MONTHLY SCIENTIFIC REVIEW
ON RIFT VALLEY FEVER VIRUS

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Situation at a glance

- Rift Valley fever (RVF) is a viral zoonosis caused by an arbovirus, which can lead to hemorrhagic fever.
- The first major human outbreak occurred in 1977 in Egypt, causing between 18,000 and 200,000 cases depending on the source, and around 600 deaths.
- Since the declaration of the outbreak on 25 September, Senegal has reported 536 confirmed cases including 31 deaths, and Mauritania has reported 53 confirmed cases including 14 deaths as of 10 December.

Scientific articles

This section presents relevant articles published on peer-reviewed scientific journals or pre-print platforms.

2025-09-08

Limiting viral replication in hematopoietic cells delays Rift Valley fever virus disease progression in C57BL/6 mice.

Journal: J Virol

Authors: Lingqing Xu, Alden C Paine, Dominique J Barbeau, William Klimstra, Anita K McElroy

RVFV targets hematopoietic cells, contributing to disease progression. A recombinant virus, RVFVmiR-142, with limited replication in these cells, delayed disease in mice, highlighting the role of hematopoietic cells in RVFV pathogenesis.

See details

2025-01-25

Co-Infection of Culex tarsalis Mosquitoes with Rift Valley Fever Phlebovirus Strains Results in Efficient Viral Reassortment.

Journal: Viruses

Authors: Emma K Harris, Velmurugan Balaraman, Cassidy C Keating, Chester McDowell, J Brian Kimble, Alina De La Mota-Peynado, Erin M Borland, Barbara Graham, William C Wilson, Juergen A Richt, Rebekah C Kading, Natasha N Gaudreault

RVFV reassortment in Culex tarsalis mosquitoes is more frequent than in ruminants, with higher rates in midgut and salivary tissues. Co-infection with virulent and attenuated strains yields varied reassortment rates in salivary glands. Mosquitoes may drive RVFV evolution, impacting transmission and virulence.

See details

2025-02-24

PROJECTING CLIMATE CHANGE IMPACTS ON INTER-EPIDEMIC RISK OF RIFT VALLEY FEVER ACROSS EAST AFRICA.

Journal: medRxiv

Authors: Evan A Eskew, Erin Clancey, Deepti Singh, Silvia Situma, Luke Nyakarahuka, M Kariuki Njenga, Scott L Nuismer

This study projects increased inter-epidemic Rift Valley fever (RVF) risk in East Africa due to climate change, with hotspots in east Kenya, southeast Tanzania, and southwest Uganda. Risk is expected to rise January-March, potentially exposing over 117 million people by 2061-2080. Enhanced surveillance and control measures are recommended to mitigate future health impacts.

See details

2025-09-15

A DNA vaccine candidate provides protection against Rift Valley Fever virus in sheep under natural field conditions.

Journal: Front Cell Infect Microbiol

Authors: Moufid Mhamadi, George Giorgi Babuadze, Aminata Badji, Marie-Edith Nepveu-Traversy, El Hadji Ndiaye, Alioune Gaye, Mignane Ndiaye, Moundhir Mhamadi, Frank William Mendy, Cheikh Talibouya Touré, Idrissa Dieng, Moussa Dia, Ndeye Sakha Bob, Marc-Antoine de La Vega, Ousmane Faye, Amadou Alpha Sall, Mawlouth Diallo, Gary Kobinger, Oumar Faye, Hugues Fausther-Bovendo

A DNA vaccine encoding a consensus RVFV GPC was designed and evaluated in mice and sheep. It induced robust humoral responses and provided protection in sheep under natural field conditions in Senegal, with reduced infection rates and persistent neutralizing antibody responses for over a year. The vaccine was well-tolerated, even in pregnant animals, demonstrating its potential as a safe, effective, and affordable alternative to existing veterinary vaccines for RVFV.

See details

2025-07-02

Development of a high-sensitivity vertical flow immunoassay for the detection of Rift Valley fever virus.

Journal: Microbiol Spectr

Authors: Alexander J Summers, Haydon J Hill, Jasmine P Devadhasan, Jian Gu, Vanessa Berner, Sujata G Pandit, Marcellene A Gates-Hollingsworth, Kathryn J Pflughoeft, Douglas C Montgomery, Supriya Atta, Tuan Vo-Dinh, David P AuCoin, Frederic Zenhausern

This study developed a rapid, sensitive vertical flow immunoassay (VFI) for Rift Valley fever virus (RVFV) detection in human serum, achieving 2.5-fold higher sensitivity than lateral flow immunoassays (LFIs) with minimal cross-reactivity, offering a promising tool for early RVFV diagnosis in resource-limited settings.

See details

2025-01-25

The Dissemination of Rift Valley Fever Virus to the Eye and Sensory Neurons of Zebrafish Larvae Is Stat1-Dependent.

Journal: Viruses

Authors: Sebastiaan Ter Horst, Aleksandra Siekierska, Ann-Sofie De Meulemeester, Arno Cuvry, Laura Cools, Johan Neyts, Peter de Witte, Joana Rocha-Pereira

Zebrafish larvae model reveals RVFV targets eye and sensory neurons, causing blindness. Stat1-dependent dissemination; JAK inhibition or stat1a knockout enhances viral replication but prevents dissemination.

See details

2025-09-26

Altered histone modifications in Aedes aegypti following Rift Valley fever virus exposure.

Journal: bioRxiv

Authors: Hunter A Ogg, Zoey M Mikol, David C King, Chad E Mire, Zeyad Arhouma, Erin Osborne Nishimura, Rebekah C Kading, Corey L Campbell

RVFV infection in Aedes aegypti alters histone modifications, notably H3K27ac, affecting gene expression. Immune response genes are initially enriched but depleted later, suggesting viral manipulation. Hedgehog signaling genes are also depleted. Bloodfeeding alone induces global histone modification changes. These findings highlight a complex interplay between viral replication and host responses.

See details

2025-03-27

A Novel BoHV-1-Vectored Subunit RVFV Vaccine Induces a Robust Humoral and Cell-Mediated Immune Response Against Rift Valley Fever in Sheep.

Journal: Viruses

Authors: Selvaraj Pavulraj, Rhett W Stout, Shafiqul I Chowdhury

A BoHV-1-vectored subunit RVFV vaccine, modified for sheep, induces moderate vector- and vaccine-specific neutralizing antibodies and cellular immunity. Intranasal booster significantly increases vaccine-specific antibody titers, showing potential as an effective RVFV vaccine for sheep.

See details

2025-01-27

Atypical hyperendemicity of Rift Valley fever in Southwestern Uganda associated with the rapidly evolving lineage C viruses.

Journal: medRxiv

Authors: Barnabas Bakamutumaho, John Juma, Erin Clancey, Luke Nyakarahuka, Silvia Situma, Raymond Odinoh, Jeanette Dawa, Carolyne Nasimiyu, Evan A Eskew, Stephen Balinandi, Sophia Mulei, John Kayiwa, John D Klena, Trevor R Shoemaker, Shannon L M Whitmer, Joel M Montgomery, John Schieffelin, Julius Lutwama, Allan Muruta, Henry Kyobe Bosa, Scott L Nuismer, Samuel O Oyola, Robert F Breiman, M Kariuki Njenga

SW Uganda exhibits atypical RVF hyperendemicity with sustained human cases, high prevalence, and increased yearly cases, linked to rapidly evolving lineage C.2.2 viruses.

See details

2025-04-24

Stability analysis of Rift Valley fever transmission model with efficient and cost-effective interventions.

Journal: Sci Rep

Authors: Samson Olaniyi, Olajumoke D Falowo, Abiodun T Oladipo, Gideon K Gogovi, Adekunle O Sangotola

This study introduces a mathematical model for RVF, incorporating time-dependent treatment, vaccination, and sanitation. It analytically establishes RVF-free and endemic equilibria, characterizes their coexistence via bifurcation analysis, and assesses global stability. Optimal control strategies are explored, with efficiency and cost-effectiveness analyses identifying the most effective interventions, offering insights into RVF dynamics and suggesting optimal, low-cost control measures.

See details

2025-01-08

Serological Evidence of Cryptic Rift Valley Fever Virus Transmission Among Humans and Livestock in Central Highlands of Kenya.

Journal: Viruses

Authors: Silvia Situma, Evans Omondi, Luke Nyakarahuka, Raymond Odinoh, Marshal Mweu, Marianne W Mureithi, Martin M Mulinge, Erin Clancey, Jeanette Dawa, Isaac Ngere, Eric Osoro, Bronwyn Gunn, Limbaso Konongoi, Samoel A Khamadi, Johan Michiels, Kevin K Ariën, Barnabas Bakamutumaho, Robert F Breiman, Kariuki Njenga

This study found no active RVF infections in Kenya's central highlands but detected serological evidence of recent transmission in 4.4% of livestock and 2.0% of humans. Risk factors for human exposure included male gender, raw milk consumption, milking activities, and proximity to quarries. Sheep and goats were less likely to be seropositive than cattle, suggesting a widening geographic dispersal of RVF and increased risk of future epidemics.

See details

2025-10-28

A Single Dose of Live-Attenuated Rift Valley Fever Virus Vector Expressing Peste Des Petits Ruminants Virus (PPRV) H or F Antigens Induces Immunity in Sheep.

Journal: Vaccines (Basel)

Authors: Sandra Moreno, Gema Lorenzo, Verónica Martín, Celia Alonso, Friedemann Weber, Belén Borrego, Alejandro Brun

Recombinant RVFV vectors expressing PPRV H or F antigens were stable and immunogenic in mice and sheep, inducing neutralizing antibodies and cellular immune responses against both viruses. The F protein-expressing vector showed greater efficacy, suggesting potential for a dual-protective vaccine against RVF and PPR.

See details

2025-11-15

Safety, tolerability, and immunogenicity of the ChAdOx1 RVF vaccine against Rift Valley fever among healthy adults in Uganda: a single-centre, single-blind, randomised, placebo-controlled, dose-escalation, phase 1 trial.

Journal: Lancet Infect Dis

Authors: Zacchaeus Anywaine, Jennifer Serwanga, Abu-Baker Mustapher Ggayi, Andrew Max Abaasa, Daniel Wright, Ben Gombe, Peter Ejou, Tamara Namata, Antony Kigozi, Naboth Tukamwesiga, Vincent Basajja, Violet Ankunda, Dora Jocelyn Mulondo, Florence Nambaziira, Ayoub Kakande, Wilson Kakeeto, Phiona Nabaggala, Daniel Jenkin, Alison Lawrie, Pedro Folegatti, Nguyen Tran, Christian Hansen, Alison M Elliott, Adrian V S Hill, George M Warimwe, Pontiano Kaleebu

This phase 1 trial in Uganda found the ChAdOx1 RVF vaccine safe, tolerable, and immunogenic in healthy adults. By day 14, 75-90% of participants developed neutralizing antibodies, with the highest dose (5·0 × 10 10 virus particles) eliciting the strongest and most sustained responses. Further evaluation of this dose is recommended.

See details

Relevant news

This section presents official reports from health agencies, manufacturers and press releases with reliable sources.

2025-10-28

Quick takes: More Rift Valley fever in Senegal, mpox clade 1b threat, avian flu on California duck farm

Source: CIDRAP

Senegal's Rift Valley fever outbreak has grown to 302 cases, 26 deaths, spreading to eight regions. UKHSA raises mpox clade 1b importation risk to high due to person-to-person transmission outside Africa. USDA reports HPAI detection on a California duck farm, affecting 57,300 birds.

See details

2025-10-31

Consultation on Rift Valley Fever (RVF) research

Source: WHO

This consultation, part of the Phenuiviridae CORC, aims to develop a CORE Clinical Trial Protocol for RVF vaccines during outbreaks, focusing on study design, endpoints, and trial designs, including immunological endpoints, following recent outbreaks in Senegal and Mauritania.

See details

2025-11-12

WHO EPI-WIN Webinar: Rift Valley Fever and community protection: gaps, needs and priorities

Source: WHO

This webinar focuses on Rift Valley Fever (RVF) outbreaks in Senegal and Mauritania, emphasizing community protection, engagement, and social protection. It aims to identify practical actions and evidence gaps for community-centered outbreak response, featuring updates from WHO and experts, and a panel discussion on community-based priorities and surveillance.

See details

Clinical Studies

This section presents relevant clinical trials.

2024-09-20

Safety and Immunogenicity of a Candidate Rift Valley Fever Vaccine (RVF003)

Status: Active not recruiting

Sponsor(s): University of Oxford

The goal of this clinical trial is to learn if ChAdOx1 RVF, a candidate vaccine against RVF, provides an adequate immune response and determine its safety among Kenyan adults. The main aims are: * To assess the proportion of individuals mounting an immune response following vaccination with a single dose of ChAdOx1 RVF * To monitor occurrence of any adverse events following vaccination * To assess whether two doses of ChAdOx1 RVF elicit an immune response that is more durable than that generated by a single dose of ChAdOx1 RVF Researchers will compare ChAdOx1 RVF vaccine to a rabies vaccine in 240 participants. Participants will be randomly allocated to one of three study groups and vaccinated with ChAdOx1 RVF or a control Rabies vaccine as follows. Group 1, composed of 120 participants, will receive a single dose of ChAdOx1 RVF vaccine at baseline and a single dose of rabies vaccine 3 months later. Group 2, composed of 60 adults, will receive two doses of ChAdOx1 RVF; the first dose at baseline and the second dose 3 months later. Group 3, composed of 60 adults, will receive two doses of rabies vaccine; the first dose at baseline and the second dose 3 months later. Participants will receive daily phone calls after each vaccination for the following six days to gather information on any symptoms they may experience. Participants will be instructed to contact the study team at any time should they experience any clinical symptoms. Blood samples will be collected at baseline (before vaccination) and at scheduled follow-up visits (8 visits over the duration of the study, i.e. days 7, 14, 28, 84, 91, 112, 365 and 540 after the first vaccination) for monitoring of immune responses. Up to 20mls of blood will be collected at each scheduled visit. Participants will be followed-up for 18 months from the first dose of vaccine. Adverse events following vaccination will be monitored throughout the study and reviewed by an independent Data and Safety Monitoring Board (DSMB)

See details

Guidelines and practical information

This section lists official manuals of recommendations for clinical practice or public health policy published by leading health organizations.

WHO	**Rift Valley Fever Outbreak Toolbox**
RBC	**GUIDELINES ON RIFT VALLEY FEVER**

Fact sheets

Phylogeny

Rift Valley fever (RVFV) is a viral zoonosis that primarily affects ruminants (sheep, cattle, goats). It is caused by a virus belonging to the Phlebovirus genus, first identified in 1931 during an outbreak in sheep in the Rift Valley, Kenya.

Transmission

The virus is mainly transmitted through direct contact with the blood, biological fluids, or tissues of infected animals during handling, and through the consumption of undercooked meat or raw milk. Vector-borne transmission by bites from infected mosquitoes (notably Culex pipiens and Aedes albopictus) plays a role in spreading the virus among animals and, to a lesser extent, humans. No human-to-human transmission has been documented to date.

Diagnosis

Rift Valley fever can be confirmed by several laboratory methods, including RT-PCR, ELISA testing, viral isolation, and serum neutralization tests. Rapid tests for detecting RVFV antigen are available in animals, but no official WHO or OIE/WOAH sources recommend their validated, standardized use as a substitute for molecular testing.

Symptoms

In animals, RVFV causes mass abortions and high mortality, leading to major economic impacts for livestock owners. In humans, 80–90% of cases are asymptomatic or mild; 10–20% present with fever, headaches, pain, vomiting, and bleeding; and 1–3% progress to severe forms (hemorrhage, encephalitis, retinitis). The incubation period ranges from 2 to 6 days.

Treatment

No specific treatment is available for RVFV infection in either animals or humans. Management therefore relies on symptomatic treatment. In more severe cases, treatment primarily consists of early and intensive supportive care, focused on rehydration and symptom control.

Vaccination

Animal vaccination is possible, and among veterinary vaccines, the main ones are the live attenuated Smithburn, Clone 13, and MP-12 vaccines, which are effective after a single dose but carry risks for pregnant females. Inactivated vaccines such as the BEI-ZH501, Menya/Sheep/258, and OBP strains are safer—particularly during pregnancy— but require multiple doses and boosters. Regarding human vaccination, only one vaccine has been used so far: the inactivated human vaccine TSI-GSD-200, developed by the US Army. However, it is not yet commercially available and remains experimental, intended to protect veterinarians and high-risk laboratory personnel.

Prevention also relies—primarily—on non-medical measures aimed at limiting virus

transmission. This includes reducing the risk of animal-to-human transmission through the use of gloves and protective equipment when handling animals or their biological products. Personal and community protection against mosquito bites is also essential.