

Dengue and Coronavirus disease (COVID-19) syndemic: Double threat to an overburdened healthcare system in Africa

Abstract

Dengue fever (DF) is a significant public health problem in the African continent. The primary prevention strategy against the disease is vaccination and entomological control of vectors; however, implementing such a strategy in several countries in the continent is far below what is necessary to control the disease. The Coronavirus disease (COVID-19) pandemic further aggravated this situation and negatively impacted these measures, mainly the coverage of vaccination campaigns, due to restrictive measures to control the disease. Therefore, the most significant risk is that the incidence of DF in the continent will increase even more in the coming years, as a reflection of the negative impact of the pandemic on the control of the disease. To prevent another public health crisis, immediate and multidisciplinary approaches are required to address the epidemiological control of DF in African countries.

KEYWORDS

COVID-19, dengue fever, dengue transmission, syndemic, vector control

To the Editor,

Dengue fever (DF) is an acute febrile arboviral infection with a significant disease burden in the tropics and subtropical regions of the world. The dengue virus (DENV) is transmitted mainly by female mosquitoes of the *Aedes aegypti* species. It has a long history of epidemics in Africa since the 19th century, affecting Tanzania, Egypt, Burkina Faso, South Africa, and Senegal initially, and after 1960, involving most countries of Eastern Africa. Currently, the virus is endemic to 34 African countries.^{1,2} In 2021, there have been 13,482 new cases of DENV in the African continent, affecting Kenya and Reunion in particular. These form just a minuscule portion of the estimated 390 million infections per year—that has put up to 3.9 billion people at risk—making it the most frequent arboviral infection globally.^{1,3} The article discusses the endemic situation of the DENV amidst the Coronavirus disease (COVID-19) pandemic in Africa, challenges, efforts, and recommendable actions.

The DENV has four serotypes (DENV 1-4) and presents itself as a flu-like illness whose symptoms last up to a week after being incubated for up to 10 days. It can be severe or straightforward and causes headaches, muscles aches, joint pains, nausea, vomiting, and rash.² Many of these clinical manifestations are like the COVID-19, which was first identified in 2019 and has caused a pandemic in 2020–2021. To this date, COVID-19 has 3,527,876 cases in 47 African countries resulting in 88,022 deaths, with the most affected countries in Africa being South Africa, Morocco, Tunisia, Ethiopia, and Egypt.⁴ The typical coronavirus symptoms are fever, dry cough, and extensive tiredness; however, patients have reported aches and pains, diarrhoea and conjunctivitis, headache, anosmia, and ageusia as well as

rashes. The current evidence also suggests that the virus is transmitted from person to person through respiratory droplets or aerosols, particularly when people cough, sneeze, speak and breathe.^{2,4}

DF and COVID-19 have common clinical manifestations; hence, they can easily exist as co-infection. Without proper diagnosis and surveillance, the threat of underdiagnosis looms will hint towards a more complex situation regarding the true epidemiological extent of arboviruses than the available evidence. Furthermore, DF becomes undermined as global efforts are now centred on COVID-19 clearance, and the increased incidence and mortality due to dengue will rise because of low testing and inadequate surveillance.⁵

COVID-19 potentiates the spread of many diseases such as zika, yellow fever, measles, mucormycosis, Lassa fever, HIV, as seen in many countries.⁶⁻¹³ The COVID-19 induced lockdowns have also exacerbated DF cases, thus creating a syndemic. Indeed, COVID-19 and DF are two interacting epidemics.⁵ The restrictions due to the COVID-19 pandemic led to the interruption of the vector control programs that contribute to the control of mosquitoes. Amongst these, there are indoor residual spraying and effective environmental spraying, which prevent further domination of mosquitoes' thus controlling the DENV.¹⁴ Over time, lockdown-related disruption is also likely to lead to more abundant mosquito populations, as the existing breeding habitat treatments degrade and new breeding habitats are not wiped out.¹⁵

The lack of scientific prudence among those that advise the politicians and other stakeholders in Africa has a significant reflection on how the outbreak is managed; submitting to the stakeholders without clarifying the reality of the epidemic complicate the state of things while Africa is stuck without quality disease surveillance.^{19,21}

Furthermore, lockdowns are likely to influence the contact rate between human and mosquito populations due to close contacts and proximity between people during restrictions. There might be a detectable decrease in dengue transmission in areas where the mosquito populations usually thrive outside the home, like public spaces, places of work, or schools. These reductions are likely to be even more pronounced in areas where the importation of the DENV through the movement of people locally from an endemic region to a non-endemic region.¹⁶ Conversely, in the setting of a town, residential areas serve as eminently favourable breeding sites. Hence, the good can congregate in and around the home. This, coupled with the increased availability of blood meals (the humans), lead to a substantial increment in exposure to mosquito bites and DENV contraction amongst people.¹⁵

Moreover, lockdowns are also likely to disrupt the detection and reporting of dengue cases by routine surveillance systems. Lockdowns could reduce the proportion of dengue infections reported (underreporting). This hampers the timeliness and accuracy of minimised dengue data, particularly for non-severe cases. COVID-19 epidemics substantially reduce seeking treatments for DF.¹⁷

Until the full extent of these issues is known, it is crucial to maintain and strengthen existing dengue control practices, particularly during the lockdown. During stay-at-home orders, community participation in mosquito control activities should be supported, including intradomicile-supported targeted indoor residual spraying, reduction in domicile water containers, and appropriate coverage of water storage tanks. Removing artificial containers that remove synthetic and personal protective measures such as impregnated clothing and using repellents during the day will also be helpful.¹⁸ Public health messaging and community engagement in tropical and subtropical countries should address both COVID-19 and dengue.

There is a need for adequate sensitisation, awareness, and other public health programs to enhance the public health response during the outbreak; this could be done through traditional mass media such as radio, newspapers, television, billboards, etc. There is a need to use the social press and other modern technologies for information dissemination to combat false news. There is a need to increase health knowledge through the voice of medical professionals, mainly in high-risk areas. There is especially a need for the national and international governments to improve the disease surveillance system around African countries for easy contact and tracing.¹⁹ The healthcare system needs to educate the public about the impedance of sanitation to avoid the development of mosquitoes around. The public needs to take action to keep themselves neat and clean as possible.

Conclusively, as the African continent struggles with the burden of the COVID-19 pandemic,¹⁹ high-risk regions with endemic DF are facing the prospect of a dual pandemic that could overwhelm the healthcare services in Africa. The state of the African healthcare system is fragile, and responding to two concurrent outbreaks can be complicated,

mainly if there is no intervention and aid from other health institutions.²⁰ Therefore, the current epidemiological situation of dengue in Africa must be addressed with multidisciplinary health responses involving several stakeholders from the government to health agencies and even individuals. These responses should focus on public health strategies for prevention, epidemiological surveillance, early and more reliable testing/diagnosis, training of health professionals, and educational initiatives for the population. Overall, reflecting on these suggestions, it will be possible to lighten the burden of both epidemics in Africa.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interests.

ETHICS STATEMENT

The present study includes printed and published information; therefore, the formal ethical clearance was not applicable for this study.

AUTHOR CONTRIBUTIONS

All authors have substantially contributed in this research.

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DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analysed in this study.

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