8TH WORLD CONGRESS ON PUBLIC HEALTH AND GLOBAL WELLNESS

November 14-15, 2025 | London, UK

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Etiology of diarrheal hospitalizations following rotavirus vaccine implementation and association of enteric pathogens with malnutrition among under-five children in India

Malnourished children are at higher risk of mortality and morbidity following diarrheal illness and certain enteropathogens have been associated with malnutrition in children. Very few studies have comprehensively looked at the etiology of diarrhea in malnourished children and most have used conventional diagnostic methods with suboptimal sensitivity. We used a highly sensitive molecular approach against a broad range of pathogens causing diarrhea and examined their association with malnutrition. In addition, we looked at the pathogen diversity of pediatric diarrhea, three years after the nationwide rotavirus vaccine introduction to understand the evolving landscape of pathogens, which is crucial for planning strategies to further reduce the diarrhea burden. Clinical details and diarrheal stool samples were collected from hospitalized children aged < 5 years from three sentinel sites in India for a period of one year. The samples were tested by qPCR for 16 established causes of diarrhea using TaqMan Array Cards. A total of 772 children were enrolled, from whom 482 (62.4%) stool specimens were tested. No specific pathogen was associated with diarrhea among children with acute or chronic malnutrition compared to those with better nutritional status. Overall, adenovirus was the leading pathogen (attributable fraction (AF) 16.9%; 95% CI 14.1 to 19.2) followed by rotavirus (AF 12.6%; 95% CI 11.8 to 13.1) and Shigella (AF 10.9%; 95% CI 8.4 to 16.4). The majority of diarrhea requiring hospitalization in children aged < 2 years could be attributed to viruses, while Shigella was the most common pathogen among children aged > 2 years. These data on the prevalence and epidemiology of enteropathogens identified potential pathogens for public health interventions.

Keywords
Children; Diarrhea; Enteropathogens; Low resource settings; Malnutrition; Molecular testing; qPCR.

ISBN: 978-1-917892-32-2

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Marburg virus disease outbreak in Rwanda, 2024: Current efforts and calls to action to mitigate the outbreak in Rwanda

The recent outbreak of Marburg virus disease (MVD) in Rwanda, first reported in September 2024, marks the country's initial encounter with this highly lethal hemorrhagic fever caused by the Marburg virus. With primary transmission from fruit bats and subsequent human-to-human spread through direct contact, MVD presents significant public health challenges due to its rapid progression from flu-like symptoms to severe hemorrhagic fever and high mortality rates. Rwanda's Ministry of Health responded swiftly, implementing critical containment measures, such as intensive contact tracing, targeted vaccination for suspected cases and healthcare providers, restricting caregiver access, limiting traditional gatherings, and enforcing strict hygiene and infection control protocols. In the last three and a half years, Rwanda has been dealing with COVID-19, Mpox (formerly monkeypox), and now the Marburg outbreak. Drawing on lessons from past public health crises, Rwanda's Ministry of Health is implementing swift action to manage the situation. Here we discussed Rwanda's strategies in managing the MVD outbreak, emphasizing the importance of a One Health approach that integrates human, animal, and environmental health to mitigate zoonotic threats. Vaccination efforts targeting healthcare providers and high-risk contacts have become a vital component of Rwanda's response, aiming to protect those on the front lines and prevent further spread. The response is further strengthened by partnerships with global health organizations, including the World Health Organization (WHO), underscoring the need for coordinated international support and cross-border containment measures. This MVD outbreak highlights the urgency of ongoing research into effective treatments and licensed vaccines to bolster Rwanda's preparedness and resilience against future outbreaks.

Keywords
Marburg Virus Disease (MVD), Vaccination, Rwanda, public health, outbreaks

Biography
Louange Bienvenu BYIRINGIRO is a Rwandan pharmacist with professional experience in pharmaceutical regulation, medical product assessment, and community health promotion. He currently serves as a Marketing Authorization Assessor at Rwanda FDA, where he contributed to a significant rise in the National Register of human medicines and supported WHO maturity level 3 certification. Louange holds a Bachelor of Pharmacy from the University of Rwanda and is pursuing advanced studies in Biomedical Expertise. Passionate about medicine safety and public health, he has published multiple research papers and actively participates in outreach programs through Healthcare Professionals in Global Transformation.

ISBN: 978-1-917892-32-2