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PANORAMA

Thematic portfolio

Strengthening preparedness and resilience to emergencies

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Rift Valley fever (RVF) is an acute viral disease of domestic animals (cattle, buffalo, sheep, goats, and camels) and humans. It is endemic to sub-Saharan Africa, the Arabian Peninsula (Saudi Arabia and Yemen), and Madagascar. RVF poses a threat to public health and the livestock trade in affected countries, with estimated trade losses of US$ 250 million caused by outbreaks since 2006. It has the potential for introduction into new areas through imported livestock or virus-infected mosquito vectors. Epizootics and epidemics are associated with periods of above-normal rainfall (for more than 60 days), allowing multiple generations of infected vectors to propagate and infect livestock and human populations.

The prevention, control and mitigation of RVF in endemic countries and regions require effective surveillance measures, both passive and active. While passive RVF surveillance relies on general animal health surveillance conducted by Veterinary Services, including reports from livestock keepers and other affected sectors, active surveillance includes measures taken by Veterinary Services to specifically monitor the possible circulation of the RVF virus, and also to collect and analyse data on factors that directly influence the occurrence of RVF, such as climate and competent insect-vector pressure. Control measures thus consist of medical and sanitary prophylaxis. Medical prophylaxis consists of vaccination and the implementation of an appropriate vaccination strategy. Sanitary prophylaxis focuses on climate surveillance systems that feed early-warning systems. It uses these early-warning systems to conduct targeted vector surveillance and control and, when at-risk areas have been identified, puts livestock movement controls and zoning in place to mitigate the risk of human and animal outbreaks.

> Coordination between the human and animal health sectors is of the utmost importance

At present, RVF tends to be first noticed when human cases appear. This must change. Measures that alert both the veterinary and public health sectors when RVF first appears in livestock have the potential to greatly mitigate the disease's impacts on both animal and human health.

Climate surveillance and early-warning systems

Current early-warning systems gather data on various climate measurements, including sea-surface temperatures as an indicator of the phase and amplitude of El Niño/the Southern Oscillation (ENSO), rainfall, and vegetation conditions. The data are then used to map areas at potential risk of outbreaks [1] (Fig. 1). These early-warning systems can provide three to six months' lead time before a possible outbreak (Fig. 2). Such early warnings need to be accompanied by on-the-ground vector surveillance and control in areas deemed to be at potential risk, and by vaccination and public awareness campaigns [2].

In addition, emergency preparedness and resilience during inter-epidemic periods is vital. Under changing climate conditions, accompanied by extreme rainfall, the risk of outbreaks is elevated [3]. It is important to employ a risk-based approach to control strategies, including seasonally and geographically targeted vaccination and health promotion campaigns.

Vaccination strategy

The RVF livestock vaccines currently available have clearly demonstrated their effectiveness in controlling RVF in enzootic and epizootic situations. At present, vaccination approaches to RVF [4] are still limited and should be expanded to other endemic and at-risk countries. The costs of not vaccinating, shown by a number of recent outbreaks, should demonstrate the need for national and regional vaccination strategies, which may include the establishment of regional vaccine banks.

Conclusions

Countries need to pay attention to early-warning systems and implement vector control, while establishing effective RVF vaccination strategies. Regional approaches to RVF control, which should also involve public health, are of the utmost importance in high-risk areas if there is to be an efficient response to RVF alerts and outbreaks.

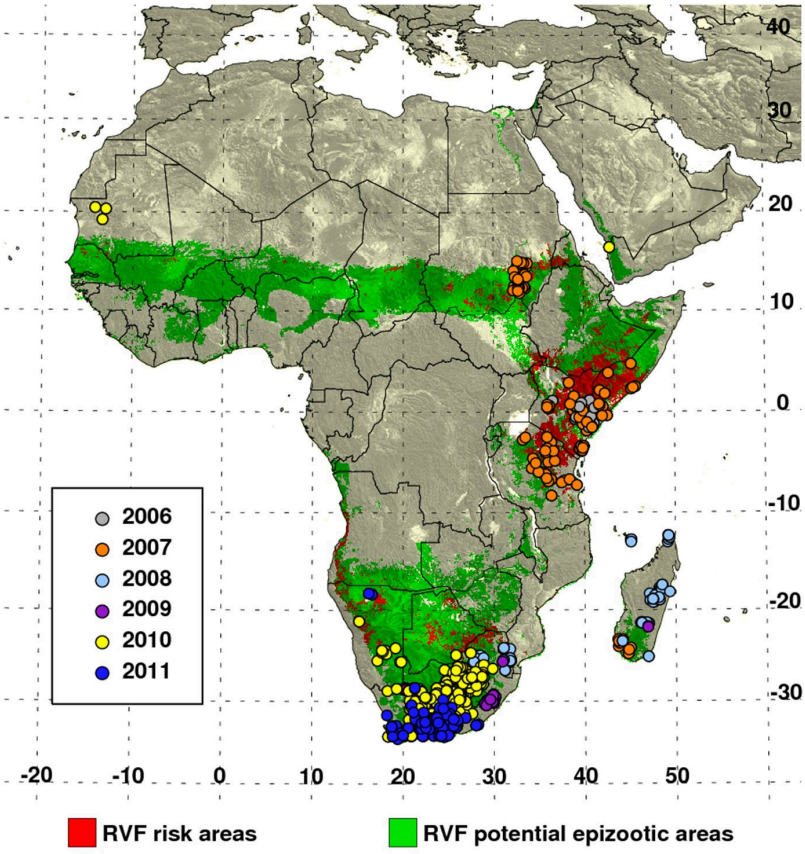

Fig. 1. Composite Rift Valley fever risk map showing areas at risk in red and locations of various outbreaks between 2006 and 2011. Regional epicentres of outbreaks are in Eastern Africa and Southern Africa modulated by rainfall variability associated with El Niño and La Niña phases of the El Niño/Southern Oscillation.

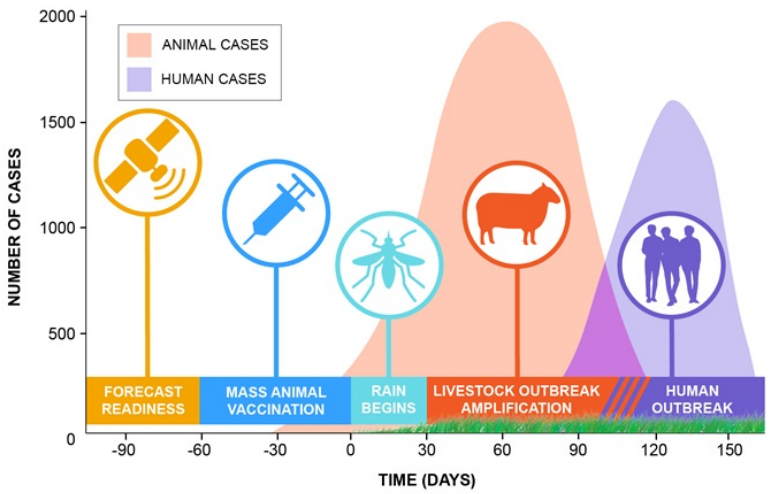

Fig. 2. Idealised Rift Valley fever early warning timeline based on data from Eastern and Southern Africa.
Concept by Assaf Anyamba, design and art by Heidi Tubbs, Universities Space Research Association (USRA) & NASA/Goddard Space Flight Center.

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DOSSIER

Rift Valley fever and the challenges of remaining fully prepared for this periodic emergency

KEYWORDS

#animal health, #climate change, #emergency preparedness, #One Health, #public health, #Rift Valley fever (RVF), #vaccination, #vector control.

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