



Lassa Fever Knowledge, Belief, Risk Communication Sources and Information Needs of Rural Farmers in Affected Communities of Ebonyi State, Nigeria

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ABSTRACT: Lassa fever (LF) is a tropical health challenge affecting farmers' performance in the farm, hence, its spread must stop and prevented. Therefore, the objective of this paper was to assess the rural farmers' knowledge, belief, risk communication sources and information needs of Lassa fever affected communities of Ebonyi State, Nigeria using appropriate standard methods including questionnaire and oral interview on 650 farmers. Data obtained and analyzed reveals that 100% of the farmers are aware of Lassa fever. Over 90% of them could recognize symptoms of Lassa fever such as general body weakness, headache, fever, bleeding among others. They have knowledge of the transmission such as eating of rats(79.1%), eating rat contaminated foods(86.7%), staying with infected person(90.3%), and for prevention, washing of hands (63.6%), not eating rats(83.1%), cleaning of the environment(92.3%). The farmers believed that Lassa fever is manipulated spiritually (61.1%), is caused by the devil(74%), punishment from God(81.1%), cured with local herbs(92.4%). They get information about Lassa fever from television, radio, fellow farmers, extension agents, village neighbors among other sources. To be well informed, they need more information on the origin, causes, treatment, transmission, prevention and cost.

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The Lassa fever virus (LFV), a member of the Arenaviridae family, is the causative agent of Lassa fever (LF), an epidemic-prone zoonotic viral hemorrhagic illness (WHO, 2017). The reservoir is the multimammate, peri-domestic rat *Mastomys natalensis*. Nigeria, Liberia, Sierra Leone, Benin, Ghana, Guinea, and Mali are endemic for LF and North America and Europe have also received reports of it (ECDC, 2016). All age groups and both sexes are

affected by LF (WHO, 2017). In West Africa, there are between 300,000 and 500,000 cases and 5,000 fatalities annually (Ogbu *et al.*, 2007). Lassa fever case fatalities range widely depending on the situation; they can be as low as 2% overall, 15-20% in hospitalized patients, around 50% during epidemics, and as high as 80% during the third trimester of pregnancy (WHO, 2017). Nigeria has recorded case fatality rates ranging from 3 to 42% (NCDC, 2019). The dry season, which

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runs from November to April, is often when the frequency of LF is highest, and outbreaks frequently occur during this time (NCDC, 2019). Lassa fever mostly spreads from rodent to human. There have been reports of human-to-human transfer. Since there isn't a vaccine for Lassa fever at this time, the main strategy for prevention is to break the chain of transmission (NCDC, 2019; WHO, 2017). The general public is advised to take several steps by the Nigeria Centre for Disease Control (NCDC), including maintaining personal and environmental hygiene, washing your hands frequently, storing food in rat-proof containers to reduce rodent-human interaction, and reporting symptoms of illness to the treatment center as soon as possible. Therefore, human behavior—specifically, whether or not those who are at risk follow behavioral recommendations—determines the effectiveness of epidemic prevention and control (Poletti, *et al.*, 2012a). This is due to the fact that misconceptions might impede response attempts and promote further spread of the disease as human behaviour is based on attitudes, belief systems, opinions and awareness of a disease (Poletti, *et al.*, 2012b). According to the Health Belief Model (HBM), a person will start a certain health activity to prevent a dangerous disease (threat) if they believe they are at risk of getting it. Adoption of this healthy habit won't happen, though, until the advantages of it exceed the disadvantages. Triggers (cues to action), which can be internal or external, intensify such beliefs (Janz and Becker, 1984; Rosenstock *et al.*, 1988). Furthermore, the model suggests that an individual's opinions can be influenced by a number of variables, including knowledge about diseases and demographics. This may have an indirect impact on a person's actions and behavior (Chapman and Skinner, 2008; Rimer and Glanz, 2008; Stretcher and Rovenstock, 2005). Another significant factor impacting health behavior is self-efficacy, as individuals are more likely to adopt a practice if they have high self-confidence and belief in their ability to take on that behavior. Even though LF was identified fifty years ago, there is still much to learn about it, including the variables impacting how people behave in regards to the disease's prevention and control. Comprehending the community's perception of LF risk is essential for the effective formulation and execution of preventative and control measures, particularly in risk dissemination initiatives (WHO, 2019).

According to Manno III, Lively, Manno, Cheng and Lau (2018), risk communication sources affect how risk messages are processed and interpreted as well as how people behave and think about health risks (Kott and Limaye, 2016). Furthermore, regular exposure to health risk information improves audience

comprehension of the message (Wakefield, Loken and Hornik, 2010). Therefore, the degree to which information about health risks, like the Lassa virus, is exposed to people influences how they interpret that information. In Nigeria, Lassa hemorrhagic fever has continued to be a recurrent problem for the past ten years. With a high incidence of confirmed cases and a death rate in many cases, Lassa fever epidemics have had a devastating impact on healthcare professionals and local populations because the vaccine trial has not ended. The intricacy of Nigeria's low-income status and inadequate healthcare infrastructure adds to the burden of the Lassa fever pandemic (Ben-Enukora *et al.*, 2019b). In order to raise awareness and advance understanding of the illness specifically in endemic regions and throughout Nigeria, risk communication interventions are implemented using a variety of communication channels, including print, interpersonal, and electronic media. The disease's cause, pathways of transmission, risk factors, risk mitigation or preventative actions, and available treatments for Lassa fever patients are the main topics of the risk communication messaging. Nonetheless, despite varied attempts at risk communication for disease prevention in Nigeria, there have been ongoing outbreaks of Lassa fever, with the majority of cases occurring in the states of Ebonyi, Edo, and Ondo (Nigeria Centre for Disease Control and Prevention, (NCDC) 2017; 2018; 2019; 2020; 2021). In this context, risk communication is understood to play two roles: it should build capacity for understanding and action competence as well as a thorough understanding of health risks among the general public and health officials. It should also prepare for crisis management.

Communication of hazards is not the only aspect of risk communication. Building public health capacity is necessary to empower various publics to recognize health hazards and take appropriate action (Larson, 2013; ECDC, 2011). Public health officials, however, frequently view their duties as primarily informational in nature. They frequently depend primarily on an antiquated information technology model that holds that messages are sent to addressable receivers by a somewhat static, unilateral sender (Weaver and Shannon, 1963). Information and communication have changed in reality. The public is no longer viewed as a passive group that should be subservient to organizations who are supposed to be trusted when they provide advice and directions. The sender-message-recipient communication paradigm is ill-suited to comprehending how people communicate, absorb information, and decide what to do. People must be aware of the health dangers they face and the steps they may take to safeguard their safety and well-

being during public health emergencies. People are better equipped to make decisions and take action to safeguard themselves, their families, and their communities from hazardous health dangers when accurate information is supplied early on and through channels and languages that people can use and comprehend (WHO, 2023). An essential component of any emergency response is risk communication. It is the instantaneous sharing of knowledge, suggestions, and viewpoints between professionals, politicians, and community leaders and those who are most vulnerable. In times of natural catastrophes and epidemics, efficient risk communication enables those who are vulnerable to understand and take preventive measures (WHO, 2021; WHO, 2020). It enables professionals and authorities to respond to people's wants and concerns thus making the advice they provide relevant, trusted and acceptable.

One of the three most affected states that reports regular LF outbreaks is Ebonyi State (NCDC, 2019). During the LF outbreaks in 2018, 2019 and 2023, the Abakaliki, Ebonyi and Izzi Local Government Areas (LGA) in Ebonyi State had the highest percentage of confirmed LF patients in the State. Using the HBM in these LGAs during a state-wide LF outbreak, we assessed the resident's knowledge, belief, risk communication sources available to the rural farmers and information needs about LF infection. Several works have carried out on LF both in Ebonyi and other States looking at the health concern of children, mothers and the elderly. Without concern for the people who produce foods; the Farmers. We therefore concentrated on farmers because no empirical work has been done in the areas bringing out the food security implications of the LF outbreak. Therefore, the objective of this paper was to assess the rural farmers' knowledge, belief, risk communication sources and information needs of Lassa fever affected communities of Ebonyi State, Nigeria.

MATERIALS AND METHODS

Study Area: This study was done in Ebonyi State. The state's borders are as follows: 70 km (43 miles) to the south, Enugu to the west, and Benue to the north (about 96 km; mostly across the Ichelle and Igbe Rivers); 198 km (123 miles) to the east, which includes a portion of the River Aloma and Cross River (EBSG, 2022). It consists of three Agricultural zones (Ebonyi South, Ebonyi North, and Central) and three Senatorial zones. Thirteen Local Government Areas (LGAs) make up Ebonyi (see fig 1). Ebonyi State experiences a humid tropical climate with two distinct seasons, the wet and dry, lasting eight and four months, respectively. The average temperature is between 16 and 28 degrees Celsius during the rainy

season and between 20 and 38 degrees Celsius during the dry season (EBSG, 2022). In December and January, Harmattan winds are common. The average annual temperature is 28 degrees Celsius, and the average annual humidity is between 50 and 60 percent. The region receives 2500 mm of precipitation on average year (EBSG, 2022). In addition to being a large producer of rice, yam, potatoes, maize, beans, and cassava, Ebonyi has a sizable basket market in Nigeria (Ibenegbu, 2017).



Fig 1: Map of Ebonyi State showing the LGAs and Agricultural Zones

Sample Collection and Analysis: Purposive sampling was done in Abakaliki LGA from Ebonyi North, Ikwo LGA from Ebonyi Central and Onicha LGA from Ebonyi South ((Bhandari, 2023; Nigeria Centre for Disease Control and Prevention, (NCDC) 2017; 2018; 2019; 2020; 2021; NCDC, 2022). Then, three most affected Wards/communities were also purposively chosen from each LGA. From Abakaliki, we chose Amagu Unuhu, Izzi Unuhu and Ndiagu. In Ikwo, we chose Echialike, Inyimagu II and Ndiagu Echara II. While in Onicha, we chose Agbabor-Isu, Enuagu-Onicha and Ugwo-Oshiri, making a total of 9 wards/communities. Finally, 10% of the respondents was selected proportionately from a list of about 6500 affected households obtained from the Epidemiology Team Office of the Nigeria Centre for Diseases Control (NCDC) in Abakaliki, Ebonyi State. From Amagu Unuhu (80), Izzi Unuhu (64) and Ndiagu (74). In Echialike (72), Inyimagu II (80) and Ndiagu Echara II (70). While we selected (70) from Agbabor-Isu, Enuagu-Onicha (74) and Ugwo Oshiri (66). This gives a total of 650 respondents. Primary data for the study was gathered through the use of a structured questionnaire and oral discussions.

Data Analysis: Data was analyzed using simple descriptive tools such as frequency counts, and percentages, presented in tabular forms.

RESULTS AND DISCUSSION

Farmers knowledge of Lassa fever in study area: Knowledge determines action and taken and response to solve a perceived problem. The table (1) determines farmers' knowledge of Lassa fever by the symptoms, mode of transmission and treatment/prevention practices. All the farmers (100%) know about the outbreak of Lassa fever. They also have the knowledge of the symptoms such as general body weakness/pains (77.8%), headache (76%), fever (80%), red eyes (90.6%), weight loss (98.6%), and facial swelling (89.3%), and diarrhea (92.7%), sore throat (59.1%), bleeding (72.9%), vomiting (87.2%). The notice and observation of these signs tell the farmers that there is danger. This is not ordinary malaria. On transmission, they said eating of rats (79.1%) could be a cause Lassa fever, eating food contaminated by rats (86.7%), staying with sick infected person (90.3%) or even having contact with such individual, could be a spiritual attack (89.1%). During oral discussion with farmers, they said that the rat could not be an ordinary rat, which something must be behind the rat. Lassa fever can be prevented by praying to God (77.5%), not eating rat (83.1%), cooking food well (74.9%), not touching rat (90.9%), cleaning environment (92.35%), washing hands after touching items (63.6%), going to the hospital (91.3%), and covering food very well (88.6%).

These findings agree with Olukemi *et al.*, (2023) on Knowledge and practices associated with Lassa fever in rural Nigeria: Implications for prevention and control. It was observed that while 534 (79.11 percent) had heard of the disease previously, only 286 (53.6%) knew that Lassa Virus was the disease's causative agent. According to the data, 183 people, or 34.3%, were aware that the disease is spread by consuming rats, 25.7% thought it can be spread by eating food tainted with rat urine or excrement, and 14.4% thought it could be spread by coming into direct contact with an infected individual.

The majority of respondents identified fatigue (38.8%), fever (21%), and general weakness (19.9%) as common symptoms linked to LF. The least common symptom reported by pregnant women was miscarriage (24%), and 53 people (9.9%) were completely unaware of the disease's symptoms. Of the respondents, 154 thought there was a vaccine for LF, and only 259 (48.5%) thought it could be avoided. Of the respondents, 61% will visit a hospital as soon as they notice symptoms, 14% will self-medicate, and

11% will speak with a religious leader. Just 29% of respondents thought that rat holes could be blocked to stop LF, 43% said they would practice good hygiene and maintain a clean environment, and 17% said they would keep trash away from their homes.

Table 1: Lassa fever knowledge of farmers

Statement/Questions	*Frequency	Percentage
Do you know about Lassa fever?		
Yes	650	100
No	-	-
What signs do Lassa fever person show?		
General body weakness/pains	506	77.8
Headache	494	76.0
Fever	520	80.0
Vomiting	567	87.2
Bleeding	474	72.9
Sore throat	384	59.1
Diarrhea	603	92.7
Facial swelling	581	89.3
Red eyes	591	90.6
Weight loss	641	98.6
How can someone get it		
By eating rat	514	79.1
Eating food contamination with rat urine	564	86.7
Staying with infected person or contact	587	90.3
Spiritual attack	579	89.1
How can lassa fever be prevented?		
Praying to God	504	77.5
Not eating rats	540	83.1
Cooking food very well	487	74.9
Don't touch rat or infected person	591	90.9
Cleaning environment	600	92.3
Washing hands after touching items	414	63.6
Going to the hospital for treatment	594	91.3
Covering foods very well	576	88.6

*Multiple Responses

Beliefs/myths Held by Farmers of Lassa Fever: Table 2 showed the beliefs farmers in the study have of Lassa fever. They believed that it is punishment of God (81.1%), can only affect the poor (82.1%). They said it is manipulated spiritually against one (61.1%), it is caused by the devil (74%), witches/wizards are responsible for it (78.4%), affects mostly the white peoples (63.1%), it can be cured spiritually (76.7%), traditional methods can cure it (93.8%), Lassa fever is not real (81.5%), government is blowing it out of proportion (95.3%), sins caused it (75.6%) as local herbs be made to cure it (94.4%). In a study by Izeke, *et al.*, (2024) on the Mythical Construction of the Spread of Lassa Fever among Garri Marketers: Empirical Evidence from Edo State, Nigeria, it was observed that a sizable percentage of respondents (39.5%) denied that Lassa fever was an epidemic,

instead attributing its spread to divine vengeance. In the meantime, 44.6 percent of respondents thought that the government was taking advantage of the circumstances to get money from foreign donors and international organizations such as the World Health Organization (WHO). Furthermore, there was a widespread belief that rats, who are typically thought of as harmless animals that can be found in both urban and rural homes, could not be the cause of Lassa fever. They questioned the reasoning behind abruptly attributing the Lassa fever virus to rats, who have lived alongside people for years. Some people speculated that the government's focus on rats as the disease's vector was a ploy to get foreign funding for Nigeria. Concerns were also expressed about how international funds were distributed, claiming that a significant amount was diverted from the goal of curing disease and used for other purposes, as was made clear in a number of declarations. Lassa fever was similarly characterized by some garri marketers at Iwareke in Etsako Central as the typical malaria that can be with other medications and herbs (Izekor, *et al.*, 2024).

During oral interview, the farmers said there are certain areas in which our government cannot be trusted. The money that is released is typically wasted and looted, and it is thought that they use some of these epidemic occurrences to obtain funding from the white people. There should be better hospitals in all of the nation's major towns and cities where Lassa fever, if it exists, can be treated, given the level of assistance received on its own. No such thing as Lassa fever exists, and even if it did, most of us would have died long ago. Although rats have always lived in our homes, no one has ever died from a disease of this kind there (Izekor, *et al.*, 2024). Rather, people with severe malaria and typhoid are frequently mislabeled as having Lassa fever, just as many people were wrongly identified as Covid-19 cases in 2020.

The following is a quote from a marketer in Ewarake, Nigeria's Etsako Central Local Government Area. It is important to remember that if the proper information and education are not actively promoted, these kinds of ideas may help Lassa spread. The circumstances listed above the intended risk in light of the Lassa fever epidemic in the research region. Therefore, it is advised that the state government of Ebonyi State empower Extension Officers, health professionals, community leaders, community-based organizations, and educational institutions to engage in a vigorous campaign and raise awareness about the dangers of Lassa fever. This will help dispel some of the myths that the community and others have about the disease in order to create a healthy and disease-free environment (Izekor, *et al.*, 2024).

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Table 2: Beliefs held by respondents about Lassa fever

Beliefs held	*Frequency	Percentage
Lassa fever is punishment from God	527	81.1
Can only afflict the poor	534	82.1
It is manipulated spiritually against one	397	61.1
It is caused by the devil	481	74.0
Witches\wizards are responsible for it	510	78.4
It afflicts mostly white skinned people	410	63.1
It can be cured spiritually	499	76.7
Traditionally method can cure it	610	93.8
It is not real	530	81.5
Government is blowing it aloud	620	95.3
Sun causes lassa fever on mankind	492	75.6
Local herbs\mixtures can cure it	601	92.4

*Multiple Responses

Lassa Fever Risk Communication Sources: Information provisioning makes for informed decision making to solve immediate problems affection health of individuals. Several sources are used to provide this all important information. Table 4 showed the various agencies through which Lassa fever information became available to the respondents. These sources could be formal or informal. The formal sources include television (58.6%), radio (90.7%), health centres (98.1%), newspapers/magazines (43.2%), extension agents (77.5%), internet/social media (33.4%). The informal sources were community leaders (99.5%), family/friends (78.4%), fellow farmers (99.2%), cooperative societies (75.8%), village meetings (79.6%) and town criers (69.3%). Information sources are important in the aspect of research because they play a vital role in accuracy, relevance and credibility of the work and research we are doing. Through credible risk communication sources, we know whether our information is reliable or not.

They provide evidence and data upon which our findings base. Communication sources show authenticity of evidence or documents presented. These provide a foundation of knowledge, guarantee validity and reliability of findings, offer great context/background information, support our arguments with evidence and keep us up to date. Newspapers, ads, and fliers are still common forms of conventional communication, but other tools like advertisement games are starting to carve out their own place in the market. Office productivity tools, phone, fax, and email are examples of virtual work tools.

Table 3: Risk Communication Sources

Sources of Awareness	*Frequency	Percentage
Television	381	58.6
Radio	590	90.7
Health centers	641	98.1
Newspapers/Magazine	281	43.2
Extension Agents	647	99.5
Community Leaders	510	78.4
Family/friends	635	97.6
Fellow farmers	645	99.2
Church	623	95.8
Cooperate & Society	480	73.8
Village meetings	518	79.6
Seminars	250	38.4
Posters/banners	504	77.5
Internet/social media	230	35.4
Town Crier	458	69.2

*Multiple response

Lassa Fever Information Needs of Farmers: This section describes the desires of the farmers to locate, obtain and acquire credible information on Lassa fever to satisfy their conscious needs. To get away from their beliefs and myths on LF, they now seek truthfully, the right information. They therefore seek the following origin of Lassa fever (87.6%), how it is transmitted (93.9%), symptoms/signs of LF (74.9%), causes of LF (96.1%), those who are risk mostly (76.6%), how to diagnose LF (87.6%), treatment of LF (97.9%), prevention of LF (99.2%), where to go for treatment (76.4%) should they contract LF, cost of treatment of LF (78%), will victim die quickly (85.6%), does LF go away on its own (81.6%) without treatment, what is the incubation period (74.1%) before manifestation, is it the same as yellow fever (76.7%) and will infected persons be isolated (78.7%) as in the cases of other epidemics such as malaria, ebola and HIV AIDS. A good knowledge of the above will close the gap between what is known and what need to be known. The above will help in decision making, learning and education and innovation/creativity.

Table 4: Lassa Fever Information Needs

Information Needs	*Frequency	Percentage
Origin of Lassa Fever	570	87.6
How Lassa Fever is transmitted	610	93.8
Signs/symptoms of Lassa Fever	487	74.9
What causes of Lassa Fever	625	96.1
Those affected by Lassa Fever	489	76.6
How to diagnose Lassa Fever	570	87.6
How to treat of Lassa fever	630	96.9
How we can prevent of Lassa Fever	645	99.2
Where to go for treatment?	497	76.4
Cost of treatment of LF?	507	78.0
Will victim die quickly?	557	85.6
Does it go away on its own?	531	81.6
What is the incubation period?	482	74.1
Is it the same as yellow fever?	497	76.4
Will infected person be isolated?	512	78.2

*Multiple responses

In order to provide the community with helpful information, information professionals, especially Agricultural Extension Staff, acting as information brokers must perform an information needs assessment. This will enable them to identify the various critical information needs of the community and develop strategies to support their users and information societies. A critical component of any information literacy project, regardless of the type of work being done— research, curriculum design, or service development—is the assessment of information needs. It assists you in determining the needs, objectives, and preferences of your intended audience so that you can adjust your information solutions appropriately.

Conclusion The menace of Lassa fever is not new to the respondents as they have full knowledge of its outbreak. The farmers know much about the symptoms of Lassa fever such as headaches, weakness and pains, facial swelling and many more. They believe that Lassa fever is a punishment from God to those who are infected. They believe that local herbs can cure it. However, to break free from superstitious belief of Lassa fever coming from God, right information is key. Communication of the right information is essential to change knowledge and perception of local farmers. Through many risk communication sources, such as radio, television, family members, friends, cooperative meetings, they will become more aware of the menace of Lassa fever, they improve their knowledge and understanding, change their minds and keep to the prevention practices. The information needed are origin of Lassa fever, transmission of Lassa fever, diagnosis of Lassa fever, treatment and cost among other information. Proper training and education of farmers are necessary for improvement.

Conflict of Interest: The authors declare no conflict of interest.

Data Availability Statement: Data is available upon request from the first author

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