



The devastating effect of cyclone Freddy amidst the deadliest cholera outbreak in Malawi: a double burden for an already weak healthcare system – short communication

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Abstract

Cholera outbreaks cause significant disease burden, especially in developing countries. While the disease is largely eliminated in developed countries, it still remains a huge burden to Sub-Saharan Africa. Lack of access to clean water, hygiene and sanitation facilities remains a huge risk factor for disease transmission and persistence. These outbreaks in Africa are usually associated with high case fatality rates. While many risk factors exist for the spread of the disease, climate change poses a huge challenge to the fight and spread of the disease. Most countries in southern Africa including Malawi and Mozambique have been experiencing the direct and indirect impact of climate change. Climate change can affect the epidemiological dynamics of multiple infectious agents, including vector-borne, water-borne, and food-borne pathogens. The aftermaths effects of flooding and droughts can largely be felt in seasonality changes in the spread of Cholera. Having an in-depth understanding of multiple factors that influence the patterns of spread of climate change related diseases combined with robust surveillance systems could help detect environmental changes in high-risk areas and result in early public health interventions that can alleviate potential outbreaks.

Keywords: Cholera, Malawi, Africa, Outbreak

Introduction

Cholera is an acute watery diarrhoea disease that is caused by the ingestion of food or water contaminated with the toxigenic strains of *Vibrio cholerae* serogroup O1 or O139. Cholera infection is often characterised by a rapid onset of watery diarrhoea, with or without vomiting and extensive dehydration^[1]. In Malawi, Cholera has been endemic since 1998 with seasonal outbreaks occurring especially in the rainy season. Since then, Malawi has experienced cholera outbreaks with high morbidity and mortality, particularly in the southern region which more vulnerable to flooding. The current protracted outbreak began in March 2022. It is the most widespread in the past ten years and

has affected a large population. This recent protracted Cholera outbreak came at a time when Malawi was battling with resurgence of Polio and the continued impact of the COVID-19^[2]. This further stretched the health care system, and the impact is widely felt. To make matters worse, the devastating tropical hurricane Freddy has added to the impact as the nation struggles with the outbreak. In this article, we highlight the impact of Climate change, in particular “tropical storm Cyclone Freddy” in Malawi during the deadliest Cholera outbreak and offer solutions for mitigating the dual burden to an already weak health care system.

The burden of cholera in Malawi

The cholera outbreak in Malawi is the deadliest in the nation’s history. Due to the disease’s widespread geographic distribution, the Malawian authorities declared a public health emergency on 5 December 2022^[2]. By the aforementioned date, the disease had spread to all the 29 districts of the country and claimed thousands of lives. The cholera outbreak emergency struck as Malawi was still reporting a higher-than-average number of COVID-19 cases while combatting a rebound of Polio infections. The said three infectious diseases have put considerable strain on the health surveillance system^[2]. Malawi’s position is like that of many other African nations, where the double burden of cholera and other infectious diseases like COVID-19 is felt in the majority of countries^[3].

Malawi had 51 568 cases and 1612 (CFR = 3.1%) from all 29 of its districts as of the 6 March 2023. Since 1 January 2023, 21 412 cases—or nearly half of all cases—have been documented, with 608 mortalities (CFR = 2.8%). There are presently cases in

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Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article.

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Annals of Medicine & Surgery (2023) 85:3761–3763

Received 25 March 2023; Accepted 10 June 2023

Published online 16 June 2023

<http://dx.doi.org/10.1097/MS9.0000000000000961>

13 countries in the African regions governed by the WHO. In 2023, Malawi will have reported 61% (21 412) of all cases, followed by Mozambique accounting for 14% (4979) and the Democratic Republic of the Congo surmounting 11.8% (4154). Malawi is responsible for 84% (608) of mortalities reported in 2023, followed by Mozambique at 4.7% (35), and Kenya at 4.3% (32), respectively^[4]. The disease was deemed of significant concern for public health, thus the government of Malawi implemented disease control and preventative measures to mitigate its dissemination and lessen the toll of the disease on the populace. Oral cholera vaccine consignments totalling 2.9 million have been delivered to Malawi as of 7 November 2022, and are currently being distributed to those in affected areas^[5].

The WHO, the United Nations Children's Fund (UNICEF), and other partners are assisting the Government of Malawi, through the Ministry of Health, to provide clinical care at special treatment centres located closer to communities, train healthcare professionals, improve water treatment systems, distribute necessary supplies, and raise awareness regarding hygiene practices and prevention techniques^[4].

The economic challenge and health system impact

The outbreak of cholera occurred at a time when Malawi's government was already experiencing financial difficulties due to a severe expenditure shortage. This economic burden may also be felt in the respective healthcare system, where many nurses and clinical officers remain unemployed. Most healthcare services in the system's outlying areas continue to be subpar. As most cases have been reported in remote and impoverished locations, this has made it extremely difficult to contain the outbreak. Through the ministry of health, non-governmental organisations like WHO, UNICEF, Médecins Sans Frontières (MSF), and others have played a vital role in hiring relief workers to aid in the fight against the outbreak^[4]. Despite all the efforts, the administration is still suffering tremendous hurdles when mitigating the outbreak. The healthcare system has been overburdened and requires significant assistance from external partners.

Cyclone Freddy—more than just deadly

It has not stopped pouring for Malawi despite the fact that the nation is currently grappling with the deadliest outbreak in a decade. As of 30 March 2023, more than 600 individuals lost their lives due to the impact of cyclone Freddy. The passage of the tropical cyclone Freddy weather system brought strong winds, mudslides and landslides to 15 districts in southern Malawi from 12 March, leading to death, displacement, destruction, and reduced or severed access by communities to essential services, including health care and education^[6]. This led to displacement of 659 278 people in 747 camps, including 336 252 women and 323 026 men. Health services were significantly affected by Freddy, with at least 83 health facilities damaged or destroyed^[6].

The tropical cyclone Freddy came at a time when the country was dealing with a big situation with Cholera outbreak. The health sector resources were largely stretched, with the tropical cyclone Freddy disrupting routine healthcare systems. This catastrophic effect of the dual burden of cholera and cyclone Freddy pushed Malawi to call for various stakeholders, international

organisations and well-wishers to join hands in rebuilding the nation and helping the affected communities.

Previously, climate change has closely been linked to the changes in patterns of spread of diseases. Diarrhoea diseases are among the most notorious disease linked to Climate change. An elevated incidence of diarrhoeal diseases is associated with higher temperatures (moderate/high confidence), heavy rainfall events and flooding (moderate confidence), heavy rainfall following dry periods (moderate confidence) and the displacement of people and/or the degradation of WASH services as a result of disaster (flooding or drought)^[7]. Disasters and displacement force affected communities to use a single water source, thereby increasing the risk of contamination. Malawi is a hotspot for Cholera outbreaks in Africa. The patterns of spread of the disease is closely linked with seasonal trends in rains and especially weather events such as abrupt and heavy rainfall^[7].

While the numbers of Cholera cases arising from the impact of this most recent tropical cyclone Freddy may not be clearly documented as of the present, it is more likely that Cholera cases may rise. The displacement of majority number of people to evacuation Camps, disruption of water, sanitation and hygiene facilities may likely lead to an upsurge in the number of Cholera cases and therefore persistent outbreak.

The protracted outbreak that Malawi is currently dealing with was worsened during the aftermaths of tropical cyclone Gombe and Ana in 2022^[8]. Similarly, tropical cyclone Ana led to the destruction of Water, Sanitation and Hygiene Facilities in the southern region of Malawi. The tropical cyclone Ana and Subsequently cyclone Gombe had battered the southern Region of Malawi, brought heavy rains and flooding to several districts. In the Districts of Machinga and Mangochi 19 cholera cases and 1 death were reported as of 17 March 2022 in the aftermath of cyclone Ana and Gombe^[8]. As of 26 April, four deaths and 78 cases had been reported to WHO, contributing to an estimated case fatality ratio of 5.1%. According to WHO, people from southern Malawi, who were displaced due to torrential rains and floods during late January–February 2022, did not have access to safe drinking water and sanitation services and, therefore, were at an increased risk of diseases such as cholera^[9].

The tropical cyclone Freddy has been more dreadful than the combined impact of cyclone Ana and Gombe in Malawi. Worse still, more Water, Sanitation and hygiene Facilities have been greatly destroyed and many hospitals in the southern Malawi have been affected. The destruction of Sanitation facilities may lead to increase contamination of water sources and increase risk of spread of Cholera Cases in Malawi. The community and healthcare system are more likely to experience cyclone Freddy's impact on the dynamics and trends of the outbreak for an extended period. The flooding in the southern region [of Malawi] has created conditions ripe for cholera spread and the situation is indeed cause for concern. The situation may further be worsened due to rise in cost of good quality foods and scarcity. Both Animals and crops have been damaged and the affected populations are largely depending on government and donor support. There is also high risk of cross border transmission as of the cases that are lately being recorded are from the neighbouring country Mozambique^[9].

Conclusion

The impact of climate change on disease spread in Malawi cannot be underestimated. Malawi has seen an upsurge in the number of reported Cholera cases in the aftermaths of tropical cyclone storms. It is therefore imperative for nation to direct its effort in dealing with both crisis; the Climate change and an upsurge of Infectious diseases. The country needs to strengthen its surveillance systems for both in country and across border transmission and also move toward alleviating the impact of climate change on disease transmission and dynamics.

Ethical approval

NA.

Consent

NA.

Source of funding

NA.

Author contribution

Conceptualization of ideas: all authors. Critical reviews with comments: all authors. Final Draft: all authors approved the final manuscript.

Conflicts of interest disclosure

N/A

Research registration unique identifying number (UIN)

N/A

Guarantor

Abubakar Nazir.

Data availability statement

NA.

Provenance and peer review

Not commissioned, externally peer-reviewed.

References

- [1] Sharmila T, Thomas TA. Pathogenesis of cholera: recent prospective in rapid detection and prevention of cholera [Internet]. *Bacterial Pathogenesis and Antibacterial Control* 2016:129–44.
- [2] Wise J. Cholera: Malawi is in grip of its deadliest outbreak. *BMJ* 2023;380:328.
- [3] Uwishema O, Okereke M, Onyeaka H, *et al.* Threats and outbreaks of cholera in Africa amidst COVID-19 pandemic: a double burden on Africa's health systems. *Trop Med Health* 2021;49:93.
- [4] World Health organisation: Cholera in the WHO African Region: Weekly Regional Cholera Bulletin: 8 March 2023; <https://www.afro.who.int/publications/cholera-who-african-region-weekly-regional-cholera-bulletin-1-march-2023-cloned>
- [5] World Health Organisation; Malawi launches oral cholera vaccination campaign to contain cholera. <https://www.afro.who.int/countries/malawi/news/malawi-launches-oral-cholera-vaccination-campaign-contain-cholera>
- [6] OCHA. Malawi: Tropical Cyclone Freddy - Flash Update No. 11 (31 March 2023); <https://reliefweb.int/report/malawi/malawi-tropical-cyclone-freddy-flash-update-no-11-31-march-2023>
- [7] IFRC. Climate change impacts on health: Malawi assessment; https://www.climatecentre.org/wp-content/uploads/RCRC_IFRC-Country-assessments-Malawi_Final3.pdf
- [8] World health organization: Tropical storms, flooding and Cholera: Malawi faces cholera emergency amidst severe climate events; <https://www.afro.who.int/photo-story/tropical-storms-flooding-and-cholera-malawi-faces-cholera-emergency-amidst-severe>
- [9] Sanjeet Bagcchi. Malawi takes on cholera outbreak amid cyclone devastation. *Lancet Microbe.* 2022;3:e480. [https://doi.org/10.1016/S2666-5247\(22\)00131-8](https://doi.org/10.1016/S2666-5247(22)00131-8)