












Research Article

# Assessment of Knowledge, Perception and Practice Toward Lassa Fever Prevention Among Residents of Akure South Local Government, Ondo State

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## Abstract

Lassa fever is an extremely virulent and highly infectious disease endemic in West Africa, including Nigeria. This study aimed to assess the knowledge, attitudes, and preventive practices against Lassa fever among adult residents of Akure South Local Government in Ondo State, Nigeria. A cross-sectional study design was utilized, with data collected from adults in the LGA during a recent outbreak. The study involved systematic random sampling of approximately 300 adults, with data collected via pretested, interviewer-administered questionnaires. The study employed a multi-stage sampling technique and used a pretested interviewer-administered questionnaire. Data were analyzed using frequency distribution tables, simple percentages, and bar charts. The findings indicated that only 33.6% of respondents had good knowledge of Lassa fever, while 54.3% practiced good food and environmental hygiene. Most respondents were female, highly literate, and predominantly Yoruba. Despite high awareness, misconceptions about Lassa fever's origin and nature persisted, with many believing it was discovered in Congo or considering it a chronic disease. Effective prevention practices such as proper food storage were acknowledged, aligning with recommendations to avoid contact with *Mastomys* rodents and maintain cleanliness to prevent rodent infestations. The study concluded that there is a need for improved risk communication, ongoing sensitization, and specific educational campaigns to enhance understanding and preventive behaviors regarding Lassa fever. Further research is recommended to expand these findings across Ondo State and compare risk perceptions in affected and unaffected communities.

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## Keywords

Lassa Fever Prevention, Public Health Awareness, Rodent Control, Health Education

## 1. Introduction

Lassa fever is a highly infectious and virulent disease endemic to West Africa, particularly Nigeria. First identified in 1969 in Nigeria, Lassa fever is caused by the Lassa virus, a single-stranded RNA virus from the *Arenaviridae* family [1]. The primary reservoir of the virus is the *Mastomys natalensis*, commonly known as the multimammate rat, which can excrete the virus through urine, blood, and saliva without showing symptoms [2]. Humans typically become infected through direct contact with these secretions or by consuming contaminated food or rats [3].

Transmission to humans mainly occurs through exposure to infected rodent secretions. Secondary human-to-human transmission can also occur via contact with the blood or bodily fluids of infected individuals, posing a significant risk in healthcare settings [4]. The virus can be spread in nosocomial settings through reused needles, unsanitary conditions, and lack of proper protective equipment. The World Health Organization estimates that Lassa fever causes about 100,000 to 300,000 infections annually in West Africa, with around 5,000 deaths, though these numbers may be underreported due to inconsistent surveillance [5].

Nigeria has faced several major outbreaks of Lassa fever. In 2012, an outbreak resulted in 1,723 cases and 112 deaths, with a case fatality rate of 6.5% [6]. A subsequent outbreak from January to April 2018 saw 1,849 suspected cases across 21 states, of which 413 were confirmed, resulting in 114 deaths and a case fatality rate of 25.4% for confirmed cases [7]. During this period, 27 healthcare workers were infected, eight of whom died, highlighting the significant occupational risk [8]. The recurring outbreaks underscore the persistent threat of Lassa fever in Nigeria and the need for continuous surveillance and effective response mechanisms.

Ondo State in southwestern Nigeria is one of the high-risk regions for Lassa fever, experiencing annual outbreaks with substantial morbidity and mortality [9]. Although previous outbreaks were restricted to two local government areas (LGAs), the 2018 outbreak spread to six LGAs, despite risk communication efforts through various media channels such as radio, television, and community dialogue meetings [10]. This spread indicates that existing communication strategies might not be sufficient or properly implemented, necessitating a thorough evaluation and improvement of risk communication methods.

The need for effective public health interventions is critical, given the high morbidity and mortality rates associated with Lassa fever. Effective assessment of risk communication activities during outbreaks provides essential data for program

managers to identify gaps and implement corrective actions to enhance disease prevention. This study aims to assess the awareness and knowledge of Lassa fever preventive measures among community residents in the affected areas to enhance risk communication strategies and control the disease's spread. By understanding the level of awareness and the practices of the community, health authorities can design more effective communication strategies that can lead to better prevention and control of Lassa fever.

Moreover, this study's findings will be crucial for shaping public health policies and strategies, not only in Ondo State but across Nigeria and other Lassa fever-endemic regions. Improved communication and community engagement can lead to better compliance with preventive measures, ultimately reducing the incidence and spread of the disease. Thus, this research is not only significant for immediate outbreak management but also for long-term health planning and disease eradication efforts in the region [11].

## 2. Method

### 2.1. Study Design

This study employs a cross-sectional design to assess awareness and knowledge of Lassa fever preventive measures among residents of Akure South LGA. A cross-sectional design is appropriate for generating information at a single point in time, making it suitable for studies with time constraints. This design helps in understanding the prevalence and distribution of knowledge and attitudes towards Lassa fever within the population during the outbreak period.

### 2.2. Sampling Technique

A multi-stage sampling technique was used to ensure a representative sample and reduce selection bias. Akure South LGA comprises eleven wards: Aponmu, Gbogi/Isikan 1, Gbogi/Isikan 2, Ijomu/Obanla, Lisa, Oda, Odopetu, Oke-aro/Uro 1, Oke-aro/Uro 2, Oshodi/Isolo, and Owode/Imagun. In the first stage, the balloting method was used to randomly select two wards, Aponmu and Oda. In the second stage, two communities from each of these selected wards were chosen, ensuring a diverse representation. The final stage involved systematic random sampling of approximately 300 consenting adults from the four selected com-

munities. This approach ensured that the sample was proportionate to the population size of each community.

## 2.3. Data Collection

Data were collected using a pretested, interviewer-administered questionnaire. The questionnaire was divided into three sections: Section A covered socio-demographic characteristics; Section B assessed knowledge of Lassa fever symptoms and risk factors; and Section C evaluated risk perceptions. Six trained research assistants, familiar with the study area due to their involvement in the state's polio supplemental immunization campaign, administered the questionnaires. Daily field supervision ensured adherence to the study protocol, providing support to the research assistants. Each data collection team included at least one member fluent in the local language to facilitate communication with respondents who did not understand English. The questionnaires were translated orally into the local dialect where necessary. Participation was voluntary, and confidentiality was maintained throughout the study. Data collected were analyzed using the Statistical Package for Social Sciences (SPSS) version 23.0. The analysis included univariate analysis (frequencies and descriptive statistics) to summarize the data and bivariate analysis using chi-square tests to explore relationships between variables. The results were presented in tables and discussed in the following chapter, providing insights into the levels of awareness and knowledge of Lassa fever among the study population.

## 2.4. Ethical Consideration

Ethical considerations are paramount in any research involving human participants. This study did not involve any intervention programs or the collection of bodily fluids, thus posing minimal risk to participants. Informed consent was obtained from all participants before administering the questionnaires. Each participant signed a written consent form after being informed about the study's purpose, procedures, potential risks, and benefits. Ethical approval for the study was obtained from the Ondo State Health Management Board ethical department. The research adhered to the principles outlined in the Declaration of Helsinki, ensuring respect for all participants, beneficence, and justice. Additionally, the confidentiality of the participants' information was strictly maintained, with data being anonymized and securely stored to prevent unauthorized access.

## 3. Result

### 3.1. Socio-Demographic Information

From Table 1, 30% of the respondents were between the ages of 15-24 years, 30.0% were between the ages of 23-34 years, 23.3% were between 35-44 years, 10% were between 45-54 years while 6.7% were 55 years and above. Majority (60.0%) of

the respondents were female while 40.0% were male. The finding indicates that most of the respondents are female. 63.3% of the respondents had tertiary education, 20.0% had secondary education, and 13.3% had primary education while 3.3% had no educational background. The finding indicates that majority of the respondents possessed a high-level literacy. Majority (60.0%) of the respondents were married, 33.3% were single while 6.6% were divorced. Majority (73.3%) of the respondents were Yoruba, 21.7% were Igbo while 5.0% were Hausa. This indicates that majority of the respondent are of Yoruba extraction. 40.0% were civil servants, 33.3% were traders, and 16.7% were others like artisan etc. while 10% were farmers. Majority (88.3%) of the respondents were Christians, 10.0% were Muslims while 1.7% were traditionalist.

**Table 1.** Showing socio-demographic data of the respondents.

	Variable	Frequency N = 300	Percentage (%)
Age	15- 24	90	30
	25-34	90	30
	35-44	70	23.3
	45-54	30	10
	>55	20	6.7
Marital status	Single	100	33.33
	Married	180	60.0
	Divorced	20	6.6
Sex	Male	140	40.0
	Female	180	60.0
	None	10	3.3
Level of Education	Primary	40	13.3
	Secondary	60	20
	Tertiary	190	63.3
Ethnicity	Igbo	65	21.7
	Yoruba	220	73.3
	Hausa	15	5.0
	Other	0	0
Occupation	Trader	100	33.3
	Civil servant	120	40
	Farmer	30	10
	Other	50	16.7
Religion	Christian	265	88.3
	Islam	30	10.0
	Tradition	5	1.7

### 3.2. Knowledge of Resident on Lassa Fever Among Respondents

Table 2 reflects the result of the analysis of data obtained for the knowledge of resident on Lassa fever among respondents. From table 2, 83.3% of the respondents responded that they have heard about Lassa fever while 16.7% responded negatively to the fact. Majority (33.3%) of the respondents said they heard it from media, 23.3% from school, 26.7% from hospital while 16.7% never heard it before. 50.0% of the respondents

believed that the type of disease for Lassa fever is hemorrhagic fever, 33.3% said chronic disease while 16.6% do not know. 46.7% of the respondents believed that Lassa fever was discovered in Congo, 33.3% from Nigeria while 20.0% don't know. 63.3% of the respondents believed that the causal agent for Lassa fever is virus, 23.3% said bacterium while 13.3% don't know. Majority (50%) of the respondents believed that the symptoms and signs for Lassa fever is fever, 23.35 said vomiting, 16.6% said diarrhea, 2.3% bleeding, and 6.6% said headache while 1.0% said abdominal pain.

**Table 2.** Showing knowledge of resident on Lassa fever among respondents in figures.

	Variable	Frequency N = 300	Percentage (%)
Have you heard about Lassa fever before	Yes	250	83.3
	No	50	16.7
If yes, by which means	In school	70	23.3
	By media	100	33.3
	Hospital	80	26.7
	Never	50	16.7
Which type of disease is Lassa fever	Hemorrhagic fever	150	50
	Chronic disease	100	33.3
	Do not know	50	16.6
In which country the LASV has been discovered	Nigeria	100	33.3
	Congo	140	46.7
	Do not know	60	20
What is the causal agent	Bacterium	70	23.3
	Virus	190	63.3
	Do not know	40	13.3
To which family LASV belongs	Arenaviridae	140	46.7
	Filoviridae	120	40
	Do not know	40	13.3
What is the natural host of the causal agent	Rodent	230	76.7
	Monkey	40	13.3
	Do not know	30	10.0
	Fever	150	50
	Vomiting	70	23.3
Knowledge of If symptoms and signs	Diarrhea	50	16.6
	Bleeding	7	2.3
	Headache	20	6.6
	Abdominal pain	3	1.0

### 3.3. Knowledge Scores of Lassa Fever Among Respondents

Only 101 (33.6%) of residents in the study had good knowledge of Lassa fever. The difference was not statistically significant ( $p>0.05$ ).

**Table 3.** Aggregate knowledge scores of Lassa fever among respondents.

Knowledge score	N=300 (%)	t/ $\chi^2$	p value
Good	101 (33.6)		
Fair	110 (36.6)		
Poor	89 (29.7)	1.491	0.474
Mean score $\pm$ SD	7.25 $\pm$ 3.92	-0.802	0.423

### 3.4. Risk Perception of Residents on Lassa Among Respondents

**Table 4** Reflects the result of the analysis of data obtained for the Risk perception of residents on Lassa among respondents. From **table 3**, 36.7% of the respondents responded that Lassa fever is very serious, 26.7% serious, 23.3% neither serious nor not serious, and 10.0% slightly not serious while 3.3% responded that Lassa fever is not serious at all. 33.3% respondents responded that they can certainly contact Lassa fever in the future if they do not take any

preventive measures, 26.7% probably yes, 13.3% said probably not while 6.7% certainly not. 40.0% responded that they have very large chance of getting Lassa fever in the future if they do not practice any preventive measure, 30.0% said large chance, 16.7% not small, not large, 10.0% small chance while 3.3% very small chance. 33.3% of the respondents were concerned about contacting Lassa fever, 30.0% were very concerned, and 13.3% slightly concerned, 6.7% not concerned while 16.7% were not concerned at all. 36.7% responded certainly it is necessary to carry out preventive measures against Lassa fever, 33.3% probably not, 3.3%, while 6.7% said certainly not.

**Table 4.** Showing risk perception of residents on Lassa among respondents in figures.

	Variable	Frequency N = 300	Percentage (%)
How serious do you think Lassa fever is	Very serious	110	36.7
	Serious	80	26.7
	Neither serious nor not serious	70	23.3
	Slightly not serious	30	10
	Not serious at all	10	3.3
How would you feel if you were to contact LF next year	Very serious	130	43.3
	Serious	80	26.7
	Neither serious nor not serious	30	10
	Slightly not serious	20	6.7
	Not serious at all	40	13.3
Do you think that you can contact Lassa fever in the future if you do not take any preventive measures	Certainly Yes	100	33.3
	Probably yes	80	26.7
	Perhaps not, perhaps yes	60	20.0
	Probably not	40	13.3
	Certainly not	20	6.7

	Variable	Frequency N = 300	Percentage (%)
What do you think are chances of getting Lassa fever in the future if you do not practice any preventive measure	Very large chance	120	40.0
	Large chance	90	30.0
	Not small, not large	50	16.7
	Small chance	30	10.0
	Very small chance	10	3.3
Are you concerned about contacting Lassa fever	Very concerned	90	30.0
	Concerned	100	33.3
	Slightly concerned	40	13.3
	Not concerned	20	6.7
	Not concerned at all	50	16.7
It is necessary to carry out preventive measures against Lassa fever	Certainly Yes	110	36.7
	Probably Yes	100	33.3
	Perhaps not, perhaps Yes	60	13.3
	Probably not	10	3.3
	Certainly not	20	6.7

### 3.5. Preventive Practice of Lassa Fever Among Respondents

Table 4 reflects the result of the analysis of data obtained for the preventive Practice of Lassa fever among respondents. From table 4. Majority (96.7%) of the respondents believed that proper storage of food using sealed containers can prevent the transmission on Lassa fever while 3.3% responded negatively to the

fact. 83.3% of the respondents believed that Avoiding food contaminated by rats is preventive while 16.7% responded negatively. 93.3% of the respondents believed that ensuring good environmental hygiene can prevent the transmission of Lassa fever while 6.7% responded negatively. 90.0% of the respondents believed that Avoiding contact with people infected with Lassa is preventable while 10.0% responded negatively. 91.7% of the respondents believed that avoiding rat consumption can prevent Lassa fever while 8.35 responded negatively to the fact.

**Table 5.** Showing preventive practice of Lassa fever among respondents in figures.

	Variable	Frequency N = 300	Percentage (%)
Proper storage of food using sealed containers can prevent the transmission on Lassa fever	Yes	290	96.7
	No	10	3.3
Avoiding food contaminated by rats is preventive	Yes	250	83.3
	No	50	16.7
Ensuring good environmental hygiene can prevent the transmission of Lassa fever	Yes	280	93.3
	No	20	6.7
Avoiding contact with people infected with Lassa is prevent	Yes	270	90.0
	No	30	10.0
Avoiding rat consumption can prevent Lassa fever	Yes	275	91.7
	No	25	8.3



### 3.6. Practice Scores of Lassa Fever

At baseline, 163 (54.3%) of residence practiced good food and environmental hygiene. There was no statistical significant different in baseline ( $p > 0.05$ ).

**Table 6.** Aggregate practice scores of Lassa fever.

Practice score	N=300 (%)	t/ $\chi^2$	p value
Good	163 (54.3)		
Poor	137 (45.6)	0.260	0.613
Mean $\pm$ SD	4.89 $\pm$ 2.73	2.367	0.341

## 4. Discussion

The research revealed that the respondents' age distribution was as follows: 30% were between 15-24 years, 30% were between 25-34 years, 23.3% were between 35-44 years, 10% were between 45-54 years, and 6.7% were 55 years and above. This distribution indicates a relatively young population, with 60% of respondents below 35 years. According to a study by the United Nations Population Fund (UNFPA), such age distributions are typical in many developing countries, where a large proportion of the population is under 35 years old [12]. The high percentage of younger individuals in this study could impact health education strategies, as younger populations may have different information needs and media consumption habits compared to older groups [13].

The findings showed that 60% of the respondents were female, while 40% were male. This skew towards female respondents could influence the study outcomes, particularly in health-related research where gender can significantly impact perceptions and behaviors. For instance, women are often more involved in health care decisions and have different health care needs and practices than men [14]. The World Health Organization (WHO) reports that women are more likely to seek health information and use health services than men [15]. This could explain the higher representation of women in this study.

The study indicated that 63.3% of respondents had tertiary education, 20% had secondary education, 13.3% had primary education, and 3.3% had no formal education. The high level of tertiary education among respondents suggests a relatively literate population, which is crucial for effective health education and intervention programs. A similar study on health literacy found that higher educational attainment is associated with better health knowledge and practices [16]. This suggests that the respondents in this study might be more receptive to health education initiatives, given their higher educational levels.

The research found that 60% of the respondents were married, 33.3% were single, and 6.6% were divorced. Marital

status can influence health behaviors and outcomes. For instance, married individuals often have better health outcomes compared to their single or divorced counterparts, partly due to social support and shared responsibilities [17].

The study revealed that 73.3% of respondents were Yoruba, 21.7% were Igbo, and 5% were Hausa. This ethnic distribution aligns with the demographics of certain regions in Nigeria, where these ethnic groups are predominant [18]. Ethnicity can play a significant role in health behaviors and attitudes due to cultural beliefs and practices [19].

The study showed that 88.3% of respondents were Christians, 10% were Muslims, and 1.7% were traditionalists. Religion can significantly influence health behaviors and attitudes. Research indicates that religious beliefs can impact health practices, such as dietary habits and the acceptance of medical interventions [20].

Only 33.6% of respondents had good knowledge of Lassa fever, a figure that is not statistically significant ( $p > 0.05$ ). This indicates a gap in knowledge about the disease, despite the majority having tertiary education. This finding is consistent with research by Ea et al. [21], which found that less than 20% of primary care health workers had good knowledge of Lassa fever, although 97% had heard of the disease. This aligns with findings from other studies on hemorrhagic fevers. For instance, a study on Crimean-Congo hemorrhagic fever in Iran found that 50% of health professionals had good knowledge of the disease [22], while another study in Turkey found that over 68% of primary health workers had good knowledge of Dengue fever [23].

At baseline, 54.3% of residents practiced good food and environmental hygiene ( $p > 0.05$ ). This practice is crucial in preventing the spread of Lassa fever, which can be transmitted through contaminated food. Proper storage of food using sealed containers can prevent transmission, as corroborated by Ogbu [24] who emphasized the importance of avoiding contact with *Mastomys* rodents and maintaining clean environments to prevent rodent infestations.

The findings revealed that 50% of respondents believed Lassa fever is a hemorrhagic fever, 33.3% thought it was a chronic disease, and 16.6% did not know. Additionally, 46.7% believed Lassa fever was discovered in Congo, 33.3% in Nigeria, and 20% did not know. These misconceptions highlight the need for improved health education about Lassa fever. The findings align with a study by Lee et al. [25] in Singapore, which found that primary care physicians had adequate knowledge of Dengue fever, indicating that professional knowledge can vary significantly depending on the disease and region.

The study established that proper storage of food using sealed containers can prevent Lassa fever transmission. This finding supports Ogbu's [24] recommendations for preventing primary transmission of Lassa virus through contact with rodents. Implementing these preventive measures, including trapping and using rodenticides, is crucial in endemic areas to

reduce rodent populations and prevent disease transmission.

## 5. Conclusion

In conclusion, the poor knowledge of Lassa Fever among the respondents, and the high proportion of low perceived benefit of Lassa Fever infection preventive practices shows a gap in the content and acceptance of Lassa Fever risk communication information in the state despite the high level of perceived threat of Lassa Fever and self-efficacy towards Lassa Fever preventive practices. In addition, the significant relationship between good knowledge and perceived threat (perceived severity and perceived susceptibility) of Lassa Fever infection and perceived benefit of Lassa Fever preventive practices further buttresses the importance of good and accurate knowledge of Lassa Fever on the perception which has great import on Lassa Fever preventive practices. Therefore, there is a need to reexamine the risk communication content of the state towards Lassa Fever in the community with special focus on the males and younger population as well as a need for a continuing education of the populace on the dangers of the disease at the community level.

## 6. Recommendation

1. There should be a closer analysis of the Lassa Fever risk communication content in the State (public and private). Sensitisation through media platforms should be all year round in the state with an added focus on the youth, female and male sex in addition to anti- Lassa Fever stigma messages.
2. The findings from this study serve as a guide to create Akure South Local Government Area specific risk communication content towards Lassa Fever infection prevention and control.
3. In addition, there should be a scale up of this study to the whole of Ondo State as well as a comparative study to compare the risk perception towards Lassa Fever infection of residents living in affected and unaffected communities.
4. Residents should be further educated on the importance of avoiding bush burning and open air drying of their food.

## Abbreviations

LGA	Local Government Area
UNFPA	United Nations Population Fund
WHO	World Health Organization

## Author Contributions

**Ebenezer Obi Daniel:** Data curation, Formal Analysis,

Investigation, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing

## Conflicts of Interest

The authors declare no conflicts of interest.

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