: A Global Roadmap to 2030,[13] an ambitious strategy aimed at stopping transmission and reducing cholera deaths by 90% by 2030. The Roadmap contains three strategic focus areas: 1) Early detection and quick response to contain outbreaks; 2) A multisectoral approach to prevention in cholera hotspots; and 3) Coordination of technical support, financial resources, and partnerships locally and globally. The Roadmap envisages countries will define and implement national cholera plans. In 2018, the World Health Assembly committed to the Roadmap, as did the WHO Regional Committee for Africa, where 47 member states adopted a regional strategy aligned with the Roadmap.[14]

While the GTFCC engages and provides a convening platform for operational coordination, it is not meant to serve as an operational coordinating body itself, focusing on long-term elimination rather than response to outbreaks. Instead, the operational coordination role is split between WHO for health and the United Nations Children's Fund (UNICEF) for WASH, with and through the global health and WASH clusters respectively. However, when clusters are not activated, it can complicate the support role that the global health and WASH clusters can provide to country responses. Additionally, the Global Outbreak Alert and Response Network (GOARN) plays a role in providing technical support and international public health resources to control outbreaks.[15]

In spite of improvements in global coordination through the GFTCC, this has not yet consistently translated into stronger national-level action. There are only two countries (Ethiopia and Kenya), according to the GTFCC website, whose national plans have gone through its independent panel review, with three countries' plans still pending review. The International Federation

[12] For a list of partners in the GTFCC, see: https://www.gtfcc.org/partners-in-action/

[13] Global Task Force on Cholera Control (GTFCC). (n.d.-a). *Ending cholera. A global roadmap to 2030.* https://www.gtfcc.org/wp-content/uploads/2019/10/gtfcc-ending-cholera-a-global-roadmap-to-2030.pdf

[14] Regional Committee for Africa. (2018). *Regional framework for the implementation of the global strategy for cholera prevention and control, 2018–2030: Report of the Secretariat.* WHO. Regional Office for Africa, 68. https://apps.who.int/iris/handle/10665/275121

[15] See: https://goarn.who.int/

of Red Cross and Red Crescent Societies (IFRC) is now working to support countries to operationalise their national cholera plans. While interviewees felt that progress is now being made, it remains in the early stages.

National-level plans will only be useful if they are funded. Interviewees noted that some countries had budgeted national cholera plans, but a lack of funding meant that they had been "put on the shelf" and smaller annual plans had been adopted instead.

2.1 Roadblocks: Scarce resources and the shifting spotlight

Roadmap 2030 provides a clear direction to address cholera, but its implementation faces several obstacles.

The GTFCC has limited resources at its disposal to support the Roadmap's implementation. It is hoped that IFRC's support for implementation through improved community engagement, including through national Red Cross and Red Crescent societies, will help drive progress towards the Roadmap's goals. However, many of the Roadmap's ambitions are quite long-term. For example, "long-term sustainable WASH solutions" and "strengthening health care systems to anticipate cholera outbreaks" require significant investment and the engagement of multiple actors. With COVID-19, there was a hope that the importance of investing in WASH would be prioritised, given its critical role in public health emergencies and as a way to meet the sixth sustainable development goal (SDG 6) to "ensure availability and sustainable management of water and sanitation for all", but this does not seem to have yet translated into reality. There remains a lack of investment overall in WASH, which is essential in the prevention of cholera and other diarrhoeal diseases.

The longer-term approaches in the Roadmap also need to be balanced with the goals of responding to outbreaks through multisectoral interventions. Getting cholera high enough on the priority list of the necessary actors to enable effective responses to outbreaks remains a struggle. Cholera has been competing with COVID-19 and other disease outbreaks (such as Mpox and Ebola) for the attention of national health authorities and other actors that respond to various diseases. In the absence of a major outbreak, such as that in Yemen in 2016 and 2017, small and medium-sized outbreaks of cholera across multiple countries have struggled to gain traction in terms of resourcing and attention. Given scarce funding and the challenges associated with identifying qualified individuals, particularly in protracted crises, the sheer number of humanitarian responses globally is stretching the ability of organisations to respond. There is also a sense of overwhelm and limited expertise around cholera prevention and response within national ministries.

2.2 Coordination frameworks: Overlapping and not always interoperable

While there have been attempts to ensure greater convergence between health and WASH responses by the global health and WASH clusters, particularly through their 2020 Joint Operational Framework, these efforts do not always translate into practice at the country level.[16] In non-humanitarian settings, where clusters are not operational, coordination is structured differently, through WHO's Incident Management System (IMS), which unlike the consensus-based humanitarian clusters, adopts a more directive, command-and-control way of

[16] Global Health Cluster and Global WASH Cluster. (2020). *Improving coordinated and integrated multi-sector cholera preparedness and response within humanitarian crises.* https://healthcluster.who.int/publications/m/item/joint-operational-framework-improving-coordinated-and-integrated-multi-sector-cholera-preparedness-and-response-within-humanitarian-crises

operating.[17] Because a non-humanitarian setting may suddenly turn into one, and humanitarian actors may find themselves needed to engage in a response for major outbreaks, clear rules and operating procedures will be required for integration of the different frameworks.

In humanitarian settings, individual cluster leads may need to be nudged to operationalise policies, or may need support to translate the guidance and existing research into practice. Interviews for this report underscored that other clusters also need to be more fully engaged in cholera responses – for example, the protection cluster, given the stigma around cholera, and the education cluster, to support risk communication and community engagement (RCCE). Greater strategic and political intent is required by agencies to effectively work together at country level to respond to cholera, particularly WHO, UNICEF, United Nations High Commissioner for Refugees (UNHCR), and Save the Children as cluster lead agencies of the global health, WASH, protection (led by UNHCR), and education clusters (co-led by UNICEF and Save the Children). Currently, that commitment from agencies is not seen clearly enough, leading to competition and the inadequate sharing of data and information in several cases. However, when there is a history of working in a multisector approach to prioritise the implementation of effective, evidence-based technological interventions, the responses to cholera (and other diseases, like COVID-19), can be much smoother. WHO/UNICEF cooperation contributed greatly to the reduction of under-5 childhood deaths from acute watery diarrhoea from 4.6 million per year in 1980 to 1.5 million per year in 2000.[18, 19]

The plethora of coordination frameworks adds a further layer of complexity in preventing and responding effectively to cholera. Coordination frameworks on the development, public health, and humanitarian sides are still not finding adequate ways to engage with, and coordinate across, various platforms. While attempts are being made from various sides, as one respondent put it, "We are in a very coordination-rich environment in terms of structures and how they are speaking to each other, and who has the mandate. If you drew it all out, it would look like a set of illegal pipelines". For example, while the GTFCC includes humanitarian actors, the relationship and link between the Roadmap 2030 and humanitarian coordination bodies or products, such as humanitarian country teams, clusters/sectors, or humanitarian response plans (HRPs)/ humanitarian needs overviews (HNOs), remains unclear. GTFCC's interim 2020 guidance, which provides support to countries developing national cholera plans, makes just one reference to health and WASH clusters when considering existing coordination bodies and mechanisms, although it does say the plan should link with relevant emergency and development frameworks and plans.[20]

A concern raised with the national cholera plan approach is that it risks moving away from more joined up, inter-agency plans around UN common country assessment (CCA), which reflect the SDGs, or HRPs. The plans around cholera seem to be too often disjointed or completely disconnected from humanitarian actors, HNOs, and HRPs. When such plans are being developed, clusters are not necessarily being adequately engaged in the process. In some cases, where there are outbreaks of cholera identified by some actors, others will await a government declaration before putting preparation efforts in place to respond in a timely manner.

[17] An exception was during the Ebola response in West Africa, when both the cluster system and the IMS were running in parallel, with the clusters meant to be focusing on the broader humanitarian response and the IMS focusing specifically on the public health response. This caused confusion and problems of its own.

[18] Cholera is distinct from other forms of acute water diarrhoea because of its specific etiology and severity of symptoms. Other acute watery diarrhoea can be caused by a variety of pathogens, including bacteria, viruses, and parasites, and usually does not progress as quickly or severely as cholera.

[19] Victora, C.G., Bryce, J., Fontaine, O. and Monasch, R. (2000). Reducing deaths from diarrhea through oral rehydration therapy. *Bulletin of the World Health Organization* 78, pp. 1246–1255. https://apps.who.int/iris/handle/10665/268000

[20] GTFCC. (n.d.-b). *Interim guiding document to support countries for the development of their national cholera plan.* https://www.gtfcc.org/wp-content/uploads/2020/11/gtfcc-interim-guiding-document-to-support-countries-for-the-development-of-their-national-cholera-plan.pdf

While the work IFRC is doing in terms of preparedness and working with governments to put in place national coordination platforms for cholera in line with Roadmap 2030 is appreciated, concerns were raised in interviews around how development and humanitarian actors would coordinate in case of an outbreak, and whether coordination structures, like clusters, were being taken into consideration. Agencies that sit across the different coordination platforms used by relief and development actors, such as WHO and UNICEF, could be playing a stronger role to ensure better links between the development/public health and the humanitarian spheres when it comes to cholera. As lead agencies of the health and WASH clusters, they are well placed to help ensure representation of clusters in development and public health fora.

The pandemic instrument being negotiated by WHO's member states could have further implications for the coordination frameworks relating to cholera response in the future, particularly given it will be a binding treaty for its signatories.[21] It will be critical to ensure that coordination mechanisms are complementary and not counterproductive or overly time-consuming.

2.3 Operational leadership and coordination support gap

At the operational level, cholera response suffers from a lack of leadership and weak coordination. In countries with under-capacitated public health systems, or that are unfamiliar with cholera, such coordination often requires surge capacity, meaning a team of epidemiological and operational coordination experts coming in to support the coordination of national and civil society efforts. Some mistakenly believe this is the role of the GTFCC, which is unfairly "being asked to do a massive lift on coordination" of worldwide cholera response. Others point to GOARN, but this too is more of a technical rather than an operational body. Although it can deploy staff from partner agencies to support WHO's efforts by request, it is designed primarily to assess risks and provide advice on disease outbreaks. The responsibility for operational coordination and capacity sits instead with the operational agencies, local, regional, and international. As the leads of the global health and WASH clusters, said one donor representative, "WHO and UNICEF need to figure it out". Despite years of discussion and documentation of how important it is to ensure coordination in emergency response, however, the consensus seems to be that "it is still not happening, they are passing the buck".

According to interviewees for this report, most of the roads lead back to WHO, and the fact that the organisation is "not leading or coordinating enough. Their capacity to move into action mode is still too weak." At the root of the frustration seems to be a human resources issue. Despite what is set out in its emergency response framework (ERF), WHO does not appear to have a wide enough pool of experts to be able to deploy people as needs demand in affected countries, most recently for cholera in Malawi and Lebanon. Said one, "They just need to be better. There has been so much investment in structures that would allow them to deploy people immediately. I get it that we are all overwhelmed, but the point of investing in WHO was so that they would have this surge capacity."

It may be that situating surge capacity at the global level is not the most logical or efficient allocation of resources. In much of humanitarian action, capacity investments take place at the global and national levels, eliding regional structures, such as the African Union and ASEAN, which have public health entities that may be better positioned to play the role. The value of regional-level coordination was underscored by one agency representative, noting the inherent challenge of trying to follow 30 countries from headquarters.

[21] WHO. (2022). *Pandemic instrument should be legally binding, INB meeting concludes.* https://www.who.int/news/item/21-07-2022-pandemic-instrument-should-be-legally-binding--inb-meeting-concludes

3 Ground-level response: Capacities, competencies, and coordination

Effective responses to cholera require good epidemiological data, quick action from humanitarian health and WASH sectors, coordination between development and humanitarian actors, and the balancing of priorities to get the right mix of health and WASH investments. It therefore requires things that humanitarians and international aid generally have long been challenged by: working effectively across sectors and putting commitments around the nexus, or linking relief and development, into concrete action.

Alongside the perennial coordination challenge, the evidence from interviews and a meta-review of the literature (see Appendix B) suggests deficits in core competencies in health and WASH programming that may partly account for alarming case fatality rates, despite decades of experience dealing with cholera and the addition of an effective oral vaccine to the cholera toolbox.

3.1 Easy but not simple: Health responses in cholera, and the risk of competency decline

Some have suggested (erroneously) that cholera gets its name from the ancient Greek word for "roof gutter" – an apocryphal but vivid depiction of a disease that causes gushes of water to be excreted by a human body infected with it.[22] If enough Vibrio cholerae O1 bacteria are ingested, and survive passage through the acidic environment of the stomach, they reproduce rapidly in the gut, colonising the intestinal wall and releasing a toxin that causes the rapid excretion of watery stool, thereby propagating the pathogen in the environment where it can find new hosts. In the individual patient, the disease of cholera is not to be cured, but rather managed in its acute phase (over a few days), by replacing the equivalent volume of fluids quickly enough to prevent death by dehydration before the illness runs its course. In other words, when people die from cholera, it is for one of two reasons: delayed access to rehydration treatment, or rehydration treatment done poorly.

The low-tech and low-cost standard treatment, oral rehydration therapy (ORT), requires only that responders rapidly identify cases and provide patients with a drinkable solution of water, salt, and glucose, and other electrolytes given in sufficient quantities. Rehydration should begin as early as possible in the course of illness, with appropriate fluids and electrolytes given in sufficient quantity to replace prior and ongoing losses. In more extreme cases, where fluid and electrolyte losses may be greater than can be replaced orally, IV rehydration (for patients in shock, vomiting, and/or unable to drink adequate replacement amounts of ORS) and/or antibiotics may be needed, but these will only be in a minority of cases. Patients that are brought to health facilities or hospitals ideally should already have received some treatment.

According to some experts, case fatality rates tend to be high in areas that lack familiarity with the disease and the response protocols, or that have forgotten how to treat cases properly. Although ORT does not require doctors or professional healthcare workers to implement, it is not intuitive, and it requires basic knowledge and a minimum of training to ensure it is done

[22] The first mention of "cholera" deriving from an ancient Greek word meaning "gutters" seems to be Emile Littre's *Dictionnaire de médecine, de chirurgie, de pharmacie et des sciences qui s'y rapportent* (1884). But the claim is uncited, and does not appear in Chantraine's etymological history or the most comprehensive ancient Greek lexicon, Liddell-Scott-Jones (LSJ); nor does it appear anywhere in the Thesaurus Linguae Graecae (TLH), a digital database of every ancient Greek word published. According to classicists, it is more likely derived from the word "chole," meaning "yellow bile".

right. In particular, people tend to underestimate the amount of fluid needed, and fail to monitor how much the patient drinks. Also, homemade salt-sugar-water solutions are sometimes substituted for ORS packets, but these are suboptimal; the premixed packets are safest and most effective.

In addition to ORT, competencies need to be maintained in things like procedures for triage and referrals, setting up line lists, and contact tracing.[23] There is a risk that knowledge of all these protocols will degrade if it is not consistently emphasised in training and public health messaging as the best and default mode of treatment for cholera. More than one expert expressed concern that, perhaps because a vaccine is now available, or because cholera increasingly gets lumped together with other childhood or diarrhoeal disease management that does not require this intensive treatment, that ORT does not seem to get the attention and emphasis it once did.

Another factor raised often in interviews was the fact that, increasingly, people have a preference for more formal medical interventions, seeking treatment in hospitals and health facilities for example, and favouring IV rehydration and antibiotics over drinking ORS. This may also reflect a loss in general knowledge and understanding about the disease and the need for more active messaging and public education, in which aid providers can help to play a role.

Competencies are not separable from capacities and resources of course. As an outbreak spreads, more boots on the ground are required to identify and treat or transport patients – but agencies and NGOs report that, in many cases, neither they nor the national public health system have adequate capacity to meet the moment. The key weakness in most contexts, said more than one interviewee, is the lack of skilled, experienced personnel. Said another "Our IPs [implementing partners] are not able to cope – they don't have the means, skills, and aren't supported to implement their mission." This includes some international NGOs, which do not always have the training required to train local counterparts. Like national health ministries, international agencies are reportedly stretched thin, with previous and ongoing epidemics having taken their toll. A repeatedly cited deficiency is the lack of incentives for national health care workers, many of whom are not paid well or consistently – a problem that cannot be solved by humanitarian organisations coming in 'horizontally' to provide workshops and training.

A local NGO representative in Malawi said that the cholera cases are mostly among the rural poor in remote, hard-to-reach places where NGOs have to do outreach for treatment, noting "some health workers are not well trained for this new outbreak". A recent article by Matonga and Eligon for the New York Times described people travelling long distances for medical care in Malawi, "hospitals lacking basic supplies and many people seeking help only after falling very ill".[24] But this raises the question of why people should be travelling to hospitals for treatment when ORT points could effectively treat people in their own communities. Many hospitals and public health facilities themselves lack clean water and adequate sanitation, and may provide poor treatment. In such cases, the "delayed access to health care" explanation can be a way to effectively shift blame onto the affected communities.

The meta-review of articles and evaluative literature conducted for this review found humanitarian cholera response earned overall low marks on average (most falling between 'poor/negative' and 'neutral/mixed'), and in terms of specific categories of performance assessment, the lowest scores were ascribed to 'competencies' of personnel engaged in cholera control activities.[25]

[23] A line list is a record-keeping tool to track cases of cholera, identify close contacts, and monitor the epidemic curve. It typically includes each patient's name, age, sex, address, date of onset of symptoms, and any treatment received.

[24] Matonga, G and Eligon, J. (2023, 25 January).

[25] A systematic search of several online libraries found 121 journal articles related to cholera in humanitarian settings. Of these, 94 were found partially or fully relevant. This set of articles was then classified by the following criteria: Overall appraisal, effectiveness of response, capacity, competencies, and coordination. Reviewers scored each article from 1 to 5 (1 very negative/poor and 5 very positive/good) for each of these categories.

Many referred to the low level of skills of health staff or outreach workers, who had not received adequate training due to time and resource constraints. Inexperience, poor training, and "incompetence" were repeatedly cited in reviews spanning 26 years, with no shortage of recent examples.

> "The majority of hygiene promotion staff currently develop their skills on the job. However, many organisations reported that humanitarian crises are not an ideal learning environment, and that meaningful capacity building is not possible due to the short duration of programmes."
>
> (White et al. 2022)[26]

> "Of immediate concern across the case studies was the reported inexperience of staff with cholera case management protocols and/or lack of training they received if they had little to no experience in cholera case management. Inadequate care was potentially provided to admitted cases, and this will not only affect the CFR [case fatality rate] among the population but will likely affect the population's perception and uptake of the intervention."
>
> (D'Mello-Guyett et al. 2022)[27]

3.2 Not enough WASH

There was a consensus among people interviewed for this study that there is insufficient WASH response capacity in humanitarian settings – a perception strongly supported by the findings of reports from 2019 and 2021.[28] The time it takes to launch a response has been increasing – taking as long as 20 days, even for some of the fastest WASH responders, which leads to greater disease spread and risk.

To explain this apparent decline in humanitarian WASH response, many interviewees pointed to a trend among some agencies away from large emergency responses towards more sustainable programming. However, even where there were humanitarian responses in place, 'the basics' – such as good operation and maintenance – were seen to have slipped. Although the GTFCC has developed some basic protocols for WASH in cholera outbreaks, many institutions rely on their own guidelines and operating procedures, which in many cases have not been updated in some time. Publications have also noted that training resources have not been updated with the latest cholera research and technical innovations. A study by D'Mello-Guyett et al. in 2020 found huge divergence in standards across eight main technical guidelines.[29]

[26] White, S., Heath, T., Mutula, A.C., Dreibelbis, R. and Palmer, J. (2022). How are hygiene programmes designed in crises? Qualitative interviews with humanitarians in the Democratic Republic of the Congo and Iraq. *Conflict and Health*, 16, 45. https://doi.org/10.1186/s13031-022-00476-8

[27] D'Mello-Guyett, L., Cumming, O., Rogers, E., D'hondt, R., Mengitsu, E., Mashako, M., Van den Bergh, R., Okitayemba Welo, P., Maes, P. and Checchi, F. (2022). Identifying transferable lessons from cholera epidemic responses by Médecins Sans Frontières in Mozambique, Malawi and the Democratic Republic of Congo, 2015–2018: a scoping review. *Conflict and Health,* 16. http://dx.doi.org/10.1186/s13031-022-00445-1

[28] Grünewald F., Luff R., de Hove E. and Brangeon S. (2019). *The capacity of the wash sector to respond to difficult humanitarian situations: an analysis.* Groupe URD. https://www.urd.org/wp-content/uploads/2019/11/WASHCapacityStudy_GroupeURD_2019.pdf; Lantagne, D., Yates, T., Ngasala, T., Hutchings, P., Bastable, A., Allen, J., Hestbæk, C. and Ramos, M. (2021). *Gaps in WASH in humanitarian response: 2021 update.* Elrha. https://www.elrha.org/wp-content/uploads/2021/10/Elrha_Gaps-in-WASH-in-Humanitarian-Response_2021-Update.pdf

[29] D'Mello-Guyett L., Gallandat K., Van den Bergh R., Taylor D., Bulit G., Legros D., Maes, P., Checchi, F. and Cumming, O. (2020). Prevention and control of cholera with household and community water, sanitation and hygiene (WASH) interventions: A scoping review of current international guidelines. *PLoS ONE,* 15(1). https://doi.org/10.1371/journal.pone.0226549

As in the health sector, a number of respondents felt there had been a significant "loss of memory" in how to manage cholera outbreaks. This increases the delay in establishing effective response, adding to the delays created by waiting for case identification and confirmation as cholera (as opposed to general diarrhoea). Given patients can die within hours of contracting the disease, any delay is significant.

Respondents complained of a lack of an overarching WASH response strategy connecting preparedness, training, surveillance, and investments in relationships. However, within the WASH community there are divergent views on the best approach. All agree that having access to good quality water and well managed sanitation are key to preventing cholera outbreaks, and that lack of access to these drives people to contaminated sources. As one respondent noted about the situation of camps in Lebanon, "When water trucking stops you can time how long it will be before cholera appears." But this goes to the heart of the divergence in views. Everyone acknowledges that water trucking is unsustainable – but establishing a more effective, economical, and sustainable WASH infrastructure requires a level of capital investment and time that is often not available and neither politically acceptable nor fast enough to deal with an outbreak. The relative success in combatting cholera between 2014 and 2019 potentially contributed to reduced investment, such as the availability of standby supplies (also influenced by a shift to more cash and local purchasing), in maintaining preparedness in the face of other demands for funds.

Funding was seen as a key limitation, and respondents noted that it was easier to articulate the costs and value of a health sector-based response to an outbreak than for WASH. WASH is still seen more as a long-term investment, and lacks a clear 'tool' for donors to easily attach funding to, such as a vaccine programme and the establishment of cholera treatment centres. Some respondents argued that a dedicated fund that would enable rapid WASH response could make a significant difference, both for immediate funding needs and in incentivising agencies to develop and maintain their response capacities. Given the well documented favourable cost-benefit analysis of WASH interventions and returns on investment, the argument for a new source of dedicated funding is compelling.[30]

3.3 "We are always late": Operational coordination and capacity for rapid response

Coordination and response capacity issues are often linked. In terms of capacity, interviewees reiterated that the reality in most crisis settings is that the level of humanitarian capacity is generally very low relative to needs – too low to fill the gaps in national capacity it is there to fill. This would be true of any outbreak. When it comes to coordination, agencies that lack full-funded capacity and programming presence on the ground are not well placed to coordinate the efforts of others. In the words of an interviewee from the Syria cholera response: "There isn't sufficient confidence. At the end of the day, UNICEF and WHO need to come together and put together a stronger package in response, and be more convincing that they have the epidemiology to back up the message."

Interviewees stressed the importance of modelling established multisectoral engagement elsewhere, citing examples from Northeast Nigeria and Democratic Republic of the Congo (DRC). In the view of interviewees, response capacity was also linked to the setting, with highly populated urban settings seen as more problematic. Ultimately, however, one respondent noted

[30] Varley, R.C., Tarvid, J. and Chao, D.N. (1998). A reassessment of the cost-effectiveness of water and sanitation interventions in programmes for controlling childhood diarrhoea. *Bulletin of the World Health Organization,* 76(6), pp. 617–31. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2312499/ ; Haller, L., Hutton, G. and Bartram, J. (2007). Estimating the costs and health benefits of water and sanitation improvements at global level. *Journal of Water and Health,* Dec;5(4), pp. 467–80. https://doi.org/10.2166/wh.2007.008

success in Syria as a result of deliberations in the joint cluster system in the country, "We can't reach 17 million people ourselves. But we work with the water truckers to put chlorine in the water tracking tanks. We work with 100 people, and then we reach 100,000 people. We need to work through other systems to leverage the cholera response."

Coordination and preparedness capacity are both necessary conditions of rapid response. Interviewees from several different contexts cited challenges with launching rapid response, especially in countries unaccustomed to dealing with cholera. "If we need four weeks to start a response and the first case was picked up a month earlier than that, then we are very delayed. A rapid response is effective, but we are always late." Another cited a possible "lack of memory".

The time required to launch response was seen as rising "up to 20 days, even for MSF", leading to the greater spread. Finally, harking back to competencies, it is clear that a general lack of staff experienced at dealing with cholera inevitably slows down response while the guidance is absorbed, and protocols learned or relearned.

Case-area targeted intervention approach

The case-area targeted intervention (CATI) approach to cholera involves targeting efforts to new outbreaks or hotspot areas with high incidence of cholera cases, rather than implementing a blanket response in the entire affected region. Using joint teams of health and WASH providers, services, materials, and information are delivered to cholera case households and neighbours in the immediate vicinity. This allows for a more focused and efficient use of resources, leading to a more rapid and effective control of the outbreak. While experts are quick to point out that more evidence is still needed to be certain of its effectiveness, studies to date have shown positive results, and the approach has gained increasing acceptance in humanitarian public health.[31]

CATI is best used at the early stages of an outbreak, when the incidence of cholera cases is still rising, and the source of the outbreak has not yet been fully contained. Because the aim is to quickly control and contain the spread of the disease, the earlier CATI is implemented, the more effective it will be. Using it during the later stages of an outbreak may still be beneficial but will have greatly diminishing returns. This is significant because the length of the epi curve for cholera is typically short, often just a few weeks. Use of CATI therefore demands the capacity for rapid deployment of teams. CATI also includes and relies on other measures, such as enhanced surveillance, improved water and sanitation systems, and increased access to OCVs, making it a resource-intensive as well as a time-limited intervention.

Like the vaccine, the CATI approach is not a silver bullet, and underlying capacity gaps may prevent it being used anywhere near at scale. Despite these caveats, use of the CATI approach could potentially help to bridge the part of the coordination and funding gap between short-term health and long-term WASH – and give WASH the specific "funding object" it currently lacks for donors.

Assumptions about behaviour: The need for detailed and nuanced analysis to shape risk communication and community engagement

It is well known that personal behaviour has a major impact on risk of exposure to cholera. However, there remains an over-focus on inputs – water stations and toilets – without a more nuanced understanding of disease transmission routes, or the beliefs and behaviours that enable this transmission. Oftentimes, people are blamed for their behaviours without a good

[31] Spiegel, P.B., Sikder, M., Altare, C., Doocy, S., Trowbridge, D., Azman, A. and Lantagne, D. (2022). *Retrospective case studies on case area targeted interventions for cholera epidemics.* Johns Hopkins Center for Humanitarian Health. http://hopkinshumanitarianhealth.org/assets/documents/RRT_CaseStudy_Report_2021_final.pdf

understanding of cultural context or constraints to people adopting more appropriate behaviours. For example, hand washing with soap is more straightforward when one has easy and affordable access to soap.

As we all witnessed during COVID-19, behaviour change is challenging. There can be many misconceptions circulating as to how cholera is contracted (and there is only one way – by ingesting particles of human faeces containing the pathogen), prevented, and best treated. To engage in effective RCCE requires detailed cultural knowledge and an understanding of attitudes and practices – yet these are often understudied.

RCCE remains underfunded, but with investment could make a significant impact on the efficacy – and therefore value for money – of other interventions. For example, post COVID-19, vaccine hesitancy remains high in some places, which risks undermining any cholera vaccine campaign, so this needs to be built into the distribution strategy.

3.4 Conflicting priorities: The elusive nexus in cholera programming

With its root causes in development and triggers in emergencies, cholera would seem the poster child for programming in "the nexus" between relief and development goals. However, as described in earlier sections, the intersecting divisions between health and WASH – seen in governments and in agencies alike, as well as on both sides of the relief/development split – presents obstacles to practical coordination.

Interviewees broadly referenced a common challenge across cholera responses, particularly in those that have a strong development framework. There was a tendency for WHO to play a relatively strong role in support of each respective ministry of health, leading to a health-oriented response. Overall, interviewees noted typically stronger roles of ministries of health in addressing cholera, with relatively clear response lines, while ministries covering water and other resources were seen as typically less powerful in government hierarchies and less likely to be emergency-oriented. A similar challenge was noted in the UN response. "In UNICEF, for example, the structure is a problem. The lead WASH person is usually a development person, and the relief people get short shrift."

A further challenge for WASH actors is that, while the responsibility for health generally sits with the ministry of health, water and sanitation can fall across multiple institutions such as planning, rural affairs and city municipalities – and these institutions may not necessarily see a disease outbreak as their problem to resolve. As an example, one actor in Lebanon noted, "The government does not have the capacity or the willingness to address the crisis. The aid community in-country has the capacity to support the government, but the biggest problem is this is not a pure humanitarian response. The way to address it is by working through government to provide basic services. We simply don't have counterparts in WASH – we don't have people to work with in the water department to address the problem efficiently and effectively." Thus, establishing institutional relationships and protocols for bringing in surge support in endemic areas in advance is even more critical, but often less developed than for the health sector.

Global experts in cholera reject as a false choice the question of emphasising emergency response-oriented vs development-oriented programming; both are needed. To paraphrase an interviewee, it is critical to keep the skills of response, but at the same time work to avoid repeated outbreaks. In terms of strategic planning tools, for instance, interviewees noted that there should be no excuse for HRPs and HNOs not to be fully aligned with common country assessments (CCAs) on the development side. As has been repeatedly observed over many years, the structural divides in the international aid architecture are underpinned and reinforced by donor funding modalities, discussed below.

4 External constraints and complicating factors

4.1 Reactive and inflexible funding

Investments in cholera control can be long-term (eradication and safe WASH infrastructure) or short-term (building preparedness and rapid response capacities for control) and aid funding portfolios ideally should include both. In most aid settings, however, neither type of investment takes place and funding for cholera is largely reactive, released upon emergency requests or grant modification proposals by aid agencies after an outbreak.

How to shift a larger portion of resources into prevention and preparedness activities or predictable, recurrent crises (like cholera) is an age-old problem in humanitarian action, and the fact remains that agencies have far more access to funding for response than for preparedness, let alone longer-term elimination activities. That most funding flows as bilateral grants does not optimise for health outcomes. Rather, it incentivises unproductive competition between agencies and works against the coordination that is critical for effective response.

On the development funding side, cholera has been deprioritised somewhat, a trend observed by one interviewee "even pre-COVID", and anti-cholera efforts in development settings suffer from the lack of flexibility of development funding. As the major international donors have increasingly earmarked their development funding against specific outcomes, it becomes extremely difficult for grants to be reallocated to address cholera outbreaks when they happen. Several interviewees spoke of the lack of adequate resources for WASH in development as part of the general funding neglect of SDG 6. UNICEF and others are exploring innovative, blended financing instruments for long-term WASH programming, similar to a bond where private investors pay for WASH improvements, but these are still in early development.

The reactivity of funding for cholera has perverse outcomes, as noted by a number of interviewees. As described by one, "Usually there are resources available for large outbreaks, but there are many smaller outbreaks that do not get the resources needed. We have not managed these smaller ones well, and until they get out of control then they do not attract the resources they need."

Other innovative financing solutions, such as trigger-based anticipatory funding mechanisms, are seen as a potential solution. One such mechanism is being tested for cholera in DRC and Mozambique, funded through the Central Emergency Response Fund (CERF), with the idea that funds are to be released as soon as an outbreak is detected, or cases reach a specific threshold. While still in the early days of piloting, there was a sense from those involved that such a mechanism could prove "perfect for cholera", providing of course that the capacities and competencies for execution are in place.

A true anticipatory mechanism is one that kicks into gear before any outbreak occurs, on the basis of likelihood. Triggers in this case would need to be linked to changes in the environment, before any cases are detected. One example could be the climatological forecasting mechanism using NASA satellite technology introduced in Yemen in 2018 to "precisely forecast high-risk regions based on environmental conditions observed from space".[32] Another might be wastewater monitoring systems that can detect outbreaks before they occur by monitoring the

[32] NASA. (2018, 27 August). *Investment in cholera forecasts helps save lives in Yemen.* https://www.nasa.gov/press-release/nasa-investment-in-cholera-forecasts-helps-save-lives-in-yemen

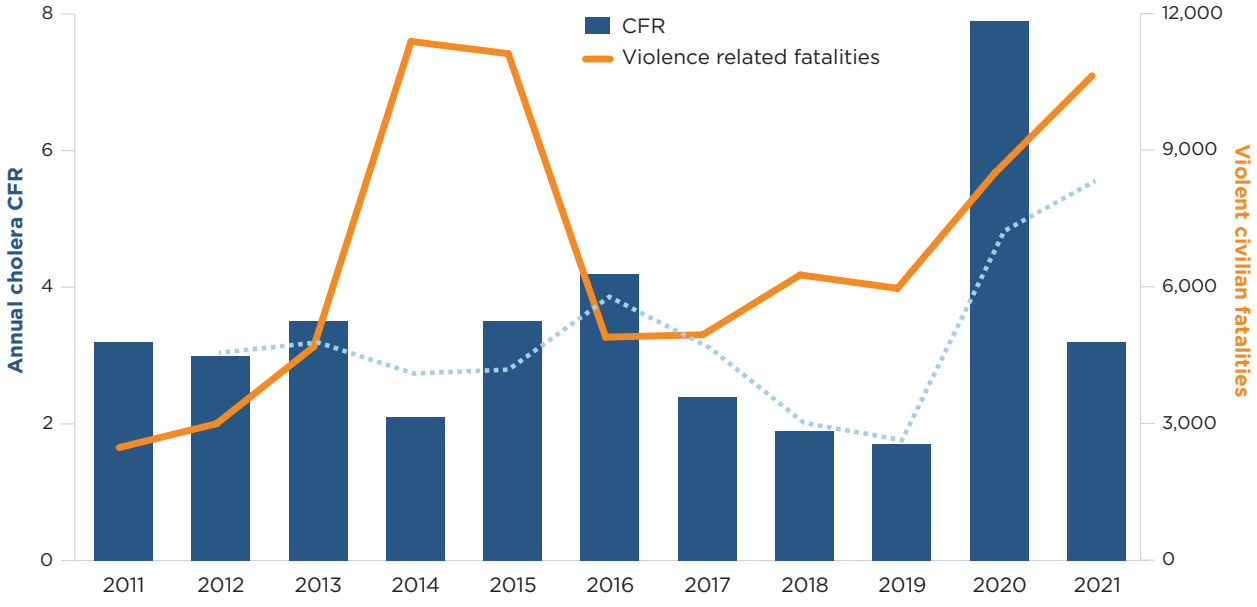
concentration of Vibrio cholerae O1. If it exceeds a certain threshold, it may signal an imminent cholera outbreak. These tools remain more potential than possible for humanitarian responses, and donors have not yet shown an appetite to invest in their development in a major way.

In the meantime, the country-based pooled funds in humanitarian settings, while still accounting for a small portion of overall humanitarian funding in crises, are also providing alternatives to the reactivity and inflexibility of funding. Millions have been allocated this way for cholera response in countries like Syria. Other humanitarian funding tools include standby agreements negotiated between donors and implementers for cholera responses that are activated by specific triggers, provisions for grant modifications (building flexibility into pre-existing agreements to accommodate an unforeseen event like a cholera outbreak), and Start fund grants and other mechanisms for small but rapid additional funding to allow a response to be launched. Contributing more through common funding mechanisms is a viable alternative for donors to make fast and flexible funding more available for emergent needs like cholera outbreaks.

4.2 Insecurity, access impediments, and the after-effects of COVID-19

Self-evidently, if responders and patients are not able to move freely due to the risk of conflict or criminal violence, if they require clearance or express permission to enter certain areas, or if their facilities and vehicles are targeted by bad actors, response efforts will be delayed, and outbreaks allowed to grow. In Haiti, the potential for gang violence to disrupt the cholera response and lead to an explosive epidemic was so strongly felt that it was a major impetus to discussions on the possibility of a new international intervention force at the Security Council. The worsening of the armed conflict in northeast Nigeria, as measured by an increase in civilian conflict-related fatalities, corresponded to an upswing in cholera case fatality rates (Figure 5). Although cholera is present in several states, outbreaks in conflict-affected Borno and Yobe have been particularly severe.

Figure 5: Violence and cholera case fatality rates in Nigeria, 2011–2021



Source: WHO (2021); ACLED (2022)[33]

[33] ACLED. (2022). *Data export tool.* Retrieved February 2, 2023 from https://acleddata.com/data-export-tool/

The COVID-19 pandemic was seen as having both positive and negative effects on capacities and resources to respond to cholera effectively. On the one hand, it has left health systems, ministries and organisations stretched, exhausted, and struggling to cope with new and additional priorities. On the other, interviewees also noted some positive effects from a renewed focus on capacities for testing and RCCE. Some of the structures and personnel put in place for COVID-19 can be repurposed for other epidemics, including cholera.

4.3 A shortage of vaccines

OCVs are one element of the broader multisectoral prevention and response to cholera outbreaks, helping to buy time to prevent further transmission alongside WASH and behavioural interventions. However, there is currently a critical shortage of vaccines.

As of this writing, only two of the three WHO pre-qualified OCVs are available for mass vaccination campaigns: Shanchol (produced by Sanofi in India) and Euvichol (produced by EuBiologics in the Republic of Korea). Sanofi decided to cease production more than two years ago (at least in part due to the lack of profitability of manufacturing OCV), with its supply ending at the end of 2023, although it has offered to transfer the technology to interested producers.

The shortage of vaccines has come unexpectedly to many given the market shaping report produced by Gavi in 2018 (an update to the report is yet to be issued). With the current shortage of vaccines, their use as a preventive element is relatively limited. Having only one company producing vaccines also carries an inherent risk of a single point of failure. The Coalition for Epidemic Preparedness Innovations (CEPI)'s mission to "accelerate the development of vaccines against epidemic and pandemic threats so they can be available to all people in need"[34] makes it well placed to work with its partners to produce more pre-qualified vaccines to fill the gap and to invest in research and development for other effective cholera vaccines.

Given the vaccine shortage, the International Coordinating Group (ICG), which manages emergency supplies of various vaccines, took the decision in October 2022 to temporarily suspend the standard two-dose vaccination regimen in cholera outbreaks and to authorise single-dose schedules instead.[35] The move was intended as a short-term solution until vaccine production can be increased. While EuBiologics is increasing production, there will still be a significant shortage in the number of vaccines in the years to come. South Africa-based Biovac signed a contract with the International Vaccine Institute (IVI) in November 2022 to manufacture an OCV.[36] The technology transfer will begin in January 2023, but the time required for clinical trials, licensing, and WHO pre-qualification certification mean that the vaccines will be available only around 2027.

While the shortage of vaccines remains a preoccupying concern, they are not 100% effective at preventing cholera. In addition, there can also be practical challenges and delays in getting vaccines to cholera hotspots, and their introduction in the 1990s also raised the risk of inducing a false sense of security among publics and responders alike.

[34] See: https://cepi.net/about/whyweexist/

[35] WHO. (2022, 19 October). *Shortage of cholera vaccines leads to temporary suspension of two-dose strategy, as cases rise worldwide.* https://www.who.int/news/item/19-10-2022-shortage-of-cholera-vaccines-leads-to-temporary-suspension-of-two-dose-strategy--as-cases-rise-worldwide

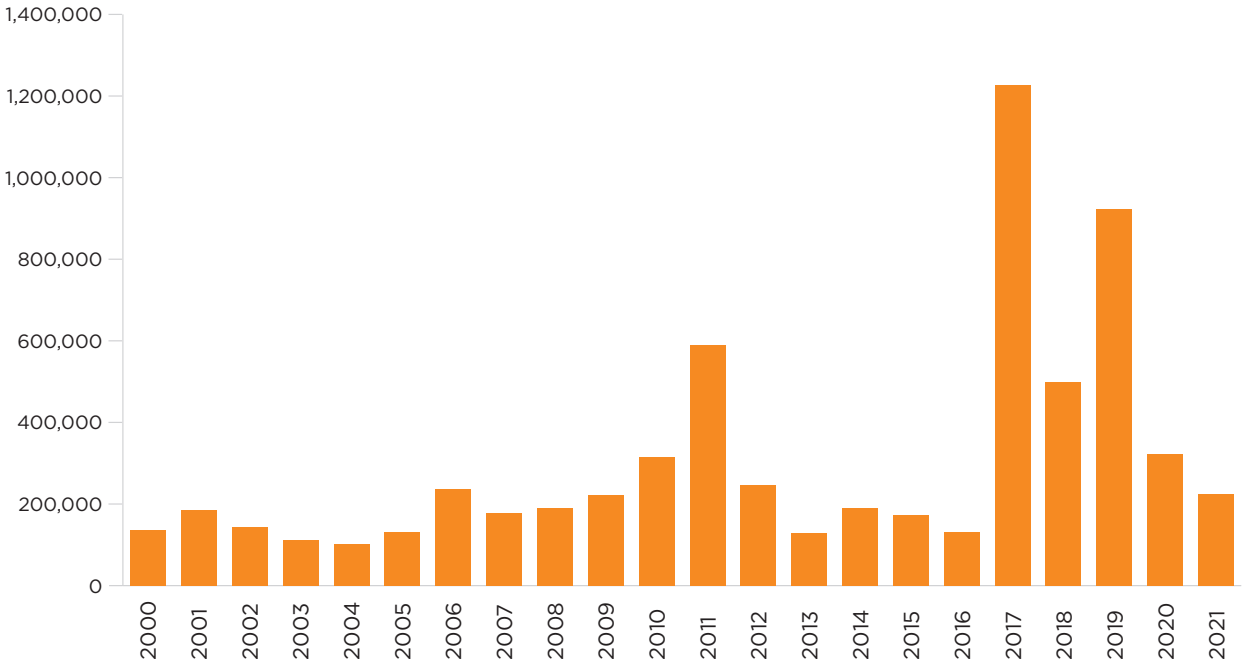
[36] Biovac. (2022, 23 November). *Biovac signs deal to develop and manufacture oral cholera vaccine for African and global markets.* https://www.biovac.co.za/wp-content/uploads/2022/11/Biovac-IVI-OCV-Technology-Transfer-Press-Release-23-Nov-2022.pdf

5 Data gaps

Good and timely data is important for all humanitarian interventions – and particularly for cholera response. Measuring the scale and distribution of cholera cases informs decisions on resource allocation and response efforts; monitoring outbreak trends and transmission patterns over time enables effective interventions. In many humanitarian contexts, it can also be a very heavy lift. Challenges in data collection and sharing were cited as persistent hindrances in cholera response.

At the central level, WHO compiles global cholera statistics through its worldwide network of national and sub-national surveillance systems. The data is reported by WHO member states, and WHO then collates and analyses the information to produce global estimates of the burden of cholera. Global data therefore reflects the combined quality of the national-level data, which can vary widely. In some cases there can be incentives for overreporting. The extraordinarily high global case numbers reported in 2017 (Figure 6), were driven by Yemen, and are suspected to be inflated as a result of a World Bank decision to provide stipends to health workers who were engaged in cholera response, thus incentivising the mislabelling of many non-cholera diarrhoeal disease cases. Guidance that recommends treating all suspected cases as cholera once an outbreak has been declared can also contribute to inflated numbers.

Figure 6: Global cholera case counts, 2001–2021



Source: WHO (2021)

Underreporting is also a common risk in country case data, as outbreaks can entail stigma and have economic effects related to food exports and other consequences.

At the operational level, surveillance requires significant manual data input, and is limited by the same capacity constraints that affect the sector as a whole. Many informants cited the lack of access to real-time data as negatively affecting current responses. Earlier alerts in Malawi, some said, could have allowed for quick CATI interventions and prevented the outbreak from sweeping across the whole of the country. DRC responders similarly spoke of lack of early case data. Depending on the context and the agency, responders described pulling data from a variety of data sources, including the national or local government's systems, WHO, Médecins sans Frontières (MSF), and in some cases their own data-gathering efforts. Multiple overlapping data surveillance systems seemed the norm in humanitarian contexts.

Sharing data in real time is critical in an outbreak – but multiple interviewees attested to the fact that this is not happening systematically. Data privacy and other issues can cause delays, but there were also reports of withholding and unnecessary obstacles to sharing between agencies and across sectors.

From another standpoint, there are those who argue that rapid intervention should not be in thrall to perfect data, and there is a risk of overemphasising data to the detriment of proactive response. An alternative approach encouraged by the Integrated Outbreaks Analysis platform, hosted by UNICEF, is to take a "good enough" approach to data and make decisions based on risk. For example, in eastern DRC they monitored a sharp increase in diarrhoeal disease after the eruption of Nyiragongo and concurrently witnessed very poor sanitary conditions. Unsurprisingly, cholera soon surfaced. Where there are obvious trigger indicators such as this, some argue a timely response based on risk factors is likely to save more lives than one that waits for more detailed epidemiological data. This perspective holds that agencies need to be more willing to use a range of data sources, even if below the standards they would wish for, but make use of what available data there is, including community-based data, to make intelligent risk-informed decisions.

6 Areas for action and investment

The unacceptable rate of cholera deaths in recent years has multiple complex causes, including weaknesses in humanitarian coordination, competencies, and capacities. The following are areas in which the humanitarian sector could potentially make investments to help change the trajectory.

Improving basic competencies: At the outbreak level, responders need to ensure that the skills and capacity exist for the provision of ORT at community level in order to respond to the majority of those with cholera who do not require more medicalised interventions. This entails support for training and retention of skills in treatment, case management and tracing, and RCCE efforts that emphasise the preferability of simple treatment at or close to home (to push back against the preference for unnecessary IV or antibiotic therapy), and the ready availability of packets of oral rehydration salts at every level of the system.

Coordinating more effectively: More deliberate efforts – from all sides – need to be made to ensure complementarity between humanitarian and nationally-led coordination structures to avoid overlaps and gaps in responses to cholera. The forthcoming pandemic instrument being negotiated by WHO member states presents a further opportunity to ensure that any foreseen coordination structures and approaches to cholera involve and build on the work of humanitarian actors. Meanwhile, it is the responsibility WHO and UNICEF, as the key global cluster leads, to clarify, deconflict, and strengthen their joint coordination role in cholera response. This requires ensuring adequate capacity to have dedicated coordination staff deployed in outbreak countries to implement the Joint Operational Framework and ensure effective programme integration.

Building regional level capacities: To operationalise the global strategy within national cholera plans, countries struggling with cholera outbreaks require technical support in epidemiology and response coordination resources. Given the challenges for central level coordination of the rising global cholera case load, donors and public health entities might consider developing non-UN-based, cholera-specific surge capacity within existing health centres situated at the regional level, such as Africa CDC, with a strategic focus on monitoring and preparedness for hotspot areas, where most outbreaks and deaths occur.

Investing in better data, and ensuring it is shared: A major effort is needed to improve data gathering and data sharing to improve cholera surveillance and provide a more effective response. In addition, investments in building the evidence to understand the role of WASH intervention in outbreak response, such as within the CATI approach, would enable the development of a shared set of operating procedures and guidance. Using data not just to identify where outbreaks are, but also which population groups are contracting the disease and routes of transmission in different contexts, allows for interventions and messaging to be targeted for greatest effect. When initiating a response, detailed studies of behaviours and attitudes should be standard, to inform nuanced and specific RCCE.

Making funding more flexible and risk-responsive: It warrants restating that cholera elimination will require longer-term investments in WASH and health programmes to break the cycle of recurrent outbreaks. This would mean breaking the current mould of bifurcated relief/development funding, and instead making plans against outcomes and financing them

accordingly. In the meantime, there is a pressing need for advance, or immediately available, funding to launch rapid responses to outbreaks. Donors should continue to increase flexible financing with 'crisis modifiers', allowing for funding streams that are not strictly humanitarian to be instantly reprogrammed for emergency interventions. If the anticipatory action efforts of CERF continue to show promise, they should be further expanded to enable quicker responses when there are suspected cholera outbreaks. Increasing the proportion of funding through country-based humanitarian funds and other pooled fund instruments could also help to make more rapid funding available for cholera. Donors should incentivise multisector response, in support of joined up coordination and action. Finally, additional funding for vaccine production should also be urgently prioritised to overcome the critical shortage.

Increasing vaccine availability: The shortage of OCVs following the cessation of production by Sanofi has severely impacted the recommended two-dose vaccination regimen and the availability of the vaccine for prevention and response. An additive intervention that should complement WASH and cholera case management (rehydration) activities, vaccines are an effective tool in cholera control, but greater production is urgently required. Gavi can play a critical role in focusing attention on this shortage by updating its market shaping report for OCV. Additionally, Gavi, working together with pharmaceutical companies, donors, UN agencies, NGOs, and national governments, should prioritise finding ways to rapidly increase production of the vaccines, including by encouraging the involvement of CEPI. Without a further increase in vaccine production by EuBiologics and others beginning to produce vaccines sufficient for the two-dose schedule, the general lack of availability of vaccines will continue to leave responders at a disadvantage in the fight to prevent and respond to cholera. Concerted advocacy is needed to prioritise an urgent increase in vaccine production.

A final note: As a waterborne disease, cholera is different from other contagious diseases in that it requires a wider series of interventions to create or restore safe water and sanitation to stop outbreaks. And due to its rapid onset and severity of symptoms, it is different from other diarrhoeal diseases in the primary necessity of timely, proximate, and appropriate rehydration therapy to save lives. These features warrant a specific and individuated approach to cholera in health systems and aid bodies. While acknowledging the reality that cholera is but one of many deadly diseases that must be managed with finite resources and competing priorities, if cholera control is to be effective, it requires sustained efforts to retain skills and preparedness, not reactivity.

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Appendix A: People interviewed*

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Simone Carter, Lead, Integrated Outbreak Analytics, UNICEF

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Hanalia Ferhan, Emergency Director, ACTED

Dorismond Joseph Fils, Coordinator, Action Pastorale pour le Développement Humain

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Tom Handzel, Global WASH Coordinator, Center for Global Health (CGH), Centers for Disease Control and Prevention (CDC)

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Yousaf Jogezai, Country Director, Concern Worldwide

Raoul Kamadjeu, MD, Health Specialist, Public Health Emergencies, UNICEF

* Does not include off-the-record consultations.

Lilian Kiapi, Director of Country Support, Health Unit, International Rescue Committee (IRC)

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Houssam Youness, WASH Project Coordinator, Development for People and Nature Association (DPNA)

Appendix B: Meta-review

B.1: Meta-review summary figures

Figure B.1.1: Study type breakdown

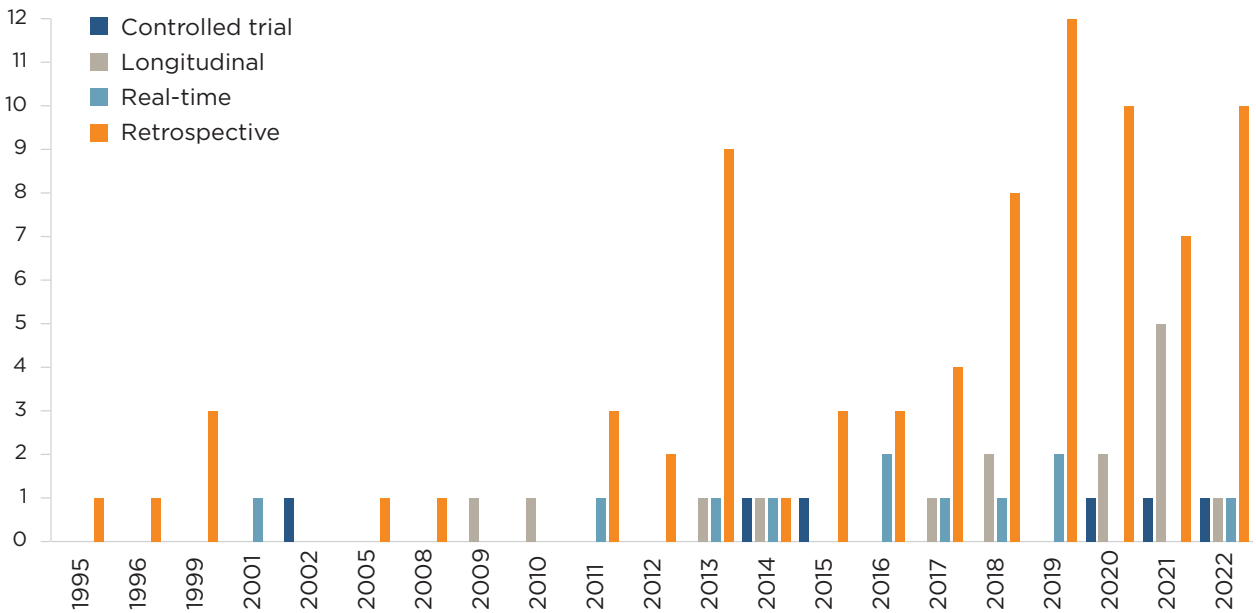


Figure B.1.2: Score totals by category

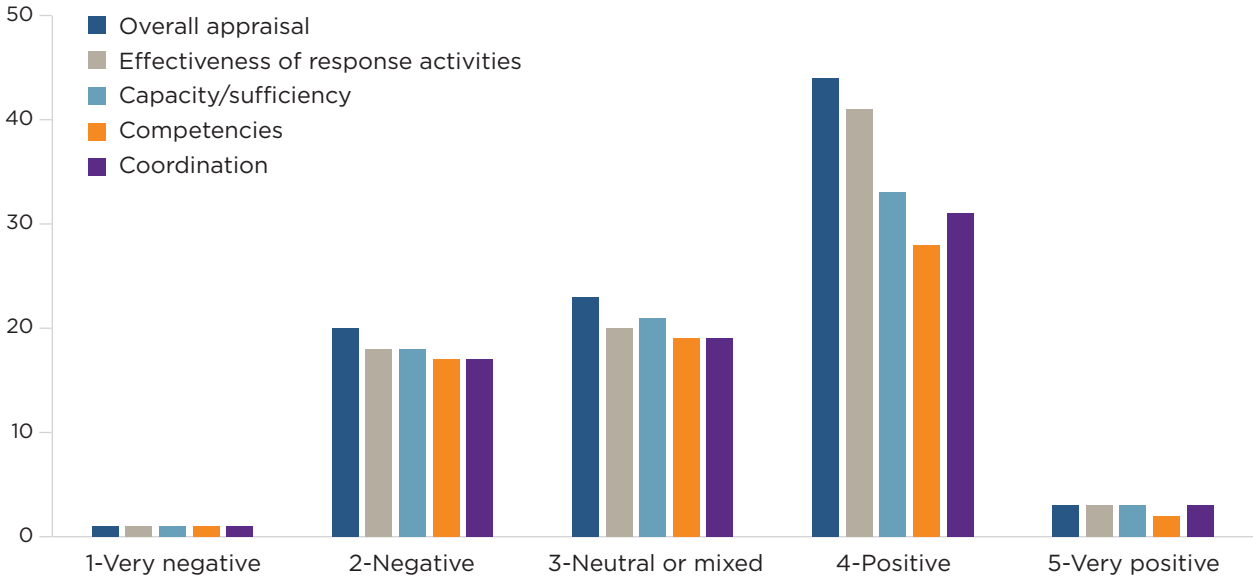
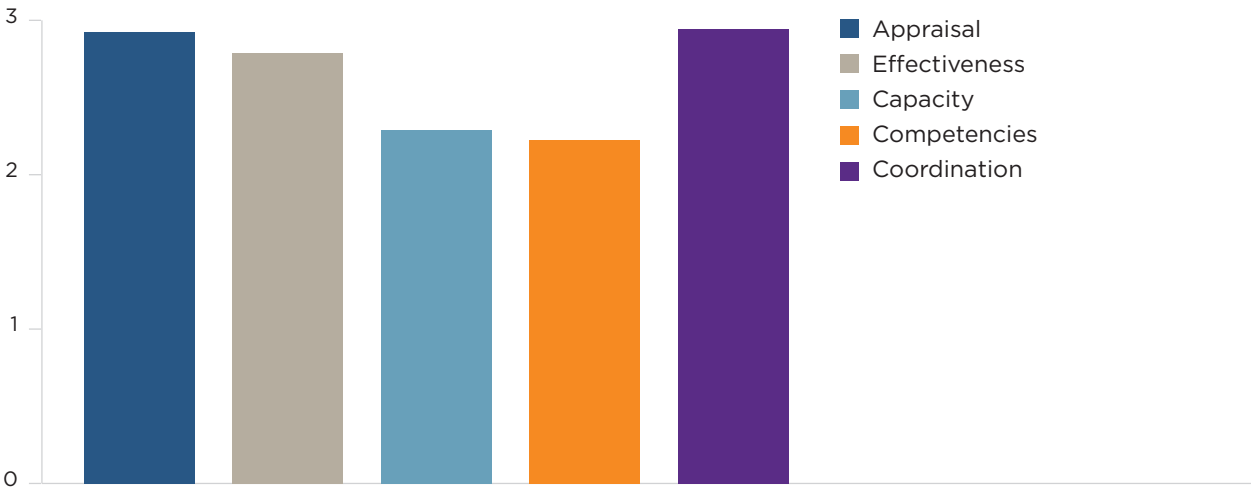


Figure B.1.3: Score averages by category



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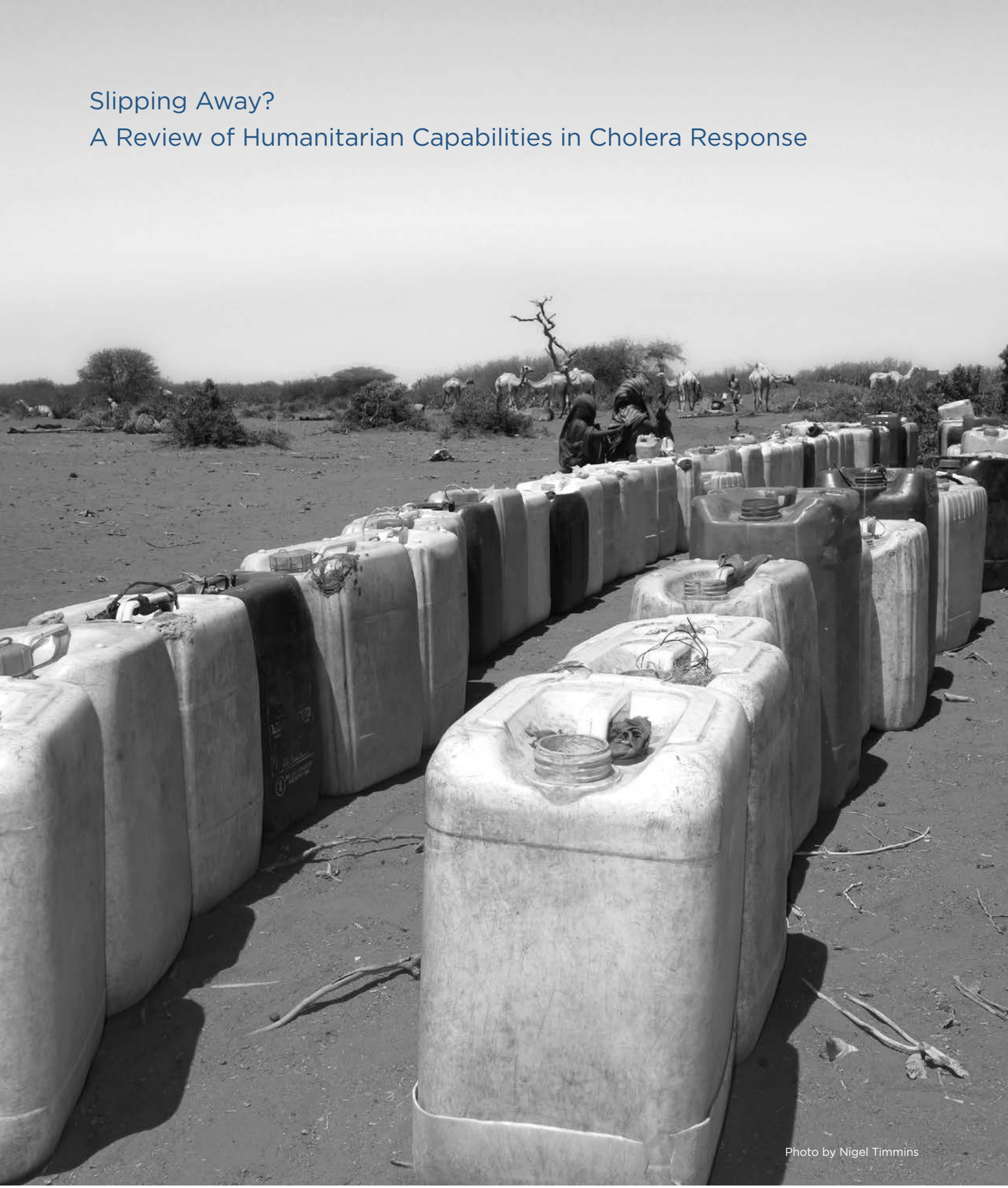
Slipping Away?
A Review of Humanitarian Capabilities in Cholera Response



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