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Abstract

Background: Somalia reported repeated cholera outbreaks between 2017 and 2019. These outbreaks were attributed to multiple risk factors which made response challenging.

Aims: To describe lessons from the preparedness and response to the cholera outbreaks in Somalia between 2017 and 2019.

Methods: We reviewed outbreak response reports, surveillance records and preparedness plans for the cholera outbreaks in Somalia from January 2017 to December 2019 and other relevant literature. We present data on cholera-related response indicators including cholera cases and deaths and case fatality rates for the 3 years. Qualitative data were collected from 5 focus group discussions and 10 key informant interviews to identify the interventions, challenges and lessons learnt from the Somali experience.

Results: In 2017, a total of 78 701 cholera cases and 1163 related deaths were reported (case fatality rate 1.48%), in 2018, 6448 cholera cases and 45 deaths were reported (case fatality rate 0.70%), while in 2019, some 3089 cases and 4 deaths were reported in Somalia (case fatality rate 0.13%). The protracted conflict, limited access to primary health care, and limited access to safe water and proper sanitation among displaced populations were identified as the main drivers of the repeated cholera outbreaks.

Conclusions: Periodic assessment of response to and preparedness for potential epidemics is essential to identify and close gaps within the health systems. Somalia's experience offers important lessons on preventing and controlling cholera outbreaks for countries experiencing complex humanitarian emergencies.

Keywords: cholera, disease outbreaks, emergencies, Somalia

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Introduction

Cholera is a disease of inequity, and it affects the world's most vulnerable and marginalized communities. It is an epidemic-prone disease of global importance (1). The global burden of cholera is unknown because of underreporting (2), but an estimated 3–5 million cholera cases every year cause 100 000–120 000 deaths (3). In the WHO Eastern Mediterranean Region, cholera remains a public health concern, especially in countries facing complex emergencies. In the past decade, 14 out of the 22 countries in the region have reported cholera cases, and the numbers have reached epidemic proportions. The regional burden of cholera is difficult to

capture because of the weak surveillance systems and underreporting of cases (4). Nevertheless, the number of cases is estimated to be around 188 000 a year (3). In Somalia and other counties in the Horn of Africa, cholera outbreaks are spreading at an alarming rate and affecting communities already suffering from conflicts and droughts (5). Controlling cholera is crucial to achieve the Sustainable Development Goals which call for the good health and well-being of all and a reduction in inequity (6).

Cholera is a multifactorial disease occurring and re-emerging frequently as a result of interactions between different risk factors (7). Identified risk factors fall into 4 main categories: (i) factors related to water and sanitation such as lack of rainfall and decreased vegetation cover (8), flooding leading to contamination of water sources (9), insufficient clean water and poor sanitation facilities because of inadequate infrastructure (10), and poor sanitary practices by communities at risk of cholera infections (11); (ii) sociodemographic factors such as poverty, overcrowding and living in camps for refugees or internally displaced persons (12); (iii) behavioural factors such as open defecation and unhygienic funeral practices such as washing the bodies of those who have died from cholera without wearing protective clothing (13); and (iv) gaps in knowledge and false beliefs about cholera infection and transmission, oral cholera vaccines, and cholera case management (14).

In Somalia, the protracted conflict, drought and flooding have caused over 2.6 million people to live in camps for internally displaced persons where access to safe water is limited and sanitation is poor (15). Cholera is endemic in the country and outbreaks occur during dry and rainy seasons.

Most of the country, particularly the regions of Shabelle and Juba, is prone to flooding about twice a year leading to contamination of water sources.

In 2017, Somalia experienced severe drought that affected over 60% of the country and led to severe water and food shortages (16). It was estimated that more than 3 million people were at risk of starvation and malnutrition (17). The limited access to safe water and poor sanitation conditions contributed to Somalia’s worst cholera outbreak in a decade (2,18–20). In January 2017, the Federal Ministry of Health confirmed a cholera outbreak in the Hiran Region following the isolation of Vibrio cholera, serotype Ogawa from stool samples of suspected cases. The epidemic spread rapidly to most districts and regions of Somalia and reached its peak during May and June 2017 (19).

This paper describes the main challenges faced by Somalia during the 2017–2019 cholera outbreaks, highlight Somalia's response to those challenges with the support of WHO and other partners, and documents lessons learnt. The paper provides guidelines on how to better prepare for future outbreaks in Somalia and other countries with complex humanitarian emergencies and poor operating environments.

Methods

We undertook a literature review specific to Somalia of available information on the cholera outbreaks of 2017–2019 with particular reference to: preparedness and response; focus group discussions and key informant interviews; and interpretation of the cholera-related indicators in the 3 years of the outbreaks.

Literature review and cholera indicators

The qualitative and quantitative review was undertaken to analyse decision-making, policy, and actions taken during the 2017–2019 cholera emergency in Somalia. The literature search included cholera preparedness and response plans, surveillance records, monitoring and evaluations reports, needs assessments reports, meeting notes, presentations, internal reports, peer-reviewed articles, and relevant grey literature. The data on key indicators including cases, deaths and case fatality rates (CFRs) were collected from the surveillance records of Somalia's Early Warning and Response Network Surveillance System (EWARN) (21), WHO's Global Health Observatory and published records (2,18), and cholera situation reports by the WHO Regional Office for the Eastern Mediterranean (19,22). The data were summarized and changes in the indicators over time are presented.

A cholera case was defined as a suspected case with V. cholerae 01 and O139 confirmed by stool culture. The cholera CFR was defined as the proportion of cholera-related deaths among total cholera cases during 2017–2019 and was expressed as a percentage.

Focus group discussions and key informant interviews

Participants for 10 key informant interviews and 5 focus group discussions were selected purposively based on their prominent roles in the health services, and/or their acknowledged understanding and custodianship of the healthcare system. The key informant interviews and focus group discussions helped provide in-depth information/perspectives for the qualitative review.

Nineteen participants from 8 regions in Somalia were included in the focus group discussions,

which were held in Mogadishu in 2017 by a trained interviewer who guided the discussion based on pre-identified themes. The interviewer encouraged participants to express their thoughts and ideas freely without interruptions. Pre-identified themes for the focus group discussions included: outbreak detection/confirmation; organization of response; use of reactive oral cholera vaccines; information management; case management; mortality reduction; hygiene measures at the health facility level; involvement of the community to reduce the effect of the disease; surveillance; funeral practices; and 3 themes related to control of the environment – safe water, safe food and sanitation.

The key informant interviews were conducted in 2019 mainly with senior staff of the Federal Ministry of Health and with department heads at relevant international institutions who had extensive knowledge of their organization's involvement in the cholera response.

The focus group discussions and key informant interviews were audio-recorded and transcribed separately by 2 researchers. The transcribed data were analysed thematically by a researcher who was blind to the aims of the focus group discussions and key informant interviews.

Results

Cholera outbreaks in Somalia

In East Africa, particularly the Horn of Africa, and the Middle East, large cholera outbreaks with high mortality are frequently reported (18). The historic trend of cholera in Somalia has not been much studied (23). Although Somalia has long faced cholera outbreaks, the earliest record of a cholera outbreak appears in the WHO's Global Health Observatory for 1970 (18). For the past 3 decades, almost all small-to-large cholera outbreaks in Somalia coincided with outbreaks in different parts of the world including the Eastern Mediterranean Region. However, except for the small-scale outbreaks in 2008–2010 and 2014–2015, the cholera cases, deaths and CFRs in Somalia were higher than the corresponding global and regional averages.

On average in the decade 2010–2019, 22 505 cholera cases and 379 deaths (CFR 1.68%) occurred in Somalia, which is higher than the regional average of 16 918 cases and 133 deaths (CFR 0.79%) and the global average of 9765 cases and 95 deaths (CFR 0.97%). The higher values of the indicators can be attributed to 2 large cholera epidemics of almost similar scale in Somalia, in 2011 and 2017. Except for 2002, the cholera CFR in Somalia has always been higher than the global and regional CFR averages (2,18,19,22).

The 2017 cholera outbreak was the largest since 1970, with 78 701 cases and 1163 deaths,

mainly among children younger than 5 years. The outbreak was more widespread and more severe, encompassing 85 districts in 20 regions within the country, 9 of which were classified as partially accessible (urban areas were accessible but not villages) because of political conflict (2,19,22). The highest incidence was in Bay Region with 14 964 reported cases, while the lowest was in Sahil with only 3 cases reported (Figure 1 and Table 1). The overall CFR in 2017 was 1.48%. Of the 78 701 cases and 1163 deaths, 42 987 (56.42%) cases and 582 (51.86%) deaths were reported from the partially accessible regions (Table 1).

The highest peak of the 2017 outbreak was in epidemiological week 22 (29 May–4 June) when more than 5000 cases of cholera were reported. Thereafter, the number of reported cases declined gradually and reached its minimum of 144 cases during epidemiological week 47 (20 November–26 November). After that time, sporadic cases of cholera were reported during December 2017 (22) (Figure 2). This 2017 peak in cases was attributed to a series of unfavourable events that began with heavy rains which caused flash floods that led to contamination of water sources and displacement of communities to camps where access to safe water was limited and sanitation was poor. After the flash floods, drought occurred in parts of Somalia, which led to food insecurity and malnutrition among children and resulted in lowered immunity to waterborne infections. Communities did not have enough time to fully recover from each of these hazards, and this situation, together with the weak health system, contributed to the repeated cholera outbreaks with varying degrees of severity.

Cholera cases continued to be reported in 2018 and 2019 (19,22), but the total number of cases was much lower than in 2017 (Table 1 and Figure 2). In 2018, the cumulative total of cholera cases was 6448 with 45 associated deaths (CFR 0.70%) in 23 districts of the accessible (Banadir and Lower Shabelle) and partially accessible regions (Hiran, Lower Juba, Lower Shabelle, Middle Shabelle and Lower Shabelle) (19,22). In 2019, the cumulative total of cholera cases was 3089 with 4 associated deaths (CFR 0.13%) from 19 districts in Banadir Region and the partially accessible regions of Gedo and Lower Juba (19,22). Overall, the cholera outbreak that started in December 2017 up to December 2019 resulted in 13 818 cases and 72 deaths (CFR 0.52%), reported from 3 states of Somalia (Hirshabelle, Jubaland and South West) and Banadir Region (19,24).

Discussion

Preparedness, response and post-endemic activities collectively comprise three phases of effective cholera control (25). However, the level of preparedness is the most crucial phase of cholera control and essentially determines the success of an outbreak response (26). Therefore, we identified lessons learnt from the 2017–2019 cholera response in Somalia to provide recommendations on how to better prepare for and respond to future potential outbreaks in Somalia and other countries in humanitarian emergencies.

A combination of factors led to Somalia's severe 2017 cholera outbreak. Protracted conflict contributed to the weakening of Somalia's health system. Conflicts led to displacement of people to camps where access to safe water and sanitation is limited. Severe drought in 2016 and 2017 led to water shortages, displacement, food shortages and malnutrition in children younger than 5 years which in turn led to low immunity.

Our analysis of the cholera cases and deaths and the CFR shows that, despite many years of public health interventions, cholera is still a recurring and important risk to vulnerable communities in Somalia. In 2017, the country experienced the worst cholera outbreak in 5 years, with 78 701 cases and 1163 deaths, mostly among children younger than 5 years (18,19,22).

The Global Task Force for Cholera Control was established in 1991 and revitalized in 2011 as a result of the World Health Assembly resolution WHA64.15, which requested the WHO Director-General to strengthen WHO's work in this area (27,28). Later in 2017, this task force launched "Ending cholera: a global roadmap to 2030" and formulated a framework to achieve that target (6). In October 2017, a call to action to fight cholera through implementation of the global roadmap was made by 35 task force partners (27). Despite global efforts to end cholera in Somalia, cholera outbreaks are still reported as the conflicts continue. Therefore, reassessment of cholera preparedness and response plans is important to achieve the goal to end cholera by 2030.

Several countries with complex emergencies have experienced repeated cholera outbreaks and successfully implemented response activities and interventions with the support of WHO and other partners. However these efforts faced challenges and obstacles (29–31). Although Somalia faces a similar situation (19), the humanitarian crisis in Somalia is characterized by multiple hazards occurring in quick succession without any time for full recovery from preceding hazards. Recognizing these challenges and exploring Somalia's experiences is important to identify and bridge gaps within the current surveillance and response systems at both national and subnational levels. EWARN was launched in Somalia in 2010 but collapsed during the conflict. Until 2017, no reliable surveillance system existed for timely detection of cholera and other epidemic-prone diseases. With the support of WHO, EWARN was re-activated in 2017 to provide timely detection and response alerts for cholera (32).

We identified several important challenges including: a weak health system; fragile water, sanitation and hygiene (WASH) infrastructure; difficulty in obtaining real-time information; poor

resources; and limited funding. However, the most important challenge was conflict, which was responsible for all the other challenges. With support of WHO and other partners, Somalia was able to overcome these challenges and successfully responded to the cholera outbreaks in 2017–2019. However, these outbreaks will not be the last; therefore, continuous support is vital for the prevention and early detection of, rapid response to and containment of future outbreaks.

Successful interventions that were implemented and contributed to the effective management of the cholera outbreak included: efficient leadership and coordination of epidemic preparedness and response plans at all levels; timely detection and response to alerts; timely dissemination of epidemiological information that was useful for public health action; comprehensive risk assessment; proper case management; enhancement of surveillance and laboratory capacities; strengthening of WASH preparedness; campaigns for community engagement, risk communication; and implementation of campaigns for preventive oral cholera vaccination. The impact of these interventions was evident by the reduction in the total number of cholera cases reported from 78 701 cases in 2017 to 6448 cases in 2018 and 3089 cases in 2019. Similarly, the CFR declined from 1.48% in 2017 to 0.70% in 2018 and 0.13% in 2019.

Based on the forecasting exercise conducted in Somalia in 2018, the total number of reported cases in 2018 was 37.08% less than the best case scenario in which 17 389 individuals were suspected to have cholera the same year. Similar successful experiences were reported from other countries such as Haiti which succeeded in controlling the cholera outbreak following the 2010 earthquake by prioritizing investment in safe water supplies and improved sanitation (33).

Recommendations

Based on our assessment of the experience of responding to the cholera outbreaks in Somalia, the following recommendations are proposed for the country and other countries with similar contexts.

Strengthen coordination and leadership to review and update preparedness and response plans for cholera.

Integrate disease surveillance and response systems that include an early warning alert and response network to support timely detection of and response to any alerts of cholera and other epidemic-prone diseases.

Increase the number of people with access to safe water and proper sanitation through the establishment of sustainable water systems.

Raise awareness among communities in high-risk areas for cholera of the importance of adopting hygienic behaviour.

Perform continuous risk assessments to identify hotspots for cholera and make plans to implement preventive cholera vaccination campaigns.

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Riposte aux flambées épidémiques de choléra en Somalie entre 2017 et 2019

Résumé

Contexte : La Somalie a signalé des flambées répétées de choléra entre 2017 et 2019. Ces flambées ont été attribuées à des facteurs de risque multiples, ce qui a rendu la riposte difficile.

Objectif : Décrire les enseignements tirés de la préparation et de la riposte aux flambées épidémiques de choléra en Somalie entre 2017 et 2019.

Méthodes : Nous avons examiné les rapports décrivant la riposte aux flambées épidémiques, les dossiers de surveillance et les plans de préparation aux flambées de choléra en Somalie entre janvier 2017 et décembre 2019, ainsi que d'autres documents pertinents. Nous

présentons des données sur les indicateurs de riposte au choléra, y compris les cas de choléra et les décès qui y sont associés, ainsi que les taux de létalité pour les trois années. Des données qualitatives ont été recueillies auprès de cinq groupes de discussion thématique et dans le cadre de 10 entretiens avec des informateurs clés afin d'identifier les interventions, les défis et les enseignements tirés de l'expérience en Somalie.

Résultats : En 2017, un total de 78 701 cas de choléra et 1163 décès associés ont été notifiés (taux de létalité de 1,48 %) ; en 2018, ces chiffres s'élevaient à 6448 cas de choléra et 45 décès (taux de létalité de 0,70 %), tandis qu'en 2019, environ 3089 cas et quatre décès ont été signalés en Somalie (taux de létalité de 0,13 %). Le conflit prolongé, l'accès limité aux soins de santé primaires, à l'eau potable et aux infrastructures d'assainissement adéquates parmi les populations déplacées ont été identifiés comme les facteurs principaux dans les flambées épidémiques répétées de choléra.

Conclusion : Une évaluation périodique de la riposte et de la préparation face aux épidémies potentielles est cruciale afin d'identifier et de combler les lacunes des systèmes de santé. L'expérience de la Somalie offre des enseignements importants sur la prévention et la maîtrise des flambées de choléra pour les pays confrontés à des situations d'urgence humanitaire complexes.

2019 2017

WHO EMRO | Responding to cholera outbreaks in Somalia in 2017–2019

وخطط التأهب لتلك الفاشيات في الفترة من كانون الثاني / يناير 2017 إلى كانون
الأول / ديسمبر 2019 ، وغيرها من المؤلفات ذات الصلة . ونقدم بيانات عن مؤشرات التصدي
المتعلقة بالكوليرا، ويدخل في ذلك حالات الكوليرا والوفيات ومعدلات الوفيات من
الحالات المصابة خلال السنوات الثلاثة . وجُمعت بيانات نوعية من مناقشات خمس فرق
تنسيقية و 10 مقابلات مع مستجيبين رئيسيين للوقوف على التدخلات والتحديات والدروس
المستفادة من التجربة الصومالية .

: في عام 2017 ، أُبلغ عمّا مجموعه 78701 حالة كوليرا و 163 حالة وفاة مرتبطة بهاالنتائ **ج**
(معدل الوفيات من الحالات المصابة 1.48%) ، وفي عام 2018 ، أُبلغ عن 6448 حالة كوليرا و 45
حالة وفاة (معدل الوفيات من الحالات المصابة 0.70%) ، في حين أُبلغ في عام 2019 عن نحو
3089 حالة إصابة و 4 وفيات في الصومال (معدل الوفيات من الحالات المصابة 0.13%). والنزاع
الذي طال أمده قد قيّد إمكانية الوصول إلى الرعاية الصحية الأولية، وقلل أيضًا من
إمكانية حصول السكان النازحين على المياه المأمونة وخدمات الصرف الصحي المناسبة
بوصفها العوامل الرئيسية لتكرار فاشيات الكوليرا .

: التقييم الدوري للاستجابة للأوبئة المحتملة والتأهب لها أمر ضروريالاستنتاجات
لتحديد ثغرات النظم الصحية وعلاج تلك الثغرات . وتحمل تجربة الصومال دروسًا مهمة بشأن
الوقاية من فاشيات الكوليرا ومكافحتها لتستفيد منها البلدان التي تشهد حالات طوارئ
إنسانية معقدة .

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