Epidemiology and Health System Journal
doi:10.34172/ehsj.26242 2024 Autumn;11(4):211-213 http://ehsj.skums.ac.ir

Letter to the Editor

Mitigating Cholera Outbreaks in Nigeria: Employing a Multifaceted Approach

Olusegun Ayo Ade-Adekunle[1*], Odunayo Olamide Ade-Adekunle[2], Seyi Ayomide Olaoba[3], Feranmi Olalekan Adekunle[1], Femi Johnson Adebayo[1], David Gbenga Babalola[1], David Ayodeji Oso[1], Hammed Abimbola Lawal[1], Miriam Ololade Umeh[4], Aishat Oluwatomiwa Mohammed[1], Damilola Peace Abiona[5]

[1]Faculty of Pharmacy, Olabisi Onabanjo University, Ogun State, Nigeria
[2]Department of Anatomy, Faculty of Basic Medical Sciences, Ondo State University of Medical Sciences, Ondo State, Nigeria
[3]Department of Agricultural Economics, Adekunle Ajasin University, Ondo State, Nigeria
[4]Department of Chemistry, Faculty of Science, Olabisi Onabanjo University, Ago-Iwoye, Ogun State, Nigeria
[5]Faculty of Pharmacy, University of Ibadan, Ibadan, Nigeria

*Corresponding Author: Olusegun Ayo Ade-adekunle, Email: adeshegs46@gmail.com

Received: August 7, 2024, **Revised:** November 12, 2024, **Accepted:** November 18, 2024, **ePublished:** December 31, 2024

Dear Editor,

Cholera is an infectious disease caused by ingesting food or water contaminated with the *Vibrio cholerae* bacteria. Its symptoms include severe diarrhea, dehydration, muscle cramps, weakness, fever, vomiting, low blood pressure, and intense thirst.[1] In extreme cases, cholera can be fatal within hours due to severe dehydration and intense thirst.[2] Sub-Saharan African nations, including Nigeria, are disproportionately affected by cholera, with global estimates ranging from 2.9 million to 95000 cases and deaths annually, particularly since the onset of the seventh pandemic in 1961.[3] This public health issue has persisted in Nigeria for decades, with current interventions proving largely ineffective.

Cholera poses significant public health challenges in Nigeria, highlighting the vulnerabilities within the country's healthcare system, as evidenced by recurrent outbreaks.[4] Since the launch of the Global Roadmap initiatives in 2017 by the Global Task Force on Cholera Control (GTFCC) and its partners, Nigeria has implemented several strategic measures. These measures include the development of a national strategic action plan and implementing oral cholera immunization programs, particularly in the northern regions.[5] The 2018 cholera outbreak highlighted the need for additional public health interventions to address the persistent transmission of cholera in Nigeria, alongside existing water, sanitation, and hygiene (WASH) initiatives and oral cholera immunization efforts. A comprehensive review identified that social, biological, environmental, and climatic factors are the primary drivers of cholera transmission in Nigeria.[6] These factors, alongside health system weaknesses and the interplay of multiple variables, contribute to the persistence of the disease. Social drivers of cholera transmission operate at both micro and macro levels, influencing households and communities in distinct ways. At the micro level, factors such as sanitation practices, water quality, and hygiene behaviors directly affect individual or household susceptibility to cholera. Indirectly, these factors can exacerbate transmission pathways; for example, inadequate household sanitation can facilitate the spread of *V. cholerae* through shared water sources. Conversely, at the macro-level, broader social drivers, such as widespread water contamination and natural disasters like floods, indirectly contribute to cholera transmission by creating favorable conditions for bacterial proliferation or by disrupting essential infrastructure. These environmental factors not only increase exposure risks but also promote the persistence of *V. cholerae* through interactions with biological factors, including genetic adaptations that may enhance its virulence and resistance. In addition to social drivers, which are commonly associated with recurring cholera transmission, mixed drivers, comprising both social and environmental factors, have also been identified in certain cases.[6]

The primary facilitators and barriers to implementing cholera control interventions can be categorized into four themes: political will, health system resources and infrastructure, community trust and cultural factors, and the spillover effects of the COVID-19 pandemic.[7] Between January 1 and June 11, 2024, Nigeria reported 1141 suspected cholera cases and 65 confirmed cases across 96 Local Government Areas (LGAs) in 30 states, resulting in 30 fatalities.[2] Ten states, Bayelsa, Zamfara, Abia, Cross River, Bauchi, Delta, Katsina, Imo, Nasarawa, and Lagos, accounted for 90% of the reported cholera cases. The outbreak can be attributed to several factors,

including inadequate sanitation and hygiene, limited access to clean water, poor sanitation infrastructure, improper handwashing practices, contamination of open foods (foods that are exposed and insufficiently protected, making them vulnerable to environmental contaminants such as bacteria), consumption of untreated water, indiscriminate waste disposal, and irregular sewage disposal, which involves the improper release of sewage into unsuitable locations such as open water sources. Additionally, the consumption of unregistered local beverages and inadequate access to standard precautions by healthcare workers treating cholera patients are other factors contributing to cholera transmission.[1,2] Reports indicate that the surge in cholera cases in certain affected areas can be attributed to the consumption of unregistered local beverages such as tiger nut milk, which is commonly consumed in major urban centers.[8] This issue is categorized as a social driver of transmission, as it is influenced by societal practices, habits, and infrastructure limitations, all of which can facilitate the spread of infectious diseases. Furthermore, Nigeria employs three oral cholera vaccines pre-qualified by the World Health Organization (WHO): Euvichol-Plus, Shanchol, and Dukoral. However, the limited supply of these vaccines has hindered efforts to control outbreaks in endemic regions, including Nigeria, due to the increased global demand for cholera vaccines.[9] This situation underscores a significant health equity gap between middle-income and low-income countries in their ability to effectively protect vulnerable populations from vaccine-preventable diseases such as cholera.

To mitigate cholera outbreaks in Nigeria, public health interventions must be designed and implemented using an integrated strategy to effectively prevent and control the disease.[3] To address further cholera outbreaks in Nigeria, both immediate intervention and long-term prevention strategies are essential. The recommended immediate response strategies involve enhancing surveillance and reporting mechanisms such as implementing more effective reporting systems and increasing monitoring in high-risk areas to quickly identify and respond to new cases. Additionally, improving access to clean drinking water via the WASH interventions, along with emergency water distribution, is necessary to ensure communities have access to safe drinking water. Medical treatment and rapid response are critical, which can be achieved by establishing cholera treatment centers equipped with the necessary supplies and staffed by trained personnel to provide immediate care for affected individuals. Public awareness and education campaigns should also be conducted to inform the public about cholera symptoms, prevention methods, and transmission routes, empowering communities to take proactive measures. Furthermore, partnerships with international health organizations are vital for securing vaccine supplies and logistical support for high-risk regions to bolster vaccination efforts.

However, long-term prevention strategies should include enforcing stringent standards by establishing and enforcing rigorous standards for the registration and quality control of all beverages sold within the country. This involves creating clear guidelines for manufacturing, labeling, and distribution to ensure that products are safe for consumption. Additionally, promoting public-private investment in sustainable water supply systems is crucial, which can be achieved through fostering structured partnerships between the government and private sector to promote investment in sustainable water supply systems. This can include offering incentives such as tax breaks or subsidies to private companies that build and maintain water infrastructure in underserved areas. Such initiatives can significantly enhance access to clean water, thereby reducing the risk of cholera outbreaks. Long-term prevention strategies may also involve establishing long-term contracts for safe drinking water to ensure continuous access to safe water and incorporating performance-based incentives to encourage accountability and sustainability among service providers. Moreover, enhancing healthcare capacity is crucial, which can be achieved by improving the capacity of healthcare facilities to efficiently diagnose and treat cholera. This includes training healthcare workers, ensuring the availability of necessary medical supplies, and establishing protocols for rapid response to cholera cases, as well as community engagement and empowerment by actively involving community members in the design and implementation of WASH programs. Such community empowerment ensures that interventions are culturally appropriate and more likely to be accepted and sustained. Furthermore, advocating for supportive policies is necessary to promote policies that facilitate the development of WASH infrastructure and public health initiatives, which can help secure funding and political commitment to improve health outcomes. Additionally, the implementation of robust monitoring and evaluation systems is vital for assessing the effectiveness of cholera control measures, allowing for the adaptation of strategies as needed, and ensuring that interventions remain relevant and effective in addressing the evolving challenges of cholera prevention.

Conclusion

Cholera remains a significant public health challenge in Nigeria, primarily transmitted through the consumption of food or water contaminated with *V. cholerae*. The disease is characterized by severe clinical manifestations and, in extreme cases, can lead to high mortality rates. Despite the implementation of various interventions, including oral cholera vaccination and initiatives focused on improving WASH, recurrent outbreaks persist, underscoring systemic vulnerabilities within the health infrastructure. The factors contributing to the spread of cholera in Nigeria are multifaceted, encompassing social, biological, environmental, and health system-related determinants. Immediate measures should prioritize enhanced surveillance, improved sanitation practices, and rapid medical responses. Furthermore, long-term

strategies must focus on establishing rigorous quality control measures for beverages, developing sustainable water supply systems, and strengthening healthcare infrastructure. A multi-sectoral approach, characterized by robust political commitment and active community engagement, is essential for effectively addressing the ongoing cholera crisis and promoting health equity among all populations in Nigeria.

Authors' Contribution

Conceptualization: Olusegun Ayo Ade-adekunle, Odunayo Olamide Ade-adekunle, Seyi Ayomide Olaoba, David Ayodeji Oso, Damilola Peace Abiona.
Data curation: Olusegun Ayo Ade-adekunle, David Ayodeji Oso.
Formal analysis: All authors.
Investigation: All authors.
Methodology: All authors.
Project administration: All authors.
Resources: All authors.
Software: All authors.
Supervision: Olusegun Ayo Ade-adekunle.
Validation: Olusegun Ayo Ade-adekunle, Feranmi Olalekan Adekunle, Femi Johnson Adebayo, David Gbenga Babalola.
Visualization: Olusegun Ayo Ade-adekunle, Hammed Abimbola Lawal, Miriam Ololade Umeh, Aishat Oluwatomiwa Mohammed.
Writing original draft: All authors.
Writing–review & editing: All authors.

Competing Interests

The authors declare no conflict of interests.

Ethical Approval

Not applicable.

Funding

None .

References

1. Smith SI. Nigeria's Cholera Outbreaks: Why They Happen and Are So Hard to Control. The Conversation; 2024. Available from: http://theconversation.com/nigerias-cholera-outbreaks-why-they-happen-and-are-so-hard-to-control-233123.
2. Nigeria Centre for Disease Control and Prevention. Stop Cholera: Public Health Advisory. Available from: https://ncdc.gov.ng/news/513/stop-cholera%3A-public-health-advisory.
3. Elimian KO, Musah A, Mezue S, Oyebanji O, Yennan S, Jinadu A, et al. Descriptive epidemiology of cholera outbreak in Nigeria, January-November, 2018: implications for the global roadmap strategy. BMC Public Health. 2019;19(1):1264. doi: 10.1186/s12889-019-7559-6.
4. Sow AU, Haruna UA, Amos OA, Olajide EO, Amene T, Odususi OD, et al. Tackling cholera outbreak amidst COVID-19 pandemic in Nigeria: challenges and recommendations. Public Health Rev. 2022;43:1604776. doi: 10.3389/phrs.2022.1604776.
5. Nigeria Centre for Disease Control and Prevention. Available from: https://ncdc.gov.ng/.
6. Elimian KO, Mezue S, Musah A, Oyebanji O, Fall IS, Yennan S, et al. What are the drivers of recurrent cholera transmission in Nigeria? Evidence from a scoping review. BMC Public Health. 2020;20(1):432. doi: 10.1186/s12889-020-08521-y.
7. Elimian K, Diaconu K, Ansah J, King C, Dewa O, Yennan S, et al. Enablers and barriers to implementing cholera interventions in Nigeria: a community-based system dynamics approach. Health Policy Plan. 2024;39(9):970-84. doi: 10.1093/heapol/czae067.
8. Are J. Investigation into Cause of Lagos Cholera Outbreak Not Concluded, Says Health Ministry. TheCable; 2024. Available from: https://www.thecable.ng/investigation-into-cause-of-lagos-cholera-outbreak-not-concluded-says-health-ministry/.
9. Ogundipe S, Akoni O. Cholera: FG Shopping for Emergency Vaccine. Vanguard News; 2024. Available from: https://www.vanguardngr.com/2024/06/cholera-fg-shopping-for-emergency-vaccine/.