

Enhancing Lassa fever health literacy through AI: Development and evaluation of a retrieval-augmented generation chatbot for public health education

Nsangou Paul Eric^{1,*}

¹Medicine Department, Université des Montagnes, Bangangte, Cameroon

&Corresponding author: Nsangou Paul Eric, Medicine Department, Université des Montagnes, Bangangte, Cameroon. **Email:** nsangoupauleric5@gmail.com

Citation: Nsangou Paul Eric et al., Enhancing Lassa fever health literacy through AI: Development and evaluation of a retrieval-augmented generation chatbot for public health education. *Journal of Interventional Epidemiology and Public Health*. 2025;8(ConfProc5):00265.

DOI: <https://doi.org/10.37432/jieph-confpro5-00265>

LINK: <https://afenet-journal.org/enhancing-lassa-fever-health-literacy-through-ai-development-and-evaluation-of-a-retrieval-augmented-generation-chatbot-for-public-health-education/>

Received: 10/05/2025 **Accepted:** 09/07/2025 **Published:** 06/08/2025

Keywords: Lassa fever, chatbot, Retrieval-Augmented Generation Chatbot, public health, artificial intelligence

This is part of the proceedings of the ECOWAS 2nd Lassa fever International Conference in Abidjan, September 8 – 11, 2025

© Nsangou Paul Eric et al. *Journal of Interventional Epidemiology and Public Health*. This is an Open Access article distributed under the terms of the Creative Commons Attribution International 4.0 License (<https://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Introduction

Lassa fever is an acute viral hemorrhagic illness endemic to West Africa, with an estimated 100,000 to 300,000 infections annually and approximately 5,000 deaths. Despite its public health significance, widespread misinformation, limited health literacy, and poor access to reliable educational resources hinder effective prevention and control. In this context, artificial intelligence (AI)-powered chatbots offer a novel approach to disseminating accurate, accessible, and source-attributed health information. This study aimed to develop and evaluate a custom retrieval-augmented generation (RAG)-based AI chatbot designed to improve health literacy on Lassa fever.

Methods

This was a two-phase evaluation study conducted in a virtual setting. A RAG-based chatbot was developed using curated and trusted Lassa fever guidelines from the World Health Organization (WHO), Nigeria Centre for Disease Control (NCDC), and peer-reviewed literature. The evaluation involved: Expert Assessment: Forty-four predefined questions were submitted to the chatbot. Infectious disease specialists rated responses for appropriateness (appropriate/partly appropriate/inappropriate) and source attribution (matched/partly matched/unmatched/general

knowledge). Simulated Consultations: sixteen patient-like queries were tested to assess real-world applicability and response quality.

Results

In the expert assessment, 73% (32/44) of responses cited reference documents, of which 94% (30/32) were rated fully appropriate. Among general knowledge responses (27%, 12/44), only one (8%) was deemed inappropriate. In the simulated consultations, 100% (16/16) of responses were rated fully appropriate and correctly sourced.

Conclusion

The custom AI chatbot demonstrated high accuracy and contextual relevance in delivering Lassa fever information, with strong performance in both expert and simulated evaluations. These findings support its utility as a scalable tool for public health education. Broader implementation and expansion of reference sources are recommended to further reduce reliance on general knowledge and enhance disease-specific literacy.