Highlights
- The alliance of COVID-19 and Lassa fever has lingered public health concerns
- We investigated the synergetic impact of COVID-19 on Lassa fever in Nigeria
- We explored possible reasons for decreased Lassa fever cases during the pandemic
- We observed potential under-reporting of Lassa fever cases due to SARS-CoV-2
COVID-19 and Lassa fever in Nigeria: A deadly alliance?

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Abstract

As COVID-19 pandemic poses serious threats to public health globally, Nigeria faces a potential public health crisis due to the 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 synergetic impact of the COVID-19 pandemic. The LF’s epidemic curve during the COVID-19 pandemic appeared deviant from the general seasonal scale in past years and was suspected due to under-reporting of cases. This is then argued as a consequence of partial compliance with nonpharmaceutical interventions (NPIs), limited resources, or human behaviour. Thus, we suggest better differentiation in human- and resource-allocation for COVID-19 vs LF could help curtail the transmission effectively.

Main Text

COVID-19 has become one of the most dangerous pandemics that deployed severe problems to humanity in the past decades. SARS-CoV-2, a virus that caused COVID-19, emanated from China in December 2019, when public health officials alerted WHO about pneumonia of unknown etiology (WHO, 2021; Li et al., 2020). Subsequently, the disease spreads rapidly to worldwide. Nigeria faces a potential public health crisis due to the synergistic epidemic of the COVID-19 and other infectious diseases (Sherrard-Smith et al., 2021; Bouba et al., 2021). A synergistic or syndemic epidemic refers to a concurrent or sequential epidemic causing an excess burden of two 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 (see Figure 1 (a)) (NCDC, 2021). Concurrently, the country suffers from a series of LF outbreaks, a deadly zoonotic disease transmitted by rodents (NCDC, 2021). The LF spread has consistently been increasing since 2018 (see Figure 1 (b)) (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 LHF was conducted using the R statistical software of version 4.0.3. The data were obtained from the WHO COVID-19 dashboard and the NCDC diseases situation report, which are based on laboratory confirmation following the case definition (WHO 2021; NCDC, 2021).

The decrease in LF cases during the pandemic was plausibly due to the syndemic impact and under-reporting issues, as observed in other diseases like malaria (Sherrard-Smith et al., 2021). In particular, the LF morbidity and mortality cases significantly decreased during the first
three months of 2021, compared to the same period in previous years. During the LF epidemiological peak period (i.e., 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 (See Figure 2 (a) & (b)), indicating plausible under-reporting of LF in 2021 due to COVID-19. In addition, due to the mild and asymptomatic feature of COVID-19 and LF, which could reach up to 80% (Musa et al., 2020; WHO Africa, 2021), coupled with non-compliance of NPIs, the LF cases are likely to be under-reported, especially during the pandemic when people are afraid of showing up for tests due 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). And the peak of the COVID-19 occurred during the same period in 2021 (see Figure 1a), when respiratory diseases are most commonly found. This temporal coincidence might cause even more devastating public health and socio-economic setbacks, which requires intensive public health intervention.

COVID-19 and LF are difficult to distinguish (especially at the early stage) since they share some clinical features (Sherrard-Smith et al., 2021). Besides, co-infections with arboviruses has not been well studied in Africa. Amid this complex epidemiological scenario, Nigeria's limited resources healthcare system faces the risk of being overwhelmed and multiple socio-economic crises. Limited medical/healthcare resources (such as intensive care units, real-time RT-PCR, etc.) would make it challenging for emergencies or perform early detection of virus importation to stop onward transmission (Ohia et al., 2020). Another concern lies in the costs of hospitalization due to LF.
Moreover, the pandemic has significantly impacted malaria transmission (Sherrard-Smith et al., 2021), as malaria also share many clinical symptoms with COVID-19. Malaria control has been fruitful before the arrival of COVID-19 due to the effective allocation of long-lasting insecticidal nets (LLINs) and other control measures. However, it is now challenging to distribute LLINs due to the pandemic impact. Also, the public is afraid of reporting malaria symptoms due to the fear of COVID-19, which likely increases the morbidity and mortality cases (Sherrard-Smith et al., 2021).

COVID-19 alone 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 effort to suppress/mitigate the pandemic while paying attention to other diseases of public health significance. Previous studies revealed the plausibility of COVID-19 under-reporting, accelerating disease transmission (Musa et al., 2021; Li et al., 2020). Besides, it is imperative to investigate LF cases that are likely under-reported during the pandemic.

Although the 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 licenced vaccine for use against LF. However, there are few candidate vaccines in development, which, when ready, are expected to provide protection against LF infection and help prevent neurological complications and deafness caused due to LF. Nevertheless, COVID-19 has several vaccines against the infection, which helps in reducing morbidity and mortality cases. Therefore, controlling the diseases effectively requires substantial research and medical resources improvements. These could help increase reporting rate and, in turn, suppress COVID-19 and LF outbreaks in Nigeria.
Declarations

Ethics approval and consent to participate

Ethics approval was not needed since 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.

Competing interests

The authors declared that they have no competing interests.

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References


Figure Legend

Figure 1. Time series plots of COVID-19 and LF. The right panel (a) represents the COVID-19 situation reports in Nigeria for 2020 and 21. The left panel (b) represents the LF situation reports in Nigeria for 2018 to 2021. Data were obtained from (WHO, 2021; NCDC, 2021).

Figure 2. Time series plots of COVID-19 and LF during January-March. The right panel (a) represents the COVID-19 situation reports in Nigeria for the first three months of 2020 and 2021. The left panel (b) represents the LF situation reports in Nigeria for the first three months for 2018 to 2021. Data were obtained from (WHO, 2021; NCDC, 2021).
Competing interests

All authors declared that they have no competing interests.