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Case Report

A Case of Household Transmission of Lassa Fever Between Spouses in Katsina State Nigeria: Epidemiological Investigation and Public Health Response

Yahaya Shamsuddeen Suleiman[1,2*], Lawal Aminu[1], Suleiman Kabir[1], Lawal Nasiru[2], Ruma Mukhtar[1], Yahaya Jamilu Runka[3], Muhammad Sani Abubakar[5], Shehu Bello[4], Haladu Suleiman Ahmed[6], Garba Idris[1], Hussaina Abdulaziz[1], Nafiu Abubakar[1], Muftahu Bawa[1], Dalhatu Abubakar[3]

[1]Katsina State Primary Health Care Agency, Nigeria.
[2]Department of Community Medicine Umar Musa Yar'adua University Katsina.
[3]World Health Organization (WHO), Katsina.
[4]State Hospital Services Management Board, Katsina, Nigeria.
[5]Federal Teaching Hospital Katsina, Nigeria.
[6]AFENET, Nigeria.

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***Corresponding author:** Yahaya Shamsuddeen Suleiman, Katsina State Primary Health Care Agency, Nigeria.

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Abstract

Lassa fever is an acute viral hemorrhagic illness endemic in West Africa and is associated with significant morbidity and mortality (World Health Organization [WHO], 2024). Although primarily a zoonotic disease, person-to-person transmission can occur, particularly among close contacts and within healthcare settings where infection prevention and control measures are inadequate (WHO, 2024). First identified in 1969 in the town of Lassa, Borno State, Nigeria, the disease is caused by the Lassa virus, a member of the Arenaviridae family (WHO, 2024). The primary mode of transmission to humans is through exposure to food, household items, or surfaces contaminated with the urine or feces of infected multimammate rats (*Mastomys natalensis*), which serve as the natural reservoir of the virus (WHO, 2024; WHO, 2025). Human-to-human transmission may also occur through direct contact with the blood, urine, feces, or other bodily secretions of infected individuals, especially in healthcare environments lacking adequate infection prevention and control practices (WHO, 2024).

Case Presentation

This paper reports a confirmed case of Lassa fever in a 55-year-old male farmer from Dandume Local Government Area (LGA), Katsina State, Nigeria. The patient developed a febrile illness on 19 February 2026 and was initially treated for malaria without clinical improvement. He subsequently sought care at multiple health facilities before Lassa fever was suspected at a tertiary healthcare facility. Despite medical intervention, the patient died on 11 March 2026. Laboratory confirmation of Lassa virus infection was established through reverse transcription polymerase chain reaction (RT-PCR) testing on 15 March 2026.

Public Health Response

A total of fifteen contacts were identified, line-listed, and monitored daily for a period of 21 days. Among these, one high-risk contact, the patient's spouse, subsequently developed symptoms consistent with Lassa fever and tested positive by reverse transcription polymerase chain reaction (RT-PCR), confirming secondary household transmission. The patient was promptly commenced on ribavirin therapy and achieved full clinical recovery. Public health response measures included active contact tracing, enhanced surveillance, strengthening of infection prevention and control (IPC) practices within healthcare facilities, and community-based risk communication and sensitization activities.

Conclusion
This case underscores the public health consequences of delayed diagnosis and highlights the potential for household transmission of Lassa fever among close contacts. The occurrence of secondary infection in a household contact emphasizes the need for heightened clinical suspicion, timely laboratory confirmation, prompt patient isolation, and strict adherence to infection prevention and control (IPC) measures within both healthcare and community settings. Strengthening surveillance systems, contact tracing, and community awareness remains critical in preventing further transmission and reducing Lassa fever–related morbidity and mortality.

Keywords: *Lassa fever; Household transmission; Secondary infection; Contact tracing; Infection prevention and control; Nigeria*

Introduction

Lassa fever is an acute zoonotic viral hemorrhagic disease caused by the Lassa virus, a member of the *Arenaviridae* family, first identified in Lassa town, Borno State, Nigeria, in 1969 (World Health Organization [WHO], 2024). The disease is endemic in several West African countries, including Nigeria, Sierra Leone, Liberia, Guinea, and Benin, where it remains a significant public health concern due to its recurrent outbreaks and associated morbidity and mortality (WHO, 2024; WHO, 2025).

The natural reservoir of Lassa virus is the multimammate rat (*Mastomys natalensis*), which commonly inhabits human dwellings and surrounding environments. Human infection primarily occurs through exposure to food, household items, or surfaces contaminated with the urine or feces of infected rodents (WHO, 2024). Rodent-to-human transmission remains the predominant route of infection in endemic communities, particularly in settings with poor environmental sanitation and food storage practices (WHO, 2025).

In addition to zoonotic transmission, human-to-human transmission has been well documented, particularly among household contacts and healthcare workers exposed to infected blood, urine, feces, vomitus, or other body fluids in the absence of adequate infection prevention and control (IPC) measures (WHO, 2024). Secondary transmission within households and healthcare facilities has contributed to several outbreaks reported across endemic regions, highlighting the importance of early case detection, patient isolation, and strict adherence to IPC protocols (WHO, 2024).

The incubation period of Lassa fever ranges from 2 to 21 days, and clinical manifestations vary considerably, ranging from asymptomatic infection and mild febrile illness to severe multisystem disease characterized by hemorrhage, shock, neurological complications, and organ failure (WHO, 2025). Although approximately 80% of infections are mild or asymptomatic, severe disease occurs in about 20% of infected individuals. The overall case fatality rate is estimated at approximately 1%; however, mortality among hospitalized patients with severe disease may exceed 15–20% (WHO, 2024; WHO, 2025).

In Nigeria, Lassa fever is a priority epidemic-prone disease under the Integrated Disease Surveillance and Response (IDSR) strategy, and a single laboratory-confirmed case is considered sufficient to trigger outbreak investigation and immediate public health response measures. These measures include case management, contact tracing, enhanced surveillance, risk communication, community engagement, and strengthening of infection prevention and control systems to prevent further transmission.

This report describes a confirmed fatal case of Lassa fever in a 55-year-old male farmer from Dandume Local Government Area (LGA), Katsina State, Nigeria, and the subsequent secondary transmission to a household contact, highlighting the epidemiological investigation and public health response implemented to contain the outbreak.

Case Presentation

Patient Information

The index case was a 55-year-old male farmer from Dandume Local Government Area (LGA), Katsina State, Nigeria, with no documented travel history or known prior contact with a confirmed case of Lassa fever before the onset of illness.

Clinical Findings and Timeline

The patient developed symptoms on 19 February 2026, presenting initially with fever, headache, generalized body weakness, malaise, abdominal pain, and chest pain. On 4 March 2026, he presented to the Comprehensive Health Centre (CHC) Dandume, where he was managed for severe malaria without clinical improvement.

Due to persistent and worsening symptoms, the patient was referred to General Hospital Funtua on 6 March 2026 for further evaluation and management. His clinical condition subsequently deteriorated, with the development of hematemesis and progressive weakness, necessitating referral to Ahmadu Bello University Teaching Hospital (ABUTH), Zaria, on 10 March 2026. Despite medical intervention and supportive management, the patient died on 11 March 2026. Postmortem laboratory investigation later confirmed Lassa virus infection by reverse transcription polymerase chain reaction (RT-PCR) on 15 March 2026.

Diagnostic Assessment

Lassa fever was clinically suspected at Ahmadu Bello University Teaching Hospital (ABUTH), Zaria, following the patient's poor response to antimalarial and antibiotic therapy, in addition to the presence of hemorrhagic manifestations, including hematemesis. Blood samples were subsequently collected and sent to the National Reference Laboratory, where Lassa virus infection was confirmed by reverse transcription polymerase chain reaction (RT-PCR).

Outcome

The patient died before laboratory confirmation of Lassa fever was obtained, underscoring the challenges associated with delayed clinical suspicion, late referral, and delayed diagnosis of viral hemorrhagic fevers in endemic settings.

Public Health Response

Following laboratory confirmation of the index case, the Katsina State Ministry of Health activated the Rapid Response Team (RRT) to coordinate outbreak investigation and response activities.

Case Investigation

Environmental assessment of the patient's residence revealed evidence of rodent infestation, poor household sanitation, and unsafe food storage and drying practices, all of which may have increased the risk of rodent-to-human transmission.

Contact Tracing

A total of fifteen contacts were identified and line-listed,

comprising nine household contacts, two community contacts, and four healthcare workers. All identified contacts were monitored daily for 21 days for the development of symptoms consistent with Lassa fever.

Secondary Case (Household Transmission)

The patient's spouse, classified as a high-risk household contact, developed symptoms suggestive of Lassa fever on 13 March 2026. Laboratory testing subsequently confirmed Lassa virus infection by RT-PCR on 28 March 2026. She was promptly commenced on intravenous ribavirin therapy and achieved full clinical recovery.

Infection Prevention and Control (IPC) Assessment

Assessment of healthcare facilities involved in the management of the index case identified gaps in infection prevention and control practices, including low clinical suspicion for Lassa fever at initial presentation, inadequate triage systems, and insufficient availability and use of personal protective equipment (PPE) at General Hospital Funtua. In response, healthcare workers received refresher training on Lassa fever case recognition and IPC measures, while additional IPC supplies and PPE were distributed to affected facilities.

Risk Communication and Community Engagement

Community sensitization activities were conducted to improve public awareness regarding the signs and symptoms of Lassa fever, modes of transmission, and preventive measures. Hausa-language radio jingles and community engagement sessions were utilized to disseminate key public health messages across affected communities.

Post-Exposure Prophylaxis

High-risk contacts identified during the outbreak investigation received oral ribavirin as post-exposure prophylaxis in accordance with national response guidelines.

Environmental Control Measures

Community-led environmental sanitation and rodent control interventions were implemented with support from health and veterinary authorities to reduce rodent infestation and minimize the risk of further transmission.

Outbreak Outcome

The outbreak was officially declared over on 16 April 2026 following 42 consecutive days without identification of any new confirmed cases.

Discussion

This case highlights the persistent challenges associated with the early diagnosis and management of Lassa fever in endemic settings such as Nigeria, where the nonspecific clinical presentation frequently overlaps with other common febrile illnesses, particularly malaria and typhoid fever (World Health Organization [WHO], 2024). Early symptoms of Lassa fever, including fever, headache, malaise, generalized weakness, abdominal pain, and chest pain, are often indistinguishable from other endemic infectious diseases, contributing to delayed clinical suspicion and late initiation of appropriate management (WHO, 2025). In the present case, the patient was initially managed for severe malaria at a peripheral health facility, resulting in delayed diagnosis, multiple referrals, and increased risk of disease transmission.

Delayed recognition of Lassa fever remains a major contributor to poor clinical outcomes and continued transmission within both healthcare and community settings in Nigeria (Nigeria Centre for Disease Control and Prevention [NCDC], 2024). The progression of the patient's illness to hemorrhagic manifestations before suspicion of Lassa fever reflects gaps in early detection and triage systems, particularly at lower levels of healthcare delivery. Similar findings have been documented in previous outbreaks in Nigeria, where delayed diagnosis and inadequate infection prevention and control (IPC) practices facilitated nosocomial and household transmission (Fichet-Calvet & Rogers, 2009; McCormick et al., 1987).

The occurrence of secondary transmission in the patient's spouse further demonstrates the potential for household spread of Lassa fever through close contact with infected bodily fluids and contaminated materials. Human-to-human transmission has been widely reported among family members and caregivers, especially in situations involving prolonged exposure without adequate protective measures (WHO, 2024). The spouse's eventual recovery following early diagnosis and prompt initiation of intravenous ribavirin therapy underscores the importance of timely case identification and treatment in improving clinical outcomes.

Environmental assessment conducted during the outbreak investigation revealed rodent infestation and unsafe food storage and drying practices within the household. These findings are consistent with established epidemiological evidence linking poor environmental sanitation and increased human-rodent interaction with the transmission of Lassa virus in endemic communities (Fichet-Calvet & Rogers, 2009). Community-based environmental control measures and public health education therefore remain essential components of Lassa fever prevention strategies.

The outbreak response also identified deficiencies in infection prevention and control preparedness within healthcare facilities, including low index of suspicion, inadequate triage systems, and insufficient availability and utilization of personal protective equipment (PPE). Similar healthcare system gaps have been reported during previous Lassa fever outbreaks in Nigeria and other West African countries, emphasizing the need for continuous healthcare worker training, strengthened surveillance systems, improved laboratory capacity, and sustained IPC interventions (NCDC, 2024; WHO, 2024).

Overall, this case reinforces the importance of maintaining a high index of suspicion for Lassa fever among patients presenting with persistent febrile illness unresponsive to standard antimalarial or antibiotic therapy in endemic regions. Early diagnosis, rapid laboratory confirmation, prompt isolation, effective contact tracing, and strict adherence to IPC measures are critical to preventing secondary transmission and reducing Lassa fever–related morbidity and mortality.

Limitations:

First, genomic sequencing of the Lassa virus was not performed; therefore, molecular confirmation of the transmission linkage between the index case and the secondary household case could not be established.

Second, delays in laboratory confirmation limited opportunities for early case management, timely initiation of targeted treatment, and prompt implementation of outbreak control measures. These delays may have contributed to prolonged exposure and increased risk of secondary transmission.

Recommendations

- Strengthen healthcare worker awareness and clinical suspicion of Lassa fever through continuous medical education, training, and dissemination of updated case management

guidelines, particularly in endemic areas.

- Improve access to decentralized and timely laboratory diagnostic services, including expansion of RT-PCR testing capacity and efficient sample transportation systems to facilitate early detection and prompt response.
- Institutionalize and strengthen infection prevention and control (IPC) practices across all levels of healthcare delivery through regular training, supportive supervision, adequate provision of personal protective equipment (PPE), and functional triage systems for early identification of suspected cases.
- Enhance community-based surveillance and early warning systems by engaging community informants, traditional leaders, and frontline healthcare workers in the prompt identification and reporting of suspected cases.
- Promote integrated One Health approaches involving the health, veterinary, environmental, and community sectors to strengthen rodent control, environmental sanitation, food safety practices, and public awareness on prevention of Lassa fever transmission.
- Strengthen risk communication and community engagement strategies through culturally appropriate health education campaigns aimed at improving public understanding of Lassa fever symptoms, transmission pathways, and preventive measures.

Conclusion

This case highlights the dual public health threat posed by both zoonotic and person-to-person transmission of Lassa fever in endemic settings. The occurrence of secondary household transmission following delayed diagnosis of the index case underscores the critical importance of maintaining a high index of clinical suspicion for Lassa fever among patients presenting with persistent febrile illness unresponsive to routine treatment. Early detection, rapid laboratory confirmation, prompt patient isolation, effective contact tracing, and strict adherence to infection prevention and control (IPC) measures are essential for interrupting transmission and reducing morbidity and mortality. Strengthened surveillance systems, community engagement, and coordinated multisectoral public health response remain vital for the prevention and control of future Lassa fever outbreaks in Nigeria.

Ethical Considerations

Investigation conducted as part of routine outbreak response; patient confidentiality maintained.

Funding

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Competing Interests

No competing interests declared.

Authors' Contributions

All authors contributed to the investigation, response, and manuscript; all approved the final version.

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