EDITORIALS AND COMMENTARIES

Current Trends of Endemic Lassa fever amidst COVID-19 in Nigeria

Omojuyigbe, JO[1], Oladipo, HJ[2], Adegbite, MA[2], Babatunde, Y[2], Sokunbi, TO[1], Adedeji, O[2] and Abdulmumin, I[2]

[1] Obafemi Awolowo University, Ile-Ife, Nigeria

[2] University of Ilorin, Ilorin, Nigeria

Abstract

Lassa fever is a disease endemic in West Africa caused by the Lassa virus (LASV). The emergence of the COVID-19 pandemic has put an extra burden on Nigeria in the fight against infectious disease outbreaks. Lassa fever cases peak seasonally in the first three months of the year. Despite the reduction in the epidemiological trends in 2021, the current trends of the Lassa fever cases in Nigeria in 2022 indicate that the virus is still being actively transmitted in the country with some large states regarded as high burden areas. There are requirements to increase in vaccine uptake for COVID-19, to strengthen the testing capacities for LASV, and develop a licensed LASV vaccine, in order to eradicate these viral diseases of concern. This study aims to identify the current trends of Lassa fever in Nigeria, measures and challenges and suggest strategies for curtailing the spread.

Introduction

Lassa fever is a disease endemic in West Africa caused by the Lassa virus (LASV) [1]. LASV is transmitted through the contamination of foods and other items by the urine and faeces of the infected multi-mammate rat, *Mastomys natalensis* [1,2]. Lassa fever was first discovered in Nigeria in 1969 [3], and there have been thousands of confirmed cases since. In moderate to mild cases, Lassa fever may cause fever, general body weakness, malaise, headache, sore throat, muscle pain, and chest pain [4].

Lassa fever is endemic in Nigeria and cases peak annually during the dry season (December - April) and decrease in May [5]. The incubation period for Lassa fever is between 1 - 3 weeks, which can lead to infection spread from region to region [6]. The rodent host is the primary driver of the Lassa fever seasonal trends, with reproduction cycles of the multimammate rat increasing during the rainy season [7]. Lassa fever is endemic in West African countries such as Nigeria, Liberia. Guinea, Mali, Benin, Togo and Sierra Leone, with Nigeria s the most affected country. Lassa fever cases have also been observed in Germany, Netherlands, Sweden and USA following travel to West Africa. In Nigeria, LASV-endemic areas cover approximately 40% of country [5].

There are seven distinct linages of the LASV recorded, and lineage I, II, and III have been identified in north-eastern, southern and north-central Nigeria [7]. There has not been any other detection of Lineage I since 1969, when the first LF case was reported [7]. Lassa fever cases in Nigeria have increased since 2016, with 633, 833 and 1189 confirmed cases in 2018, 2019 and 2020, respectively (Table 1) [8].

Table 1: Suspected and confirmed cases of Lassa fever in Nigeria, 2016-2022 [2,8]

Year	Suspected cases	Confirmed cases	No. of deaths
2017	733	143	71
2018	3498	633	171
2019	5057	833	174
2020	6791	1189	244
2021	4654	510	102
2022 wk 1-35	6547	909	170

The emergence of the Coronavirus disease (COVID-19) has generated public health concerns in the Nigeria due to the similarities in symptoms, such as fever, cough and shortness of breath [9]. The COVID-19 pandemic has proven difficult to tackle in Nigeria since the initial case on 27 February 2020 [13]. In December 2020, Nigeria entered the second wave of the pandemic, prompting the establishment of an Emergency Operation Centre by the Nigeria Centre for Disease Control (NCDC) to control the rate of spread and limit case fatalities [14, 15].

The number of Lassa fever confirmed cases in Nigeria from 2017 to 2018, 2018 to 2019 and 2019 to 2020 increased by 296, 86 and 451, respectively, during the peak epidemiological period, usually the first 15 weeks of each year (Table 1). In 2021, the confirmed cases markedly decreased by 679, indicating plausible underreporting of Lassa fever owing to COVID-19 [10]. The mild and asymptomatic nature of COVID-19 and Lassa fever [11], coupled with noncompliance with testing, is a significant factor contributing to the underreporting of Lassa fever cases, as people may be hesitant to attend testing sites due to COVID-19. Further misdiagnosis may be seen due to shared clinical features of COVID-19 and Lassa fever, which may be difficult to distinguish in the early stages of disease [12]. This temporal coincidence may have led to increased public health and socioeconomic setbacks owing to Nigeria's limited health care resources for intensive public health interventions [10]. This study describes the current state of Lassa fever in Nigeria amidst the COVID-19 pandemic.

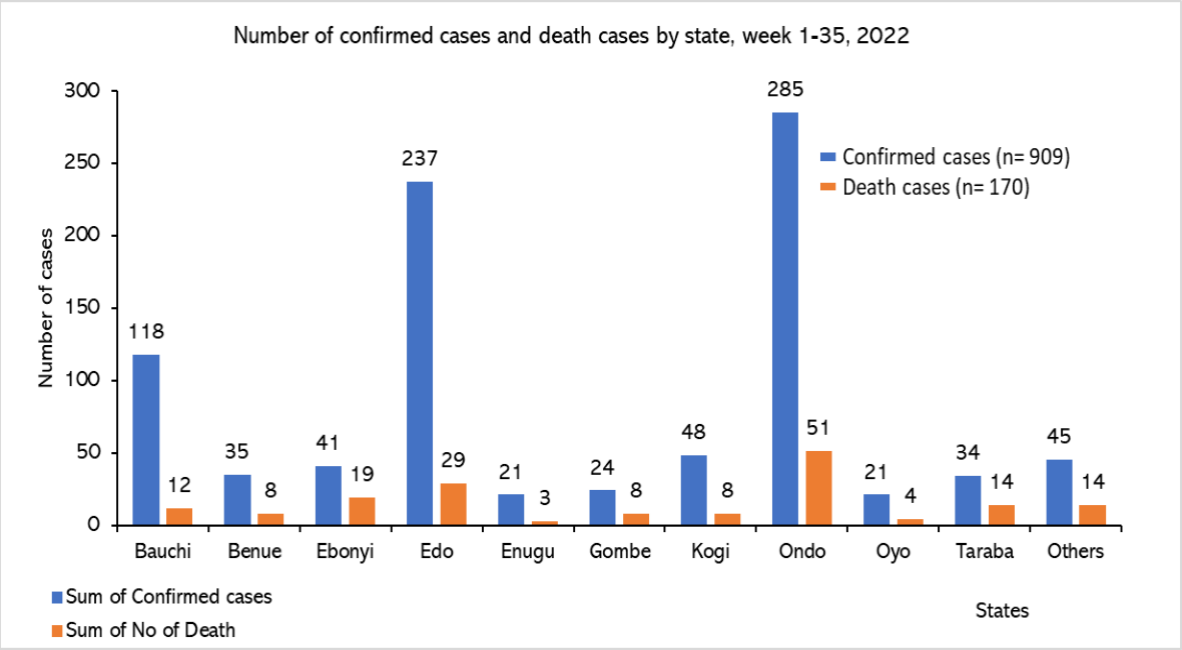
Current Status of Lassa Fever Outbreak Amidst Covid-19 Pandemic in 2022

The NCDC, in January 2020, declared Lassa fever endemic in Nigeria [16]. In response to this, the National Emergency Operation Centre (EOC) was activated in 8 states, including the Federal Capital Territory (FCT). The EOC consisted of an interdisciplinary and multi-partner team to subdue the spreading of the disease [17]. Managing Lassa fever in some of these states has proved difficult due to the simultaneous outbreak of COVID-19 [18]. As Lassa fever peaks in the dry season (December-April), different emergency phases of the virus have been experienced in the country.

Nigeria has recorded a decrease in the number of cases of the LASV since the first quarter of 2020. After a three-month emergency phase (24 January 2020 – 28 April 2020), the Lassa fever outbreak in 2020 was declared over, due to a considerable decrease in the number of confirmed cases [19]. Despite this, the Lassa Fever Technical Working Group has continued coordinating response and surveillance efforts throughout the country [19].

According to the NCDC, in 2020, there were 6791 suspected cases and 1189 confirmed cases, while there were only 4654 suspected cases and 510 confirmed cases in 2021 [8], indicating a large drop in the epidemiological trend in 2021 (Table 1) [8]. Between weeks 1-35, 909 confirmed cases and 170 deaths have been recorded (Figure 1), indicating a spike compared to the same period in 2021 (365 confirmed cases, 83

Figure 1: Number of confirmed cases and deathsin Nigeria by state, (week 1-35), 2022 [8]



deaths) [8]. Between weeks 1-35 in 2022, 70% of all confirmed cases reported were from three states: Ondo (31%), Edo (26%), and Bauchi (13%) States (Figure 1) [8]. The age group affected predominantly is 21-30 years, while the male-to-female ratio is 1:0.8 for confirmed cases [8].

The increase in the epidemiological trend of Lassa fever since the beginning of 2022 has prompted the activation of the National Emergency Operation Centre response to curtail the spread of Lassa fever disease [16]. This has involved the deployment of the National Rapid Response Teams (NRRT), multi-sectoral, multidisciplinary coordination of outbreak response activities in Nigeria [8].

Current Measures and Challenges Facing the Management of Lassa Fever amidst the COVID-19 Pandemic

The disease prevention measures for Lassa fever recommended to the community by the NCDC include: ensuring proper environmental sanitation such as the blockage of holes in the house that could serve as entry points for rats, covering of dustbins, appropriate refuse disposal such as setting up dumpsites at locations far from homes, appropriate storage of foodstuffs such as rice, beans, maize and garri in well-covered containers with tight-fitting lids, avoiding the drying of foodstuffs by spreading them outside on the floor or roadsides where they are exposed to contamination,and avoiding bush burning which could lead to the displacement of rats from bushes to human dwellings. The NCDC also recommended eliminating rats in homes and communities through methods such as setting rat traps, and practising good personal hygiene by washing hands frequently with soap and water or using of hand sanitisers [20].

As of 4 September 2022, the measures that have been put in place to curtail the Lassa virus include: the activation of the EOC response mode level 2 in January 2022 to facilitate an effective multi-sectoral and multidisciplinary coordination of the 2022 Lassa fever outbreak response and subsequent de-escalation in May 2022. Eight molecular laboratories have been set up to ensure that all samples are tested, and results are available within a short period. A Lassa fever preparedness assessment was carried out across the 36 states and FCT, and State Public Health Emergency Operation Centres (PHEOCs) were activated in affected states. The NCDC also deployed National Rapid Response Teams (NRRT) to the FCT, Nasarawa, Edo, Ondo, Bauchi, Ebonyi, Oyo, Taraba, and Benue states [8]. The NRRT, through the PHEOCs, strengthen preparedness and response activities such as outbreak investigation, contact tracing, response coordination, case management, psycho-social care for infected people, risk communication, and infection prevention and control activities [21]. In addition to implementing an environmental response campaign in high-burden states by the Federal Ministry of Environment, risk communication and community engagement activities using the media and Nigeria Lassa fever epidemiological study were also implemented [8]. Lastly, the NCDC uses the One Health approach to strengthen the capacity of states to effectively manage LASV, COVID-19 and other zoonotic diseases [21].

There is currently no vaccine licensed for LASV, despite several vaccine candidates in development [22]. The International AIDS Vaccine Initiative (IAVI)'s LASV vaccine candidate is currently in phase I clinical trial stage for evaluation, and it is expected to undergo phase II trial once the phase I is completed [23].

Despite these measures, similarities in the signs and symptoms of COVID-19 and Lassa fever diseases, leading to potential misdiagnosis, is a great challenge towards curbing Lassa fever in Nigeria during the COVID-19 pandemic. Most Lassa fever cases are asymptomatic, and limited testing capacity leaves patients unaware of their condition, leading to communal transmission [17, 18]. Furthermore, inadequacy in the healthcare system poses a challenge to curbing Lassa fever in Nigeria. With the current doctor-to-patient ratio of 1:5000, a burden is placed on the health system to fight more than one epidemic at a time [17,18].

Recommendations

Nigeria has eight centres for LASV testing across 36 states and Federal Capital Territory (FCT). An increased number of test centres will enhance surveillance and monitoring activities and improve active case detection, thereby limiting the rate of disease spread. As there is currently no licensed LASV vaccine, it is best to continue to intensify the implementation of the LF Environmental response campaign in high-burden states and other areas. Although, the predominant age group reported between weeks 1-35 in 2022 is 21-30 years, all age groups are advised to take the necessary precautions against LASV.

Conclusion

In this work, we described the current situation of Lassa fever in Nigeria in the context of the COVID-19 global pandemic. The recent epidemiological trends indicate that Lassa fever remains a concern. Therefore, it is important to continue surveillance, monitoring, and active testing across all regions to prevent further transmission and health complications. The co-existence of the COVID-19 pandemic has made the Lassa fever situation more difficult to handle. Eliminating these viral infections will necessitate a concerted effort from the government and the general public, the increased uptake of COVID-19 vaccine is vital, and a licensed LASV vaccine is needed soon.

References

1. Duvignaud A, Jaspard M, Etafo IC, et al. Lassa fever outcomes and prognostic factors in Nigeria

(LASCOPE): A prospective cohort study. *The Lancet Global Health*. 2021;9(4). doi:10.1016/s2214-109x(20)30518-0
2. Ogbole ME, Ameh JA, Mailafia S, Olabode OH, Adah BJ. Occurrence of Lassa Fever Virus Infections and Control Efforts in Nigeria. HV [Internet]. 2022 [cited 2022 Sep 16];9(1). Available from: http://researcherslinks.com/current-issues/Occurrence-Lassa-Fever-Virus-Infections-Control-Efforts-Nigeria/6/1/4671/html
3. Ohanu ME, Nwafia IN. Lassa fever: Time to eradicate the deadly disease in Nigeria. Niger J Clin Pract 2019; 22:144-5.
4. World Health Organization. Lassa fever [Internet]. Available from: https://www.who.int/news-room/fact-sheets/detail/lassa-fever [cited 2022 Sep 16].
5. Adeiza M, Chinenye S. Lassa fever in West Africa: A 50-year review. 2019 Dec 15;19:40.
6. Grace JUA, Egoh IJ, Udensi N. Epidemiological trends of Lassa fever in Nigeria from 2015-2021: A review. Therapeutic Advances in Infection. 2021 Jan 1;8:20499361211058252.
7. Arruda LB, Haider N, Olayemi A, Simons D, Ehichioya D, Yinka-Ogunleye A, et al. The niche of One Health approaches in Lassa fever surveillance and control. Ann Clin Microbiol Antimicrob. 2021 Apr 24;20:29.
8. Nigeria Centre for Disease Control (NCDC). Lassa fever situation report. 2018-2022. [Internet]. [cited 2022 Sep 16]. Available from: https://ncdc.gov.ng/diseases/sitreps/?cat=14&name=An%20update%20of%20COVID-19%20outbreak%20in%20Nigeria
9. Eranga IO. COVID-19 Pandemic in Nigeria: Palliative Measures and the Politics of Vulnerability. *Int J MCH AIDS*. 2020;9(2):220-222. doi:10.21106/ijma.394
10. Musa SS, Zhao S, Abdullahi ZU, Habib AG, He D. COVID-19 and Lassa fever in Nigeria: A deadly alliance? International Journal of Infectious Diseases. 2022 1 April; 117:45-7.
11. World Health Organization Regional Office for Africa. Lassa fever. 2021. [Internet]. [cited 2022 Sep 16]. Available from: https://www.afro.who.int/health-topics/lassa-fever
12. Sherrard-Smith E, Hogan AB, Hamlet A, Watson OJ, Whittaker C, Winskill P, et al. The potential public health consequences of COVID-19 on malaria in Africa. Nat Med 2020;26(9):1411–16.
13. NCDC. First Case of Coronavirus Disease Confirmed in Nigeria. 2020. [Internet]. [cited 2022 Sep 16]. Available from: https://ncdc.gov.ng/news/227/first-case-of-corona-virus-disease-confirmed-in-nigeria
14. Nigeria hit by second wave of COVID-19. 2020. [Internet]. [cited 2022 Sep 16]. Available from: https://www.aa.com.tr/en/africa/nigeria-hit-by-second-wave-of-covid-19/2080881
15. Okereke M, Fortune E, Peter AO, Ukor NA, Lucero-Prisno III DE. Second wave of COVID-19 in Nigeria: lessons from the first wave. Int J Health Plann Mgmt. 2022;37(2):650-656. https://doi.org/10.1002/hpm.3396
16. Reliefweb, Nigeria: Lassa Fever- Emergency Plan of Action Final Report, DREF Operation no MDRNG029. [Internet]. [cited 2022 Sep 16]. Available from: https://reliefweb.int/report/nigeria/nigeria-lassa-fever-emergency-plan-action-final-report-dref-operation-n-mdrng029
17. Wong K, Ullah I, Taseer AR, Irfan M, Almas T, Musa SS. Dual tension: Lassa fever and COVID-19 in Nigeria. Ethics, Medicine and Public Health. 2021 Sep 1; 18:100697.
18. Reuben RC, Gyar SD, Makut MD, Adoga MP. Co-epidemics: have measures against COVID-19 helped to reduce Lassa fever cases in Nigeria? New Microbes and New Infections. 2021 Mar 1; 40:100851.
19. Nigeria Centre for Disease Control. End of emergency phase of 2020 Lassa fever outbreak [Internet]. [cited 2022 Sep 16]. Available from: https://ncdc.gov.ng/news/249/28th-april-2020-%E2%80%93-nigeria-centre-for-disease-control-announces-end-of-emergency-phase-of-2020-lassa-fever-outbreak
20. Fischer RJ, Purushotham JN, van Doremalen N, Sebastian S, Meade-White K, Cordova K, et al. ChAdOx1-vectored Lassa fever vaccine elicits a robust cellular and humoral immune response and protects guinea pigs against lethal Lassa virus challenge. npj Vaccines. 2021 Mar 2;6(1):1–11.
21. Nigeria Centre for Disease Control (NCDC). Lassa Fever Public Health Advisory. 28 January 2021. [Internet]. [cited 2022 Nov 20]. Available from: https://ncdc.gov.ng/news/294/lassa-fever-public-health-advisory
22. First vaccinations in Phase I clinical trial of Lassa fever vaccine [Internet]. IAVI. [cited 2022 Sep 16]. Available from: https://www.iavi.org/news-resources/press-releases/2022/iavi-announces-first-vaccinations-at-liberia-site-in-phase-i-clinical-trial-of-lassa-fever-vaccine-candidate
23. Nigeria Centre for Disease Control (NCDC). NCDC Activates EOC for Lassa Fever Response Following Outbreaks of Cases in Nigeria. 26 January 2022. [Internet]. [cited 2022 Sep 16]. Available from: https://ncdc.gov.ng/news/357/ncdc-activates-eoc-for-lassa-fever-response-following-outbreaks-of-cases-in-nigeria

How to cite this article: Omojuyigbe, JO, Oladipo, HJ, Adegbite, MA et al. **Current Trends of Endemic Lassa fever amidst COVID-19 in Nigeria**. Global Biosecurity. 2023; 5(1).

Published: February 2023

Global Biosecurity is a peer-reviewed open access journal published by University of New South Wales.