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Short Communication

## COVID-19 and Lassa fever in Nigeria: A deadly alliance?

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## ABSTRACT

As the COVID-19 pandemic poses serious threats to global public health, Nigeria faces a potential public health crisis owing to COVID-19 and other infectious diseases, such as Lassa fever (LF) and malaria. In this study, we discuss the possible determinants behind the decreased number of LF cases in Nigeria, which was likely due to the synergistic impact of the COVID-19 pandemic. During the COVID-19 pandemic, the epidemic curve of LF seems to have deviated from the general seasonal scale seen in past years, which could be due to underreporting of cases. In addition, partial compliance with nonpharmaceutical interventions, limited resources, or human behavior could be contributing factors. Thus, we suggest that better differentiation in terms of human and resource allocation between COVID-19 and LF could help curtail the transmission effectively.

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COVID-19 has become one of the most dangerous pandemics to cause severe problems for humanity in the past decades. SARS-CoV-2, a virus that causes COVID-19, emanated from China in December 2019, when public health officials alerted the World Health Organization (WHO) about pneumonia of an unknown etiology (WHO, 2021; Li et al., 2020). Subsequently, the disease rapidly spread worldwide. Nigeria faces a potential public health crisis owing to the synergistic epidemic of COVID-19 and other infectious diseases (Sherrard-Smith et al., 2020; Bouba et al., 2021). A synergistic or syndemic epidemic refers to a concurrent or sequential epidemic causing an excess burden of 2 or more diseases with biological interactions (<https://en.wikipedia.org/wiki/Syndemic>).

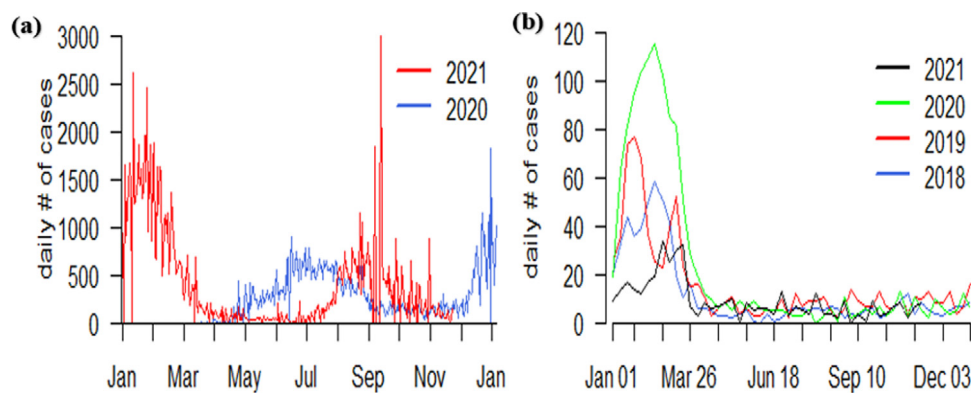
COVID-19 morbidity and mortality rates have rapidly increased in Nigeria since early 2020 (Figure 1a) (NCDC, 2021). Concurrently, the country has witnessed a series of Lassa fever (LF) outbreaks, a deadly zoonotic disease transmitted by rodents (NCDC, 2021). The LF spread has consistently been increasing since 2018 (Figure 1b)

(NCDC, 2021). By November 14, 2021, only 418 cumulative LF cases (with 79 fatalities) were recorded nationwide throughout the year; however, there were 1136 cumulative cases and 234 deaths recorded during the same period in 2020 (NCDC, 2021). The time-series analysis for COVID-19 and LF was conducted using the R statistical software (version 4.0.3; The R Foundation for Statistical Computing, Vienna, Austria). The data were obtained from the WHO COVID-19 dashboard and the Nigeria Centre for Disease Control (NCDC) diseases situation report, which is based on laboratory confirmation following the case definition (WHO 2021; NCDC, 2021).

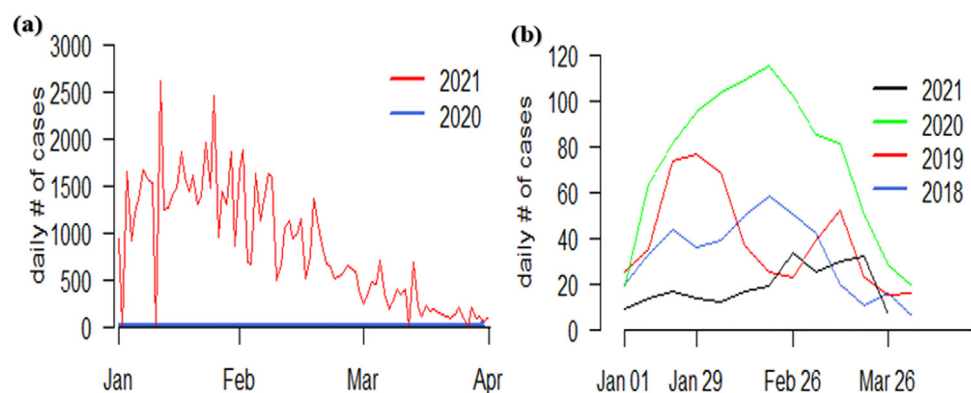
The decrease in LF cases during the pandemic was plausibly owing to the syndemic impact and underreporting issues, as observed in other diseases such as malaria (Sherrard-Smith et al., 2020). In particular, the LF morbidity and mortality cases significantly decreased during the first 3 months of 2021, compared with the same period in previous years. During the LF epidemiological peak period (i.e., roughly the first 15 weeks of each year), we observed an increase in LF cases by +296 from 2017 to 2018, by +86 from 2018 to 2019, and by +451 from 2019 to 2020. However, a notable decrease of −727 was observed from 2020 to 2021 (Figure 2a and b), indicating plausible underreporting of LF in 2021

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**Figure 1.** Time-series plots of COVID-19 and LF in Nigeria. Figure (a) represents the COVID-19 situation reports for 2020 and 2021. Figure (b) represents the LF situation reports for 2018 to 2021. Data were obtained from WHO (2021) and NCDC (2021). COVID-19 = coronavirus disease 2019; LF = Lassa fever; NCDC = Nigeria Centre for Disease Control; WHO = World Health Organization.



**Figure 2.** Time-series plots of COVID-19 and LF in Nigeria for January-March. Figure (a) represents the COVID-19 situation reports for the first 3 months of 2020 and 2021. Figure (b) represents the LF situation reports for the first 3 months in each of 2018 to 2021. Data were obtained from WHO (2021) and NCDC (2021). COVID-19 = coronavirus disease 2019; LF = Lassa fever; WHO = World Health Organization; NCDC = Nigeria Centre for Disease Control.

owing to COVID-19. In addition, owing to the mild and asymptomatic nature of COVID-19 and LF, which could reach up to 80% (Musa et al., 2020; WHO Africa, 2021), coupled with noncompliance with nonpharmaceutical interventions, the LF cases are likely to be underreported, especially during the pandemic when people are afraid of showing up for tests owing to the fear of COVID-19. Consequently, the LF cases are often observed to rise at the beginning of each year and attain a peak between January and March (Zhao et al., 2020). The peak of the COVID-19 pandemic occurred during the same period in 2021 (Figure 1a) when respiratory diseases are most commonly found. This temporal coincidence might cause even more devastating public health and socioeconomic setbacks, which require intensive public health intervention.

COVID-19 and LF are difficult to distinguish (especially at the early stage) because they share some clinical features (Sherrard-Smith et al., 2020). Furthermore, co-infections with arboviruses have not been well studied in Africa. Amid this complex epidemiological scenario, Nigeria's resource-limited health care system faces the risk of being overwhelmed with multiple socioeconomic crises. Limited medical/health care resources (such as intensive care units, real-time reverse transcription polymerase chain reaction) further make it difficult to respond to emergencies or detect virus importation early to prevent onward transmission (Ohia et al., 2020). Another concern lies in the costs of hospitalization owing to LF.

Moreover, the pandemic has significantly affected malaria transmission (Sherrard-Smith et al., 2020) given that malaria also shares many clinical symptoms with COVID-19. Before the outbreak of

COVID-19, malaria control had been successful because of the effective allocation of long-lasting insecticidal nets (LLINs) and other control measures. However, it is now challenging to distribute LLINs because of the impact of the pandemic. In addition, the public is afraid of reporting malaria symptoms owing to the fear of COVID-19, which likely increases morbidity and mortality cases (Sherrard-Smith et al., 2020).

COVID-19 by itself has great potential to engulf a health care system, and the situation can worsen when accompanied by an LF outbreak. Nigerian authorities are making every possible effort to suppress/mitigate the pandemic while paying attention to other diseases of public health significance. Previous studies revealed the plausibility of COVID-19 underreporting accelerating disease transmission (Musa et al., 2021; Li et al., 2020). Furthermore, it is imperative to investigate LF cases that are likely underreported during the pandemic.

Although LF has a high mortality rate (especially in pregnancy), early treatment of symptoms by ribavirin and rehydration enhances survival (WHO Africa, 2021). There is currently no licensed vaccine against LF. However, there are a few candidate vaccines in development, which, when ready, are expected to provide protection against LF infection and help prevent neurological complications and deafness caused by LF. Nevertheless, the availability of several COVID-19 vaccines against the infection helps in reducing morbidity and mortality cases. Therefore, substantial improvement in research and medical resources is required for achieving effective disease control. This could help increase the reporting rate and, in turn, suppress COVID-19 and LF outbreaks in Nigeria.

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## Authors' contributions

All authors contributed equally.

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Ethics approval was not needed because all the data used in this work can be obtained in the public domain.

## Consent to publish

Not applicable.

## Availability of data and materials

All the data used can be obtained in the public domain.

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