



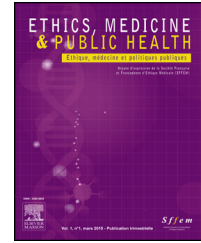
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LETTER TO THE EDITOR

Dual tension: Lassa fever and COVID-19 in Nigeria



Keywords COVID-19; Lassa fever; Nigeria; Outbreak

Dear Editor,

Lassa fever is a viral hemorrhagic, zoonotic disease that is a continuous health issue in West African countries such as Sierra Leone, Liberia, Guinea and Nigeria [1]. Ingestion and inhalation are the most common ways of transmission of Lassa fever. Patients generally get infected due to an exposure to food or household items which are contaminated with urine or droppings of infected Mastomys rodents. Lassa fever was first discovered in Lassa town, Borno State in Nigeria. It causes around 1,000,000–300,000 infections each year with approximately 5000 deaths in Nigeria [1]. In 2020, 70 deaths have been reported in 26 Nigerian states and the Federal Capital Territory. Among all those cases, 75% were from Edo, Ondo, and Ebonyi [2]. As of May 2020, Nigeria has recorded 991 confirmed cases and 191 deaths with case fatality ratio of 19.3% [3]. To prevent and mitigate the negative impact of Lassa Fever, the Nigeria Center for Disease Control (NCDC) has formed an interdisciplinary, multi-partner technical team to control outbreaks in affected Nigerian states.

With the newly formed team, confirmed cases of Lassa fever in the first 15 weeks of 2021 decreased as compared to the same period in 2020. According to NCDC, there were 4386 suspected cases and 973 confirmed case in 27 Nigerian states from week 1–15 in 2020, while there were only 1592 suspected cases and 247 confirmed cases in 14 Nigerian states from week 1–15 in 2021 [4]. This indicates a 4-fold decrease in confirmed Lassa fever cases. In week 15, there were only 6 confirmed cases in 2 states (Edo and Benue) [4]. Deaths due to Lassa fever also decreased from 188 to 50 when compared to the same period in 2020 (week 1–15). Based on the demographic of the report, the age group that is most affected is 21–30 years old. Also, gender isn't a risk factor [4].

While Lassa fever continues to be a public health challenge in Nigeria, Nigerians are also facing the COVID-19 pandemic. Nigeria recorded the first case on February 27, 2020 and a multi-sectorial national Emergency Operation Center (EOC) was activated to oversee the nation's response to COVID-19 [5]. They initially faced difficulties in country lockdown as it affected people's livelihood, especially those who are daily income earners, and in turn caused lockdown-induced poverty and unemployment [5]. As of April 23, 2021,

Nigeria has 164, 756 confirmed cases and 2062 deaths [6]. A new COVID-19 variant was also detected in December 2020 which lead to a second wave of infections. While Lassa fever is generally asymptomatic, severe cases require hospitalization [3]. Since COVID-19 and Lassa fever share the same clinical and laboratory facilities, management of Lassa fever becomes more difficult during the pandemic.

In fact, there are a lot of untested cases in Nigeria since there are only five modulator laboratories for Lassa fever testing and they are all located in either southern or central parts of the country [7]. This makes transportation a challenge during the pandemic. A lack of physicians is another main challenge. With 40,000 doctors in the whole country, which gives a doctor-to-patient ratio of 4:1 [7], the health system is not strong enough to face the two epidemics at the same time. Similar symptoms such as fever and headache in COVID-19 and Lassa fever, as well as other common tropical illnesses, complicates diagnosis which delays initiation of therapy [8] as patients may try self-medicating before seeking medical attention.

While there is no evidence that COVID-19 increases the risk of getting Lassa fever, there are reports of dengue-endemic countries with increased COVID- dengue co-infections in countries such as Bangladesh, Columbia, and Ecuador [8]. To better control Lassa fever outbreaks during COVID-19 in Nigeria, community engagement and disease preparedness are required. There is currently no preventive medication or vaccines against Lassa fever; however, non-pharmacological interventions may help decrease risk. Specifically, health education in the community is important. One possible strategy is to educate people about hygiene practices which include washing hands with soap and water, or alcohol sanitizer. Another potential strategy is to store food in rodent-proof containers and dispose garbage in proper place [9]. In regard to diagnostic testing, a combination of clinical presentation with serological and molecular assays is recommended for more accurate diagnosis and therapeutic decision-making [10]. In preventing infectious disease, availability and accessibility, as well as proper use of personal protective equipment plays a crucial role [11]. In general, a stronger health system is require for health emergency preparedness. Study showed that strong public health is a potential first line of defense and the foundation of the health system. For example, countries should strengthen the core capacities regardless of resources. Reviewing the public health law frame, supporting evidence-based practice, and strengthening public health infrastructure and capabilities are other strategies [12]. A community program to control rat population will

also be helpful. For example, blockage of holes around houses, removal suspected sources that attract rats, and use of rodenticides [13].

Overall, Nigeria continues to face COVID-19 and Lassa fever epidemic. While the numbers of confirmed cases have decreased, further actions and plans are needed to control and mitigate their negative impacts in Nigerians. This requires citizens, healthcare workers, and government to collaborate together to ensure best practices in community and in hospital. A strong health system is also crucial in public health emergency preparedness and managing future epidemics.

Human and animal rights

The authors declare that the work described has not involved experimentation on humans or animals.

Informed consent and patient details

The authors declare that the work described does not involve patients or volunteers.

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Author contribution

K.W and I.U conceived the idea, K.W, A.R.T, M.I and T.A retrieved the data, did write up of letter and finally I.U and S.S.M reviewed and provided inputs. All authors approved the final version of manuscript.

Disclosure of interest

The authors declare that they have no competing interest.

References

- [1] Ogbu O, Ajuluchukwu E, Uneke C. Lassa fever in West Africa sub-region: an overview. *J Vector Borne Dis* 2007;44:1–11.
- [2] World Health Organization. Emergencies preparedness, response: Lassa Fever- Nigeria; 2020.
- [3] Reuben RC, Danladi MMA, Pennap GR. Is the COVID-19 pandemic masking the deadlier Lassa fever epidemic in Nigeria? *J Clin Virol* 2020;128:104434, <http://dx.doi.org/10.1016/j.jcv.2020.104434>.
- [4] Nigeria Center for Disease Control. Lassa fever situation report; 2021.
- [5] Amzat J, Aminu K, Kolo VI, Akinyele AA, Ogundairo JA, Danjibo MC. Coronavirus outbreak in Nigeria: Burden

and socio-medical response during the first 100 days. *Int J Infect Dis* 2020;98:218–24, <http://dx.doi.org/10.1016/j.ijid.2020.06.067>.

- [6] World Health Organization. Global: Nigeria; 2021.
- [7] Obaji P. In Nigeria, families battle coronavirus and the more deadly Lassa fever. *TRT world*; 2021 [Accessed April 26, 2021]. <https://www.trtworld.com/magazine/in-nigeria-families-battle-coronavirus-and-the-more-deadly-lassa-fever-35651>.
- [8] 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 New Infect* 2021;40:100851, <http://dx.doi.org/10.1016/j.nmni.2021.100851>.
- [9] International Association for Medical Assistance to Travellers. Nigeria for specific travellers: Nigeria; 2020.
- [10] Raabe V, Koehler J. Laboratory diagnosis of Lassa fever. *J Clin Microbiol* 2017;55:1629–37, <http://dx.doi.org/10.1128/JCM.00170-17>.
- [11] Umar SS, Muhammad BO, Zaharadeen SB. Preparedness of Nigerian health institutions toward managing Lassa fever epidemic and COVID-19 pandemic. *Niger J Med* 2020;29:303–7.
- [12] Commission on a global health risk framework for the future, National Academy of Medicine Secretariat. The neglected dimension of global security: a framework to counter infectious disease crises. Washington (DC): National Academies Press (US); 2016 [3, Strengthening Public Health as the Foundation of the Health System and First Line of Defense. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK368392/>].
- [13] Justina K. The spread of coronavirus in Lassa fever endemic areas; challenges facing health educators: a review. *IOSR J Nurs Health Sci* 2020;9:11–5.

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