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## Enhanced surveillance and cohesive policies needed to tackle Rift Valley fever

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Dear editor,

There has been an upsurge in Rift Valley fever (RVF) outbreaks in Kenya in the recent past. Even as I write this letter, the country is experiencing an outbreak which was confirmed by the Ministry of Health on 8 June 2018[1]. The current outbreak was first reported in Wajir County on 2nd June but has currently spread to other counties and killed up to 26 people from the counties of Wajir, Marsabit and Siaya. Six other counties have also been identified as having the highest risk of an outbreak. These include Tharaka-Nithi, Garissa, Tana River, Lamu, Garissa, Kajiado and Baringo counties whereas Mombasa and Nairobi are on heightened alert[2].


RVF is a mosquito-borne viral zoonosis that infects both livestock and humans. It's caused by RVF virus, a negative-sense, single-stranded RNA virus, family *Bunyaviridae*, genus *Phlebovirus*. In livestock, the disease is characterized by forceful abortions and perinatal mortality with small livestock like sheep and goats showing a higher susceptibility as compared to large ones like Zebu cattle and Camels. In humans, the illness manifests with influenza like symptoms with occasional cases of encephalitis, retinitis, and generalized haemorrhagic syndrome in less than 8% of the infected. The disease was first isolated in sheep in Naivasha district in the former Rift Valley Province of Kenya in 1930 and described in 1931[3]. Since then, RVF has expanded in geographical distribution with every outbreak[4], and this has been attributed to environmental factors like rainfall and temperature, the density and movement of livestock and the presence of competent vector species[5]. Up to the current outbreak, Kenya has suffered 25 outbreaks since 1931 with eleven of these considered to be severe national epizootics that affected more than 3 districts[4].

Outbreaks are associated with unusually heavy rainfall, high humidity and increased vegetation cover as a result of the warming up of the ocean surfaces of the Indian and the Pacific oceans. This leads to extensive flooding resulting in mass emergence of flood water *Aedes* mosquitoes, some of which are infected with RVF virus from infected drought resistant eggs[6]. The infected female adult *Aedes spp* initiates transmission to nearby animals including sheep, goats, cattle, and camels which serve as amplifiers, infecting more mosquitoes. Secondary vectors, mainly from the *Culex*, *Anopheles* and *Mansonia* species, may also take over the breeding sites and propagate RVF virus transmission to additional animals and humans resulting into outbreaks[5].

The current outbreak in Kenya follows another outbreak that occurred in November 2014 to January 2015 and a previous major outbreak that occurred in 2006/2007 that caused the death of more than 150 people and losses to the extent of US \$ 32 million due to hospitalization and care for the sick, losses of animal herds, vaccination costs and trade bans/value chain ramifications[7]. Previously, in 1997-1998, another major outbreak occurred in 3 East African countries of Kenya, Tanzania and Somalia and affected over 100 000 people whereby more than 450 died in Kenya alone[8].

Outbreaks of RVF have also been reported in other African countries like Egypt in 1977-1979 which affected over 200 000 people and caused over 600 deaths[9], South Africa in 1951 where over 100 000 sheep died and half a million livestock suffered abortions[10] in Mauritania, Senegal, Sudan and Madagascar. The disease has also been reported in the Arabian Peninsula. Saudi Arabia and Yemen[11].

It's therefore possible that failure to control a RVF outbreak could seriously impact veterinary and human health not only in Kenya but Africa, Middle East and the rest of the world. This could have far

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reaching economic consequences due to massive loss of livestock, consequent export embargoes, and significant human morbidity and mortality. To exacerbate the problem, RVF virus has been described as a high-impact trans-boundary pathogen with potential for bioterrorism[12].

**Climatic modelling and RVF forecasting:** Outbreaks of RVF in Kenya have been associated with heavy rainfall and flooding, high humidity and increased vegetation cover as results of El Niño–Southern Oscillation phenomenon[13]. Therefore, satellite images and weather/climate forecasting data could be used to predict an impending outbreak and thus initiate vaccination of livestock in time to avert impending epidemics. However, positive results can only be achieved if the predictions are taken seriously and the important steps taken in time.

**Vaccination:** Animal immunization not only prevents the transmission of RVF in livestock but it has been established that humans mainly get serious infections by the RVF virus from contact with fluids and secretions from infected animals[13]. Therefore, sustained animal vaccination programme could majorly avert outbreaks in humans too. However, immunization must be implemented prior to an outbreak to avoid intensifying the outbreak through the use of multi-dose vials and the re-use of needles and syringes.

**Establishment of an active animal health surveillance system:** This would help to detect new cases and could prevent and/or slow the outbreak by providing early warning for veterinary and human public health authorities to prevent spill overs from animals to humans[14].

**Banning livestock movement and livestock markets:** Restricting livestock movement and sale during outbreaks may slow the expansion of the virus from infected to uninfected areas.

**Public health education and awareness:** Awareness message focussing on risk reductions in terms of safe animal husbandry and slaughtering practices to reduce animal-to-human transmission should be prioritized during outbreaks. The use of impregnated mosquito nets, personal insect repellent if available and avoidance of outdoor activities that exposes individuals to infective bites should be encouraged.

**Standard precautions by healthcare workers:** Health care staff caring for patients with suspected or confirmed RVF should practise standard precautions governing the handling of blood (including dried blood) and all other body fluids, secretions and excretions (excluding sweat).

**Vector control:** Larviciding breeding sites is an effective form of vector control especially where breeding sites can be clearly identified and are limited in size and extent. The animals could also be sprayed with repellents to prevent mosquito bites.

## Conflict of interest statement

The author declares that she has no conflict of interest.

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