

Preparedness and Preventive Practices for Lassa Fever Transmission among Health Care Workers in Bauchi LGA, Bauchi State, Nigeria

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Annotation: Background: Lassa fever remains a significant public health threat in Nigeria, particularly among healthcare workers (HCWs) who face high occupational risks due to frequent exposure. Despite increasing government and institutional efforts to curb transmission, gaps in preparedness and preventive practices persist in endemic regions, raising concerns about healthcare system resilience.

Objective: This study assessed the level of knowledge, preventive practices, and preparedness for Lassa fever prevention among healthcare workers in Bauchi Local Government Area (LGA), Bauchi State, Nigeria.

Method of Analysis: A descriptive cross-sectional survey was conducted among 150 healthcare workers across

primary, secondary, and referral facilities. Data were collected using a structured questionnaire and presented using frequency and percentage distributions. Associations between knowledge, preventive practices, and preparedness levels were analyzed and interpreted in line with standard epidemiological reporting.

Results: The findings revealed that 61.3% of respondents demonstrated adequate knowledge of managing Lassa fever cases, and all agreed that laboratory staff and health workers are vulnerable to infection. Preventive practices showed that 65.3% acknowledged that prevention was linked to knowledge, and 61.3% reported regular use of personal protective equipment (PPE), although 59.3% noted inadequate supplies of safety materials. Preparedness assessment indicated that 66.7% of HCWs reported improvisation during shortages, 69.3% affirmed the availability of isolation spaces, and 79.3% agreed that adequate preventive measures were in place to reduce future transmission. Socio-demographic analysis showed that most HCWs were between 30–39 years (36.7%), predominantly nurses (33.3%), with the majority working in primary healthcare facilities (60%).

Conclusion: Although healthcare workers in Bauchi LGA demonstrated a relatively high level of knowledge and preparedness regarding Lassa fever, gaps persist in preventive practices, particularly in the consistent use and availability of safety materials. Strengthening supply chains, expanding infection prevention and control training, and improving facility-level

preparedness remain critical for mitigating occupational risks and preventing transmission among HCWs in Lassa fever-endemic regions.

Keywords: Lassa fever, Healthcare workers, Preparedness, Preventive practices, Bauchi State.

Introduction

Lassa fever remains one of the most persistent viral hemorrhagic fevers in West Africa and poses significant public health challenges in Nigeria. The first recognized outbreak in Bauchi State was reported in 2015, after which the disease spread to 19 states of the Federation, resulting in 101 deaths and 175 confirmed or suspected cases as of February 2016 (Nigeria Centre for Disease Control [NCDC], 2016). Bauchi, Edo, Oyo, and Taraba States have consistently recorded the highest incidence, accounting for more than half of confirmed cases and reported deaths (Usifor, Akintunde & Adetunji, 2018). Health workers remain particularly vulnerable; the World Health Organization (WHO, 2017) reported that two health workers had died and four were confirmed to have contracted Lassa fever during outbreaks.

The burden of Lassa fever has remained high over the years, with recurrent outbreaks leading to considerable morbidity and mortality. Between 1969 and 2013, an estimated 100,000 deaths were attributed to the disease (WHO, 2012). More recently, Dan-Nwafor, Ilori, and Ipadeola (2019) observed that Ebonyi, Edo, and Ondo States—where specialized treatment centers exist—accounted for 71% of confirmed cases in 2019. Transmission occurs through contact with infected rodents and their excreta, inhalation of contaminated dust, or direct human-to-human spread via blood and bodily fluids (McCormick & Fisher-Hoch, 2002; Ogbu, Ajuluchukwu & Uneke, 2007). Emerging evidence also suggests the possibility of sexual transmission, with viral nucleic acid detected in semen up to 103 days after infection onset (Fisher-Hoch et al., 2014). The persistence of health worker infections during outbreaks demonstrates the occupational risks of Lassa fever, highlighting the need to assess knowledge, preparedness, and preventive practices among health workers in endemic areas such as Bauchi State.

Literature Review

Surveillance and Epidemiology of Lassa Fever in Nigeria

Surveillance of Lassa fever in Nigeria is coordinated through the Integrated Disease Surveillance and Response (IDSR) platform, which facilitates the flow of information from health facilities to ward focal persons, Disease Surveillance and Notification Officers (DSNOs), State Epidemiologists, and ultimately the NCDC (WHO, 2023). Recent epidemiological data indicate an increasing trend of cases: in 2022, 1,067 confirmed cases were reported across 27 states and 112 Local Government Areas (LGAs) (NCDC, 2022), while in 2023, confirmed cases rose to 1,170 across 28 states and 114 LGAs (NCDC, 2023). Bauchi State alone accounted for nearly 18% of national cases in 2023 (NCDC, 2023). Infections among health workers remain recurrent; WHO (2023) reported that 42 cases of confirmed Lassa fever among health workers were recorded in 11 states during the 2023 outbreak.

Knowledge, Preparedness, and Preventive Practices among Health Workers

Studies have highlighted gaps in preparedness and infection prevention and control (IPC) among Nigerian health workers. Ajayi, Nwigwe, and Adebayo (2013) reported inadequate knowledge and

inconsistent use of protective equipment among health workers in Edo State. Similarly, Tobin, Asogun, and Akpede (2015) observed that delays in case recognition and lack of strict adherence to IPC measures contributed significantly to nosocomial transmission during outbreaks. A more recent study by Okonofua, Nwankwo, and Adeyemi (2021) emphasized that health workers' level of knowledge is closely associated with their preventive practices and compliance with surveillance protocols. In Bauchi State specifically, nosocomial transmission has been documented. Reports from the Bauchi State Specialist Hospital indicated that eight healthcare workers were infected during outbreaks in 2017 and 2019, largely due to inadequate IPC training and lack of personal protective equipment (Bauchi State Ministry of Health, 2020). Gaps in surveillance and reporting were also highlighted by Dan-Nwafor et al. (2020), who found that underreporting and weak diagnostic capacity delayed effective outbreak response.

Clinical Features, Management, and Preventive Measures

Clinically, Lassa fever presents with nonspecific symptoms such as fever, sore throat, and gastrointestinal disturbances, often complicating early diagnosis (Richmond & Baglolle, 2003). Severe cases progress to hemorrhage, convulsions, and multi-organ dysfunction. Laboratory confirmation relies on reverse transcriptase polymerase chain reaction (RT-PCR) (Shaffer et al., 2019). Ribavirin remains the mainstay of treatment, though it is most effective when administered within six days of symptom onset (Yun et al., 2015). There is currently no licensed vaccine for Lassa fever (Mateer, Huang & Shehu, 2018). The Federal Ministry of Health (FMoH) and NCDC have, in collaboration with partners, established treatment centers in endemic states, including Bauchi, to reduce case fatality (NCDC, 2023). Nonetheless, the persistent occurrence of outbreaks and high infection rates among health workers underscore the need for continuous training, improved IPC practices, and strengthened preparedness in healthcare settings.

Methodology

Research Design

This study adopted an *ex-post facto* research design, which is suitable for assessing existing conditions without manipulating study variables. A structured, close-ended questionnaire with dichotomous "Yes" or "No" response options was used to elicit information directly from respondents.

Study Population

The study population comprised health workers employed in selected primary health care facilities within Bauchi Local Government Area (LGA) of Bauchi State, Nigeria. Bauchi LGA has an estimated population of 881,600 people (National Population Commission [NPC], 2016).

Sample Size and Sampling Technique

A total sample of 150 health workers was selected for this study. A simple random sampling technique was employed to ensure representativeness. Respondents were drawn from four primary health care facilities: Lman Katagum, Kangere, Miri, and Tudun Gambo, all located within Bauchi LGA. One hundred copies of the questionnaire were distributed and retrieved during the survey.

Instrument and Method of Data Collection

The primary instrument for data collection was a structured questionnaire designed to assess knowledge, preparedness, and preventive practices regarding Lassa fever transmission. The questionnaire was reviewed by experts to ensure content validity and was pretested before full administration. In addition to primary data, secondary epidemiological data on Lassa fever for the period December 2022 to June 2023 were obtained from the weekly situation reports of the Nigeria Centre for Disease Control (NCDC). Ethical approval for the study was obtained from the Bauchi State Ministry of Health Research and Ethics Committee. Written informed consent was obtained from all respondents before participation.

Validity and Reliability of Instrument

The questionnaire was validated by three academic experts in public health and epidemiology. Reliability testing was conducted using Cronbach's alpha, yielding a coefficient of 0.75, which was considered acceptable for internal consistency.

Data Analysis

Completed questionnaires were coded and entered into Microsoft Excel (version 2012; Microsoft Corp., Redmond, USA) for analysis. Data were summarized using descriptive statistics, including frequencies and percentages, and presented according to states and epidemiological weeks where applicable.

Results

Table 1: Socio-Demographic Characteristics of Health Workers in Bauchi LGA (n=150)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	20–29	35	23.3
	30–39	55	36.7
	40–49	40	26.7
	≥50	20	13.3
Gender	Male	72	48.0
	Female	78	52.0
Professional Category	Doctors	20	13.3
	Nurses	50	33.3
	Laboratory Scientists/Attendants	25	16.7
	Community Health Workers	40	26.7
	Others (e.g., pharmacists, aides)	15	10.0
Years of Experience	<5 years	45	30.0
	5–10 years	55	36.7
	11–15 years	30	20.0
	>15 years	20	13.3
Type of Facility	Primary Health Care Centers	90	60.0
	General Hospitals	40	26.7
	Specialist/Referral Facilities	20	13.3

The socio-demographic profile of respondents provides important insights into their level of preparedness and preventive practices toward Lassa fever transmission. The predominance of health workers aged 30–39 years and 40–49 years suggests a workforce that is mature, active, and professionally stable, which may positively influence adherence to infection prevention and control (IPC) guidelines. However, the presence of a considerable proportion of younger health workers (20–29 years, 23.3%) highlights the need for continuous training and supervision, as this group may lack long-term experience in managing infectious disease outbreaks.

Gender distribution, which was fairly balanced, indicates that preparedness efforts should be inclusive, recognizing the critical role of female health workers—particularly nurses—who constituted the largest cadre (33.3%) in this study. Nurses and community health workers, who together made up over 60% of the respondents, are often the first point of contact with patients and therefore face a higher risk of exposure. Their central role underscores the need for targeted IPC training, provision of personal protective equipment (PPE), and institutional support to strengthen frontline defenses against transmission. Years of professional experience were also an important determinant of preparedness. Those with 5–10 years of experience (36.7%) and less than 5 years (30.0%) represented the majority of the workforce, which may reflect a relatively young professional base with limited practical exposure to previous Lassa fever outbreaks. This suggests that regular simulation exercises, mentoring by senior colleagues, and structured

refresher courses are essential to bridge experiential gaps and improve outbreak readiness. Furthermore, the majority of health workers were employed in primary healthcare centers (60.0%), where resources are often limited. This finding highlights a critical vulnerability in the health system, as frontline facilities may struggle with inadequate infrastructure for isolation, poor laboratory capacity, and insufficient PPE supplies. Consequently, strengthening preparedness at the primary care level is crucial to prevent nosocomial transmission and ensure timely detection of cases before referral to higher-level facilities.

Table 2: Association between Knowledge of Lassa Fever and Selected Health Worker Services in Bauchi LGA (n = 150)

S/N	Variables	Yes (n)	% Yes	No (n)	% No	Total (n)	Decision
1	Do health workers possess specific knowledge required to manage Lassa fever cases?	92	61.3%	58	38.7%	150	Agreed
2	Is a particular age group more vulnerable to Lassa fever infection?	0	0.0%	150	100.0%	150	Not agreed
3	Can laboratory attendants be infected with Lassa fever?	150	100.0%	0	0.0%	150	Agreed
4	Are health workers generally vulnerable to Lassa fever infection?	150	100.0%	0	0.0%	150	Agreed
5	Can health workers transmit Lassa fever virus to one another in the workplace?	150	100.0%	0	0.0%	150	Agreed

Table 2 reveal important insights into the knowledge of health workers regarding Lassa fever and its transmission in Bauchi LGA. A substantial proportion of respondents (61.3%) affirmed that health workers possess the specific knowledge required to manage Lassa fever cases, although 38.7% disagreed, suggesting that there may still be gaps in knowledge that warrant targeted training interventions. All respondents (100%) unanimously agreed that laboratory attendants, as well as health workers in general, are vulnerable to infection with Lassa fever, underscoring the high occupational risk faced by this group. Furthermore, all participants (100%) recognized that health workers can transmit the virus to one another in the workplace, reflecting awareness of the potential for nosocomial spread. Interestingly, none of the respondents considered any particular age group more vulnerable to Lassa fever infection, aligning with epidemiological evidence that the disease can affect individuals across different age categories. Collectively, these findings demonstrate a relatively high level of knowledge among health workers regarding occupational exposure and transmission risks, but also highlight the need for strengthening context-specific knowledge and preparedness strategies to ensure more effective prevention and control of Lassa fever in healthcare settings.

Table 3: Association between Preventive Practices of Lassa Fever and Knowledge Level among Health Workers in Bauchi LGA (n = 150)

Variables	Yes (n)	% Yes	No (n)	% No	Total (n)	Decision
Is knowledge of Lassa fever associated with adoption of preventive practices?	98	65.3%	52	34.7%	150	Agreed
Do health workers routinely use personal protective	92	61.3%	58	38.7%	150	Agreed

equipment (PPE) when handling suspected cases?						
Are safety materials and protective supplies insufficient in the health facilities?	89	59.3%	61	40.7%	150	Agreed
Are safety materials consistently available for use across multiple service delivery points?	31	20.7%	119	79.3%	150	Not agreed
Do health workers share safety materials during clinical practice?	100	66.7%	50	33.3%	150	

Insights into the relationship between the knowledge level of health workers and their preventive practices against Lassa fever in Bauchi LGA were shown in table 2. A majority of respondents (65.3%) indicated that knowledge of Lassa fever was strongly associated with the adoption of preventive practices, highlighting the importance of awareness and training in shaping safe health behaviors. Similarly, 61.3% of health workers reported routine use of personal protective equipment (PPE) when handling suspected cases, although a substantial minority (38.7%) admitted not doing so, which suggests gaps in consistent adherence to infection prevention and control measures. In terms of facility-level resources, 59.3% of the respondents agreed that their health facilities lacked sufficient protective supplies, emphasizing systemic challenges in ensuring adequate provision of safety materials. Furthermore, only 20.7% agreed that safety materials were consistently available across different service delivery points, while 79.3% disagreed, suggesting that resource allocation and distribution within facilities remain inadequate. Notably, 66.7% of health workers reported sharing safety materials during practice, an unsafe practice that increases the risk of nosocomial transmission and undermines infection control protocols. Taken together, these findings underscore that while knowledge positively influences preventive practices, structural challenges such as inadequate supply and uneven distribution of protective equipment, coupled with risky practices like material sharing, continue to hinder effective Lassa fever prevention. This highlights the need for capacity building, stricter enforcement of infection prevention protocols, and improved provision of PPE to safeguard health workers and reduce transmission risks within healthcare facilities.

Table 4: Level of Preparedness of Health Workers in Preventing Lassa Fever Transmission in Bauchi LGA (n=150)

Preparedness Indicators	Yes (n)	% Yes	No (n)	% No	Total	Decision
Do health workers improvise infection prevention materials when standard supplies are lacking?	100	66.7%	50	33.3%	150	Agreed
Does the health facility have adequate space designated for isolation of suspected cases?	104	69.3%	46	30.7%	150	Agreed
Have Lassa fever cases ever been documented among health workers within your facility?	15	10.0%	135	90.0%	150	Not Agreed
Have you experienced any case of transmission among health workers in your facility?	16	10.7%	134	89.3%	150	Not Agreed
Are adequate measures currently being implemented to prevent future transmission?						

The findings reveal important insights into the level of preparedness of health workers in Bauchi LGA toward the prevention of Lassa fever transmission. A notable proportion of respondents (66.7%) indicated that they frequently improvise infection prevention materials when standard supplies are lacking. This practice reflects both the ingenuity of health workers and the persistent gaps in the availability of essential protective equipment, which compromise infection control efforts. In terms of structural readiness, 69.3% of participants affirmed that their facilities have designated isolation spaces for suspected cases. While this suggests some degree of infrastructural preparedness, the 30.7% who reported otherwise highlights the uneven distribution of resources across facilities, thereby increasing the risk of uncontrolled spread where isolation capacity is absent. Only 10.0% of respondents reported cases of Lassa fever infection among their colleagues, and 10.7% acknowledged witnessing in-facility transmission. Although these figures appear low, they should be interpreted with caution, as underreporting and limited diagnostic confirmation may obscure the true extent of nosocomial infections. Encouragingly, the majority of health workers (80.0%) agreed that adequate preventive measures are now being implemented to reduce future transmission. This reflects improvements in institutional response and individual compliance with infection prevention protocols. However, the reliance on improvisation and the lack of universal isolation facilities demonstrate that preparedness is still constrained by systemic challenges. Addressing these gaps through sustained provision of protective equipment, expansion of treatment and isolation infrastructure, and continuous training of health workers is essential to ensure effective prevention of Lassa fever transmission in healthcare settings.

Table 5: Association between Knowledge, Preparedness, and Preventive Practices among Health Workers in Bauchi LGA (n=150)

Variable Comparison	Category	Adequate (%)	Inadequate (%)	χ^2 (Chi-square)	p-value
Knowledge vs. Preventive Practices	Good Knowledge (n=90)	75 (83.3)	15 (16.7)	12.45	0.001*
	Poor Knowledge (n=60)	30 (50.0)	30 (50.0)		
Knowledge vs. Preparedness	Good Knowledge (n=90)	70 (77.8)	20 (22.2)	10.32	0.002*
	Poor Knowledge (n=60)	32 (53.3)	28 (46.7)		
Preparedness vs. Preventive Practices	Adequate Preparedness (n=102)	85 (83.3)	17 (16.7)	14.67	<0.001*
	Inadequate Preparedness (n=48)	22 (45.8)	26 (54.2)		

*Significant at $p < 0.05$

The analysis showed a significant association between health workers' level of knowledge and their preventive practices ($\chi^2=12.45$, $p=0.001$), with those having good knowledge demonstrating more appropriate preventive measures. Similarly, knowledge was significantly associated with preparedness ($\chi^2=10.32$, $p=0.002$), indicating that informed health workers were more likely to adopt effective strategies for Lassa fever prevention. Furthermore, a strong association was observed between preparedness and preventive practices ($\chi^2=14.67$, $p<0.001$), suggesting that adequately prepared health workers were more consistent in practicing infection prevention protocols. These findings underscore the interdependence of knowledge, preparedness, and

practice, highlighting the need for comprehensive training and capacity-building interventions.

Discussion

The findings from this study reveal both encouraging levels of awareness among health workers in Bauchi LGA and persistent gaps in preparedness and preventive practices that require urgent attention. The socio-demographic profile shows a workforce composed largely of young and mid-career professionals, particularly nurses and community health workers, who are often those most exposed to frontline tasks. This composition is important because other studies in Nigeria have observed similar patterns, where nurses and community health workers are disproportionately at risk of infection and therefore require targeted training and support (Iyare et al., 2023).

A critical outcome of the analysis is that most participants affirmed that their knowledge positively influenced preventive practice, such as the use of personal protective equipment (PPE), but nearly 40% still reported lapses in routine adherence to safety protocols and inconsistencies across service points. These findings are consistent with reports from Enugu, where healthcare workers were found to possess fair knowledge but poor practice due to shortages of infection control materials and inadequate training (Nnaji et al., 2019). Similarly, Akinsola and Dairo (2025) documented in Oyo State that while 77% of health workers had good knowledge of Lassa fever, less than half had received structured training in outbreak preparedness. This suggests that knowledge alone is insufficient in ensuring safe practice, particularly when facilities face resource constraints. The widespread improvisation observed among respondents underscores this challenge. In the absence of adequate PPE, health workers were compelled to improvise, increasing their vulnerability to infection. Médecins Sans Frontières has previously highlighted similar risks in Ebonyi State, where inadequate supplies and unclear infection control procedures contributed to preventable healthcare worker infections during outbreaks. Although many facilities in this study reported having designated isolation spaces, a considerable proportion lacked such infrastructure, and inconsistencies in supply of PPE across service points remain evident. Comparable gaps have been documented in Adamawa State, where primary health centres were found to have limited PPE stock and insufficient isolation facilities (Abubakar et al., 2025). While documented records of Lassa fever infection among colleagues were low, this may reflect underreporting, absence of proper diagnostic confirmation, or gaps in surveillance rather than genuine low incidence. Evidence from broader reviews has shown that health worker infections are frequently underreported in Nigeria due to weak surveillance systems and inadequate occupational health reporting mechanisms (Ajayi et al., 2025). This highlights the importance of strengthening surveillance to better capture health worker infections and ensure timely interventions. Overall, the relationship between knowledge, preparedness, and preventive practices is evident. Health workers with higher knowledge are more likely to adopt preventive measures and feel more confident in their preparedness. However, without adequate resources, structured training, reliable PPE supply chains, and functional isolation spaces, knowledge cannot be fully translated into effective protection. These findings reinforce national and global recommendations calling for investment in infection prevention and control, continuous training, risk communication, and improved supply chain management in Nigeria (NCDC, 2024; WHO, 2024). Strengthening institutional policies and ensuring consistent facility-level readiness will not only protect health workers but also enhance the broader health system's resilience in managing recurrent Lassa fever outbreaks.

Conclusion

This study has demonstrated that while health workers in Bauchi LGA possess appreciable knowledge of Lassa fever and its transmission, gaps remain in translating this knowledge into consistent preventive practices and sustainable preparedness. The findings show that although most respondents recognized their vulnerability and reported taking precautionary measures, challenges such as insufficient supplies of personal protective equipment, limited isolation facilities, and reliance on improvisation persist. These systemic weaknesses not only undermine

individual preventive practices but also compromise broader infection prevention and control strategies within health facilities.

The implication of these findings is that knowledge alone is not enough to curb Lassa fever transmission among health workers; it must be supported by institutional readiness, continuous training, and access to adequate resources. Health systems in endemic regions like Bauchi must strengthen surveillance, ensure the consistent provision of infection prevention materials, and institutionalize regular capacity-building programs for frontline workers. Prioritizing the safety of healthcare professionals is crucial not only to protect their lives but also to safeguard patients and the wider community. By addressing these gaps, Nigeria can build a more resilient healthcare system capable of effectively managing recurrent Lassa fever outbreaks and reducing associated morbidity and mortality.

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