Tropical Doctor
2022, Vol. 52(1) 6–8

DOI: 10.1177/00494755211055247
journals.sagepub.com/home/tdo
SAGE

# The concomitant viral epidemics of Rift Valley fever and COVID-19: A lethal combination for Kenya

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**Keywords**
Kenya, Rift Valley Fever, COVID-19, Public Health

## Dear Sir

In June 1912, a government farm in Rift Valley Province in Kenya alerted the health authorities with reports of a highly lethal disease of lambs.[1] Over 100 years later, and multiple outbreaks with devastating socio-economic losses, the causative agent, now known as Rift Valley Fever Virus (RVFV), is still deemed a priority pathogen by the World Health Organization (WHO) owing to its "epidemic potential."[1,2]

The mosquito-borne phlebovirus, RVFV is a threat to both humans and livestock, often disproportionately targeting pastoral communities. Animals, mainly sheep and goats, are infected through bites of infected mosquitoes, while the disease is primarily transferred to humans upon direct contact with contaminated animal fluids, tissues, and products, and rarely through infected mosquito bites.[3] Although the clinical course in humans usually takes the form of a mild flu-like illness, severe symptoms such as haemorrhagic fever, or ocular and neurological manifestations may develop in 1–2% of cases.[1,4]

Among the countries with the highest prevalence of RVF epizootics, Kenya is plagued by recurrent outbreaks with livestock in 36 of its 47 counties harbouring the pathogen.[2] The 2006–2007 RVF outbreak was particularly catastrophic for the nation, resulting in 684 cases, 234 deaths, and a hefty economic loss of over US$32 million.[3,5] The current RVF outbreak in Kenya began in November 2020, with 32 cases and 11 deaths reported as of 4 February 2021, with human cases being detected in Isiolo and Mandera counties.[6]

All Kenyan RVF epizootics have been instigated by periods of heavy rainfall and consequent flooding, which facilitate excellent breeding conditions for mosquito vectors. The ecosystem in Kenya is further sensitized to RVF owing to increasing livestock trade and migration, high density of livestock and vector populations, and a level terrain which is conducive to water-retaining soils.[1–3] Kenya faces several public health challenges, including understaffing, poor funding, and lack of specialized medical equipment and personnel to meet the needs of, with 65% of its population who reside in rural areas.[7] Furthermore, a recent analysis described a dire shortcoming in the Kenyan health infrastructure in terms of its hospital surge capacity.[8]

Thus, with a concomitant viral epidemic of COVID-19, the Kenyan response to the current RVF outbreak is proving insufficient. As in several countries, the most significant deficiency is the absence of efficient vector control measures.[6]

The first case of COVID-19 in Kenya was registered on March 12th, 2020. Since then, Kenya's overburdened, and understaffed medical facilities have been urgently drafted to tackle the pandemic. By September, 2021, Kenya registered over 200,000 confirmed cases and 4757 deaths, but had administered over 2.75 million vaccine doses but still

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only fully vaccinating 1.5% of the country's population.[9] Resources previously used to combat recurrent zoonosis outbreaks in the region, have been diverted towards COVID-19 management. Additionally, surveillance officers have transferred to monitoring COVID-19; the enormous demand for analysis of COVID-19 samples has hindered the processing of samples of other pathogens. This has thus led to widespread lack of resources to monitor, prevent, and treat RVF.[6]

The risk of the current RVF outbreak transforming into an epidemic is further increased by the greater movement of people to rural areas in search of animal products such as meat and milk - since the government embargo in towns and commerce with abroad.[10] Presently, there are no definitive treatment available for RVF and even in severe cases, the management is supportive. However, live attenuated and inactivated vaccines against RVF are used in endemic regions. The immune response from inactivated vaccines is not strong and often requires repeat booster doses to maintain immunity, whereas a single dose of attenuated vaccine provides sufficient protection.[11,12] No licensed vaccines are available for human use.

Currently, WHO is collaborating with local bodies to determine the scope of the outbreak, its associated risk factors, vector surveillance and ecology mapping, details of which are being included in the weekly outbreak Situation Report.[13] Considerable preventative efforts have been established including animal quarantine, animal ante and post-mortem inspections and publicity. The use of safety equipment during slaughtering is an important consideration, but a rapid mass animal vaccination programme needs to be implemented.[6]

Further concern is that RVF, as other viral diseases, such as dengue, measles, lassa fever, yellow fever,[14–18] and COVID-19, commences with fever, headache, and myalgia. However, differentiating features of RVF are photophobia, visual disturbance in 10% and retinal haemorrhage. Delayed paresis may occur, as may hepatic necrosis, jaundice, and haemorrhagic diatheses.[19] Whereas COVID-19 symptoms are generally respiratory, loss of taste or smell respective diagnosis requires PCR and ELISA (enzyme-linked immunosorbent assay) tests to distinguish between the two.[11]

## Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

## Declaration of conflicting interests:

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## Authors' contributions

Mohammad Yasir Essar conceived the study. Mohammad Mehedi Hasan designed the study. Fatima Muhammad Asad Khan, Zarmina Islam and Syeda Kanza Kazmi wrote the first draft. Ana Carla dos Santos Costa and Mohammad Mehedi Hasan edited the second draft and improved the manuscript. Shoaib Ahmad and Mohammad Yasir Essar made the critical comments and revision. All authors revised and approved the final draft.

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