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Expert Opinion

Marburg Virus: A Looming Threat Nigeria Cannot Ignore

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Abstract

To the Editor,

Marburg virus, a filovirus closely related to Ebola, causes a severe haemorrhagic illness with case fatality rates ranging from 24 % to 88 %, depending on the timeliness and strength of the outbreak response [1]. Transmission occurs through contact with infected body fluids or contaminated materials, and via exposure to infected fruit bats (*Rousettus aegyptiacus*), which have been recorded in several Nigerian ecological zones [1,2]. Deforestation, wildlife trade, and settlement encroachment further elevate spill-over risk.

Nigeria's experiences with Lassa fever reveal enduring structural weaknesses: notably, delayed detection, limited laboratory coverage, and under-reporting, which would equally challenge any Marburg virus disease (MVD) response [3]. Analyses of recent Marburg outbreaks in Ghana and Rwanda highlight diagnostic delays, infection prevention and control (IPC) breaches, and overstretched laboratory capacity as critical gaps [4,5].

The rising frequency of viral haemorrhagic fever (VHF) outbreaks across sub-Saharan Africa necessitates immediate and strategic action from Nigerian public health authorities. In the past five years, MVD outbreaks have been confirmed in Guinea, Ghana, Tanzania, and Rwanda, reflecting expanding regional vulnerability [1,6]. Although Nigeria has not yet reported any confirmed MVD cases, its porous borders, high population density, and concurrent Lassa fever and Mpox burdens make preparedness a national imperative [7]. The recent cross-sectional assessment by Oisakede et al. [8] offers empirical confirmation of this vulnerability. The study, conducted among 216 healthcare workers at Nigeria's national viral haemorrhagic fever reference centre (Irrua Specialist Teaching Hospital), revealed that only 19 % of doctors and 10 % of nurses had received formal MVD training, and less than half felt adequately protected by personal protective equipment (PPE). Confidence in hospital readiness was significantly lower among doctors (32.5 %) than nurses (65.6 %), indicating institutional and role-specific disparities in outbreak preparedness.

These empirical findings from Oisakede et al. [8] and the regional evidence base reveal a clear preparedness gap. While Nigeria benefits from a national Lassa fever infrastructure, this platform is yet to be fully extended to filoviruses like Marburg. The 2026 data provide a measurable baseline for monitoring progress and justify targeted capacity-building funding within the National Action Plan for Health Security (2026–

2030). Preparedness is thus not merely theoretical; it demands investment in people, protocols and platforms. Leveraging the Oisakede et al. [8] evidence for policy advocacy strengthens the argument that Nigeria must institutionalise training, simulation, and infrastructure before the next filovirus crisis arrives.

Proposed Model for Reducing MVD and other VHF Transmission

Currently, no licensed vaccine exists for the Marburg virus or other VHFs, although several candidates are in preclinical or early-phase trials. However, vaccine development may take several years before wide deployment. To mitigate transmission and reduce disease impact, we propose a four-tiered model that can function even in the absence of a vaccine, focusing on environmental, ecological, and health system interventions.

This Oisakede's Inverted Triangular Model (Fig. 1) outlines a sequential, evidence-based approach:

i. Safe Built Environment: Promote environmental hygiene and structural designs that minimise human contact with vectors or reservoirs (e.g., fruit bats).
ii. Eliminate or Drive Out the Culprit: Target vector control and wildlife surveillance to limit zoonotic spillover.
iii. Provide Timely Treatment: Ensure rapid diagnosis, case management, and IPC compliance to prevent nosocomial transmission.
iv. Vaccination (When Available): Once safe and effective vaccines become available, immunisation programmes should prioritise high-risk communities.

The model is initially inverted, representing the current phase where prevention and surveillance dominate due to a lack of vaccines. Once vaccines are available, the triangle can be flipped upright, symbolising a shift toward immunity-based protection for high-risk populations under *Oisakede's Triangular Model*.

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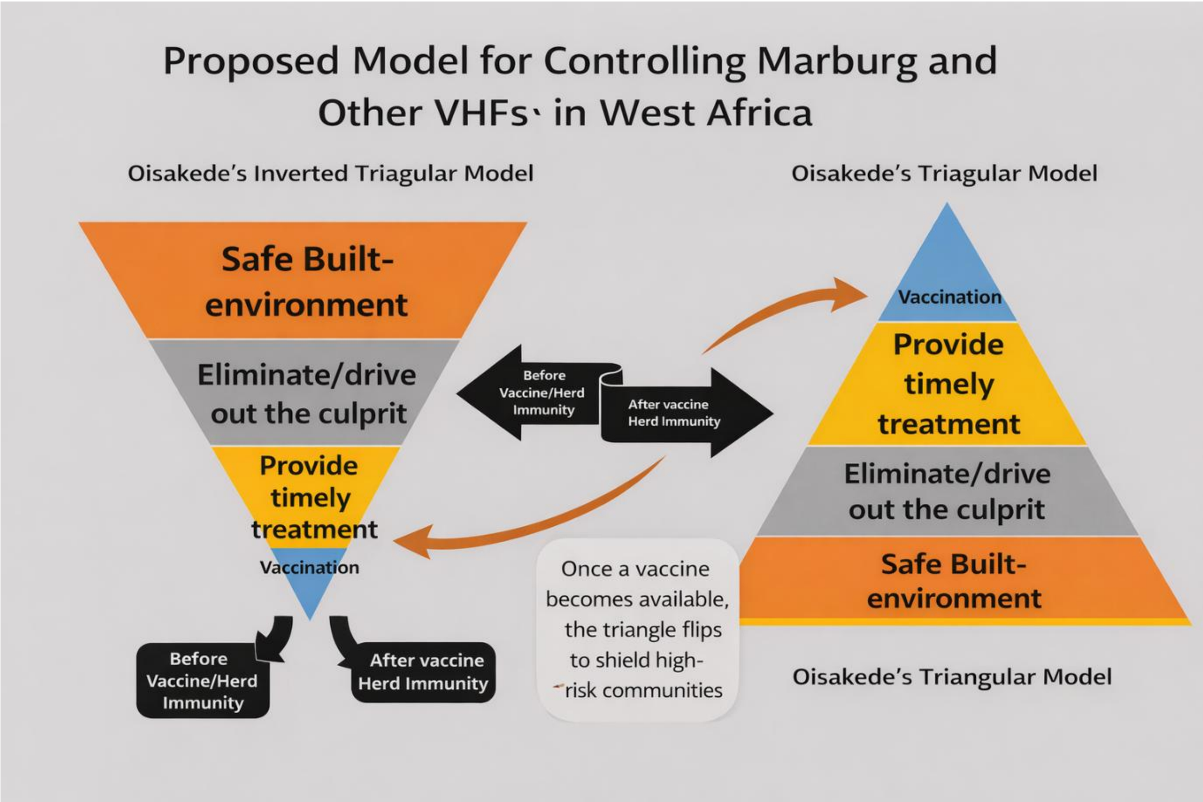

Fig. 1 Proposed Model for the Control of MVD and Other Viral Haemorrhagic Fevers in West Africa. The model demonstrates two adaptive approaches: an inverted triangular model (pre-vaccine stage) prioritising environmental safety, vector control, and timely treatment; and a triangular model (post-vaccine stage) where vaccination becomes the apex intervention. The transition reflects progression from environmental and behavioural interventions to biomedical protection once herd immunity becomes achievable.

Evidence-Based Actions for Nigeria

1. *Strengthen Surveillance and Laboratory Capacity*

   Expand Nigeria's existing VHF surveillance framework to include Marburg virus. Equip the National Reference Laboratory (NRL) and designated zonal laboratories for filovirus PCR testing, ensuring biosafety level-3 (BSL-3) compliance. Institutional training should prioritise biosafety level-3 competencies and establish specimen-referral networks consistent with WHO and Africa CDC protocols [9].

2. *Enhance Cross-Border Collaboration*

   Formalize cross-border early warning systems through ECOWAS and Africa CDC platforms to facilitate data sharing, coordinated alerting, and joint simulation exercises [6].

3. *Integrate Risk Communication and Community Engagement*

   Develop culturally sensitive risk communication and community engagement (RCCE) plans involving community leaders, religious institutions, and traditional healers. These groups play a vital role in early outbreak alerts and rumor management [4].

4. *Strengthen Health Workforce Readiness*

   Implement a rapid training curriculum for frontline clinicians on VHF recognition, sample management, and IPC. Pre-position PPE (e.g., N95 respirators, impermeable gowns, and face shields) in high-risk treatment centres.

5. *Adopt a One-Health Approach to Preparedness*

   Integrate human, animal, and environmental surveillance by linking the Nigeria Centre for Disease Control and Prevention (NCDC), Federal Ministry of Agriculture and Rural Development, and wildlife agencies. Coordinated wildlife surveillance of *Rousettus aegyptiacus* colonies can improve early detection of spill-over events [9].

Conclusion

Although Nigeria has not reported Marburg virus cases, the recurrence of outbreaks in neighbouring countries underscores the urgent need for readiness. The Federal Ministry of Health (FMoH), NCDC, and partners such as WHO, Africa CDC, and ECOWAS should: designate a national reference laboratory for filovirus diagnostics, establish regional referral pathways, implement frontline VHF training, and strengthen community engagement and wildlife surveillance under a One-Health framework. Furthermore, integrating the Oisakede's Model within Nigeria's National Action Plan for Health Security could strengthen community resilience through environmental control, vector management, clinical readiness, and eventual vaccination rollout.

Acting now with clear, measurable steps will safeguard lives and maintain public confidence in Nigeria's epidemic preparedness.

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