

# Filovirus infections

## Susceptible Species

Pathogens of the genera Ebolavirus or Marburg virus have been found in several species of flying foxes and bats, without the animals showing symptoms of disease. Species of the duiker antelope can be fatally infected. In primates (such as gorillas and chimpanzees) and in humans, filoviruses cause hemorrhagic fever with a high mortality rate. Pigs are susceptible to infections with Reston Ebola virus (natural infection) and Ebola virus (experimental infection). The susceptibility of dogs is the subject of studies.

## Geographical Distribution

In 1967, the first filovirus, Marburg virus, was described, which was introduced by African Green Monkeys into laboratories in Marburg, Frankfurt am Main and Belgrade, where it infected 31 humans. The largest Marburg virus outbreak to date occurred in Angola in 2004 to 2005 with 252 humans infected and 227 deaths. Human-pathogenic Ebolaviruses are endemic in Central and probably also West Africa. The species Reston Ebolavirus is endemic in South East Asia. Infections with Ebolaviruses first occurred in 1976 in two simultaneous outbreaks in what is now Southern Sudan and the Democratic Republic of Congo. The largest Ebolavirus outbreak to date began in Guinea in December 2013 and spread mainly to Liberia and Sierra Leone; it officially lasted until March 2016. In total, there were more than 28,000 cases of disease and more than 11,000 deaths during this outbreak.

## Causative Agent

The genera Marburg virus, Ebolavirus, Cuevavirus and Dianlovirus belong to the family of filoviruses. In particular, not much is known about the pathogenicity of the genus Cuevavirus. According to the Ordinance on Biological Substances, filoviruses are classified into risk group 4.

## Transmission

Human-to-human transmission mainly occurs through direct contact with blood, organs or body fluids (such as urine, sweat, stool, vomit) of infected persons. Zoonotic transmission of the virus from great apes or bats to humans may occur through physical contact with infected, sick or dead wild animals ("bush meat").

## Symptoms

Early symptoms in humans and primates are non-specific and flu-like and sometimes associated with high fever. Sore throat, difficulty swallowing, cough, shortness of breath, and chest pain may also occur. Later on, diarrhea, nausea, vomiting and loss of appetite may be seen. From day 5 on, maculopapular rash and hemorrhagic symptoms may occur. Neurological symptoms (seizures, delirium, memory loss, irritability, confusion) are possible. Death generally occurs between day 6 and 10 due to multi-organ failure.

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After experimental infection of pigs with Ebolavirus (species Zaire), respiratory symptoms such as shortness of breath and hyperpnoea as well as fever, loss of appetite and lethargy were the main symptoms

### Diagnostics

The current standard is RT-qPCR for detection of an acute infection and serological tests for detection of a past infection. Laboratory diagnostics should generally be carried out for human samples at the National Reference Centre for Tropical Infectious Diseases, Bernhard Nocht Institute for Tropical Medicine, or at the Consiliary Laboratory for Filoviruses at the Philipps University of Marburg, and for animal samples at the Friedrich-Loeffler-Institut (National Reference Laboratory for Ebolaviruses in Animals).

### Similar clinical pictures

In humans, malaria, typhoid fever, other hemorrhagic fevers, septic diseases and fulminant viral hepatitis show

similar clinical pictures. The patient's medical history, including travel history and risk contacts (e.g. contact with "bush meat") play a decisive role in diagnostics

### Control

Currently, no approved antiviral therapy is available. A recombinant vaccine based on the Vesicular Stomatitis Virus ("Ervebo") as well as another vector-based vaccine ("Zabdeno"/"Mvabea") have been granted conditional approval in the EU. However, they are currently not available in Germany. Patients are treated with supportive intensive care measures.

Suspected human disease, illness and death are reportable, cases in animals are notifiable.

More Information:

[Nationales Referenzlabor für Ebolaviren bei Tieren](#)

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