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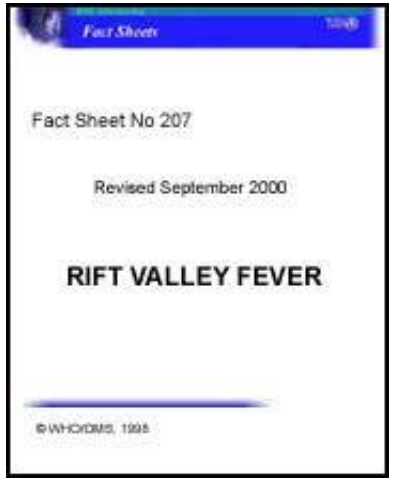


## Fact sheet No 207: Rift Valley Fever - Revised September 2000 (WHO, 2000, 4 p.)

- *(introduction...)*
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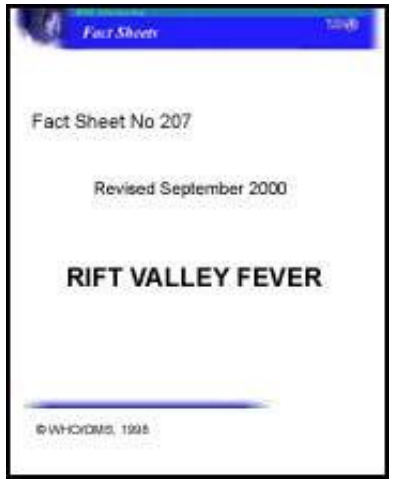


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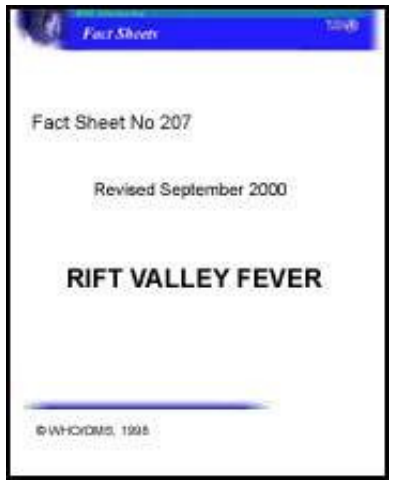


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- *(introduction...)*
- **Rift Valley Fever**

## Rift Valley Fever

## Overview

**Rift Valley Fever (RVF), is a zoonosis (a disease which primarily affects animals, but occasionally causes disease in humans). It may cause severe disease in both animals and humans leading to high morbidity and mortality. The death of RVF-infected livestock often leads to substantial economic losses.**

**Since 1930, when the virus was first isolated during an investigation into an epidemic amongst sheep on a farm in the Rift Valley of Kenya, there have been outbreaks in sub-Saharan and North Africa. In 1997-98, there was a major outbreak in Kenya and Somalia. In September 2000, RVF was for the first time reported outside of the African Continent. Cases were confirmed in Saudi Arabia**

**and Yemen. This virgin-soil epidemic in the Arabian Peninsula raises the threat of expansion into other parts of Asia and Europe.**

**Many different species of mosquitoes are vectors for the RVF virus. There is, therefore, a potential for epizootics (epidemics amongst animals) and associated human epidemics following the introduction of the virus into a new area where these vectors are present. This has been demonstrated in the past and remains a concern.**

## RVF Virus

**The virus, which causes RVF, is a member of the *Phlebovirus* genus, one of the five genera in the family *Bunyaviridae*.**

## RVF Vectors

- **RVF virus is primarily spread amongst animals by the bite of infected mosquitoes.**

- **A wide variety of mosquito species may act as the vector for transmission of the RVF virus; in different regions a different species of mosquito may prove to be the predominant vector. In addition, the various vector species play differing roles in sustaining transmission of the virus.**

- ***Aedes* mosquitoes, for example, may acquire the virus from feeding on infected animals, and are capable of transovarial transmission (transmission of the virus from infected female mosquitoes to offspring via eggs), so new generations of infected mosquitoes may hatch from their**

**eggs.**

**This provides a durable mechanism for maintaining the virus in nature, as the eggs of these mosquitoes may survive for periods of up to several years in dry conditions. During periods of inundation of larval habitats by rainfall, for example, in the rainy season, the eggs will hatch, and the mosquito population will increase and spread the virus to the animals on which they feed.**

**Previously uninfected *Aedes* and other species of mosquitoes will feed on infected, viraemic (virus circulating in the bloodstream) animals and thus amplify and perpetuate the outbreak by transmitting the virus to the animals on which they subsequently feed.**

## RVF Virus Non-human Hosts

- **Many types of animals may be infected with RVF, and disease may be severe in many domesticated animals including cattle, sheep, camels and goats. Sheep appear to be more susceptible than cattle and goats are less susceptible.**

- **Exotic breeds, which have been recently introduced into an endemic area, fare worse than breeds long adapted to local conditions.**

- **Animals of different ages also differ in their susceptibility to severe illness: over 90% of lambs infected with RVF die, whereas mortality amongst adult sheep can be as low as 10%.**

- **The abortion rate amongst pregnant, infected ewes is almost 100%. An epizootic (epidemic animal disease) of RVF is usually first manifested as a wave of unexplained abortions amongst livestock. This may signal the start of an epidemic.**

## Transmission to Humans

- **During epizootics, people may become infected with RVF either by being bitten by infected mosquitoes, or through contact with the blood, other body fluids or organs of infected animals.**

- **Such contact may occur during the care or slaughtering of infected animals, or possibly from the ingestion of raw milk.**

- **The virus may infect humans through inoculation (e.g., if the skin is broken, or through a wound from an infected knife), or through inhalation as an aerosol. The aerosol mode of transmission has also led to infection in laboratory workers.**

## Clinical Features

- **The incubation period (interval from infection to onset of symptoms) of RVF varies from two to six days.**

- **There then follows an influenza-like illness, with sudden onset of fever, headache, myalgia (muscle pain) and backache. Some patients also develop neck stiffness, photophobia (the patient finds exposure to light uncomfortable) and vomiting; in these patients the disease, in the early**

**stages, may be mistaken for meningitis.**

- **The symptoms of RVF usually last from four to seven days, after which time the immune response to infection becomes detectable with the appearance of IgM and IgG antibodies, and the disappearance of circulating virus from the bloodstream.**

## Clinical Features of Severe Cases

- **While most human cases are relatively mild, a small proportion of patients develops a much more severe disease. This generally appears as one of several recognizable syndromes: eye disease, meningoencephalitis (inflammation of the brain and surrounding tissue) or haemorrhagic fever. The proportion of patients developing these three types of complications is about 0.5-2% for eye disease, and less than 1% for meningoencephalitis and haemorrhagic fever syndrome.**

- **The fever and other symptoms described in the preceding section, Clinical Features, may appear in association with eye disease, which characteristically manifests itself in retinal lesions. The onset of eye disease is usually one to three weeks after the first symptoms appear. When the lesions are in the macula, some degree of permanent visual loss will result. Death in patients with only ocular disease is uncommon.**

- **Another syndrome manifests itself with acute neurological disease, meningo-encephalitis. The onset of this syndrome is also usually one to three weeks after the first symptoms appear. Death in patients with only**

**meningoencephalitis is uncommon.**

- **RVF may also manifest itself as haemorrhagic fever. Two to four days after the onset of illness, the patient shows evidence of severe liver disease, with jaundice and haemorrhagic phenomena, such as vomiting blood, passing blood in the faeces, developing a purpuric rash (a rash caused by bleeding in the skin), and bleeding from the gums. Patients with the RVF-haemorrhagic fever syndrome may remain viraemic for up to 10 days. The case-fatality rate for patients developing haemorrhagic disease is high at approximately 50%.**

- **Most fatalities occur in patients who have developed haemorrhagic fever. The total case fatality rate has varied widely in the various documented epidemics, but, overall, is less than 1%.**

## Diagnosis and Treatment

- **Several approaches may be used in diagnosing acute RVF. Serological tests such as enzyme-linked immunoassay (the "ELISA" or "EIA" methods) may demonstrate the presence of specific IgM antibodies to the virus. The virus itself may be detected in blood during the viremia phase of illness or post-mortem tissues by a variety of techniques including virus propagation (in cell cultures or inoculated animals), antigen detection tests, and PCR, a molecular method for detecting the viral genome.**

- **The antiviral drug ribavirin has been shown to inhibit viral growth in experimental systems, but has not been evaluated in the clinical setting.**

**Most human cases of RVF are relatively mild and of short duration, so will not require any specific treatment. For the more severe cases, the mainstay of treatment is general supportive therapy.**

## Prevention and Control

- **RVF can be prevented by a sustained program of animal vaccination. Both live, attenuated, and killed vaccines have been developed for veterinary use. The live vaccine requires only one dose and produces long-lived immunity, but the presently-available vaccine may cause abortion if given to pregnant animals. The killed vaccines do not cause these unwanted effects, but multiple doses must be given to produce protective immunity. This may prove problematic in endemic areas.**

- **An inactivated vaccine has been developed for human use. This vaccine is not licensed and is not commercially available, but has been used experimentally to protect veterinary and laboratory personnel at high risk of exposure to RVF. Other candidate vaccines are under investigation.**

- **The risk of transmission from infected blood or tissues exists for people working with infected animals or people during an outbreak. Gloves and other appropriate protective clothing should be worn, and care taken when handling sick animals or their tissues. Healthcare workers looking after patients with suspected or confirmed RVF should employ universal precautions when taking and processing specimens from patients. Hospitalized patients should be nursed using barrier techniques. As noted above, laboratory workers are at risk, so samples taken for diagnosis from**

**suspected human and animal cases of RVF should be handled by trained staff and processed in suitably equipped laboratories.**

- **Other approaches to the control of disease involve protection from and control of the mosquito vectors. Personal protection is important and effective. Where appropriate, individuals should wear protective clothing, such as long shirts and trousers, use bednets and insect repellent, and avoid outdoor activity at peak biting times of the vector species. Measures to control mosquitoes during outbreaks, e.g., use of insecticides, are effective if conditions allow access to mosquito breeding sites.**

**New systems that monitor variations in climatic conditions are being applied to give advance warning of impending outbreaks by signalling events which may lead to increases in mosquito numbers. Such warnings will allow authorities to implement measures to avert an impending epidemic.**

**For further information, journalists can contact :**
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**WHO HQ, Geneva, Switzerland / Tel +41 22 791 4458/2599 / Fax +41 22 791 4858 / e-Mail: inf@who.int**