

The persistent challenge of cholera in Africa: a complex interplay of factors

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INTRODUCTION

Cholera remains a formidable public health challenge across Africa, disproportionately impacting marginalized and vulnerable populations [1]. The disease's persistence underscores its multifaceted nature, rooted in more than just the biological characteristics of *Vibrio cholerae*. Instead, it reflects a complex interplay of environmental, social, economic, and systemic factors, each compounding the difficulty of effective prevention and control [1,2].

Africa continues to bear the highest burden of cholera globally, with recurring outbreaks that cause significant morbidity and mortality, often overwhelming already fragile healthcare systems [3]. The disease frequently strikes regions plagued by inadequate access to clean water, sanitation, and hygiene (WASH) infrastructure [3,4]. These deficiencies create fertile ground for the bacterium's proliferation, particularly in densely populated urban slums and rural areas with limited public health outreach. Climate change further exacerbates the problem, with extreme weather events such as floods and droughts creating conditions conducive to cholera outbreaks [5].

Social and economic inequalities also play a pivotal role in the persistence of cholera. Communities affected by poverty often lack the resources to adopt preventive measures or seek timely treatment, while stigmatization can hinder reporting and response efforts [6].

The situation is compounded by political instability and conflict, which disrupt public health services and impede emergency responses in affected areas. Despite decades of intervention, including vaccination campaigns, improvements in water and sanitation, and public health education initiatives, cholera remains endemic in several

African countries [2]. This persistent challenge reveals critical gaps in our prevention and control strategies. Many interventions have focused on short-term outbreak responses rather than addressing underlying structural vulnerabilities [4]. Furthermore, the global health community's limited focus on cholera as a neglected disease has hampered research and innovation [7]. As a result, Africa's cholera burden remains a stark reminder of the need for a comprehensive, multisectoral approach that combines robust surveillance, targeted vaccination, sustainable infrastructure development, and community engagement.

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Addressing these challenges requires collective action at local, regional, and international levels, ensuring that efforts are tailored to the unique epidemiological and sociopolitical contexts of each affected country. Only then can the persistent scourge of cholera in Africa be effectively mitigated.

DRIVERS OF CHOLERA IN AFRICA

One of the foremost drivers of cholera in Africa is the persistent lack of access to safe water and adequate sanitation. According to the World Health Organization (WHO), over 400 million people in Sub-Saharan Africa still rely on unimproved water sources, and over 700 million lack access to proper sanitation [8]. These conditions create an ideal environment for the proliferation of *Vibrio cholerae*, especially during rainy seasons when flooding exacerbates the contamination of water supplies [9]. In urban slums and rural communities, the interplay between rapid population growth, unplanned urbanization [10], and poor infrastructure amplifies the risk of cholera outbreaks. Yet, investments in water and sanitation infrastructure remain insufficient, and competing priorities, limited funding, and governance challenges hinder progress.

Poverty further exacerbates the cholera burden. Populations living in poverty are often forced to rely on contaminated water sources and are less likely to have access to health services. Malnutrition, common in low-income settings, weakens immunity, increasing susceptibility to cholera [6]. Additionally, the economic impact of cholera on households can be devastating, with affected families facing high out-of-pocket expenses for treatment and lost income due to illness. Governments and international organizations must address these socioeconomic determinants to break the cycle of cholera transmission.

Another critical issue is the inadequacy of disease surveillance systems. Many African countries struggle with delayed detection and reporting of cholera outbreaks due to weak health systems, limited laboratory capacity, and under-resourced public health infrastructure. This delay hampers timely response efforts, allowing outbreaks to spread unchecked [11]. Surveillance is further undermined by the stigma associated with the disease, leading to underreporting in certain communities. Strengthening real-time surveillance

and integrating cholera monitoring into routine health systems are essential to enable rapid response and containment [12].

Climate change is an emerging and intensifying driver of cholera in Africa. Rising temperatures and changing precipitation patterns have altered the epidemiology of waterborne diseases, including cholera [5]. Warmer waters promote the growth of *Vibrio cholerae* in aquatic reservoirs, while extreme weather events, such as cyclones and floods, disrupt water systems and increase vulnerability [13]. For instance, Cyclone Idai in 2019 triggered widespread cholera outbreaks in Mozambique, Zimbabwe, and Malawi, highlighting the interplay between environmental shocks and health crises. Policymakers must recognize climate change as a public health threat and incorporate resilience measures into cholera control strategies [14].

Community-level factors also play a crucial role in the persistence of cholera. Misinformation, cultural beliefs, and mistrust of health authorities can hinder prevention efforts. In some cases, traditional practices or reliance on unregulated water sources perpetuate transmission [15]. Public health campaigns often fall short of addressing these socio-cultural barriers, focusing narrowly on behavior change without engaging communities in meaningful ways. Effective community engagement and culturally sensitive interventions are vital to improving the acceptance and uptake of preventive measures [16].

AFRICA'S CURRENT CHOLERA CONTROL MEASURES

Moreover, the response to cholera outbreaks in Africa is frequently reactive rather than proactive. While emergency interventions, such as oral cholera vaccination campaigns and water treatment initiatives, have demonstrated success in reducing mortality, they do little to address the root causes of cholera [17]. Long-term, sustainable investments in water, sanitation, and hygiene (WASH) infrastructure are essential to prevent future outbreaks. However, these investments are often deprioritized in favor of short-term solutions due to political cycles, donor preferences, and limited resources. Policymakers must adopt a forward-looking approach that prioritizes structural improvements over temporary fixes [18].

The role of international organizations and donors in cholera control warrants critical reflection.

While their contributions have been instrumental in funding vaccination campaigns and emergency responses, they often focus on symptomatic relief rather than addressing underlying systemic issues. Additionally, donor-driven programs can create dependency and may not align with local priorities. There is a pressing need for African governments to take ownership of cholera prevention and integrate these efforts into national development plans. Donors should shift towards supporting locally-led, sustainable interventions rather than imposing externally designed programs [19].

In conflict-affected and fragile settings, cholera poses an even greater challenge. Countries like South Sudan, the Democratic Republic of Congo, and Somalia have experienced protracted cholera outbreaks exacerbated by displacement, lack of governance, and deteriorating health infrastructure [20]. Humanitarian responses in these contexts often struggle to keep pace with the scale of need, and cholera control is further complicated by insecurity and limited access to affected populations. Addressing cholera in these settings requires coordinated efforts that bridge humanitarian aid and development to rebuild health systems and infrastructure [21,22].

While developing and deploying oral cholera vaccines (OCVs) have been a major advancement [23], they should not be seen as a standalone solution. Vaccination campaigns must be complemented by robust WASH interventions to achieve lasting impact. Furthermore, global vaccine supply shortages have limited the reach of OCV campaigns, necessitating strategic prioritization and increased production capacity [24]. Research into next-generation edible cholera vaccines that provide longer-lasting immunity could also enhance the effectiveness of vaccination programs.

CONCLUSION

The persistence of cholera in Africa reflects a complex interplay of factors that transcend the health sector, encompassing environmental, socioeconomic, cultural, and systemic dimensions. Addressing this challenge requires a paradigm shift from reactive responses to comprehensive, proactive strategies that tackle the root causes of cholera. Governments must prioritize investments in WASH infrastructure, strengthen disease

surveillance systems, and engage communities meaningfully. International organizations and donors should align their efforts with local priorities and support sustainable interventions. Climate change adaptation and resilience must also be integral to cholera control strategies. Only through a holistic, multisectoral approach can Africa break free from the persistent grip of cholera and achieve sustainable health gains for its populations.

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