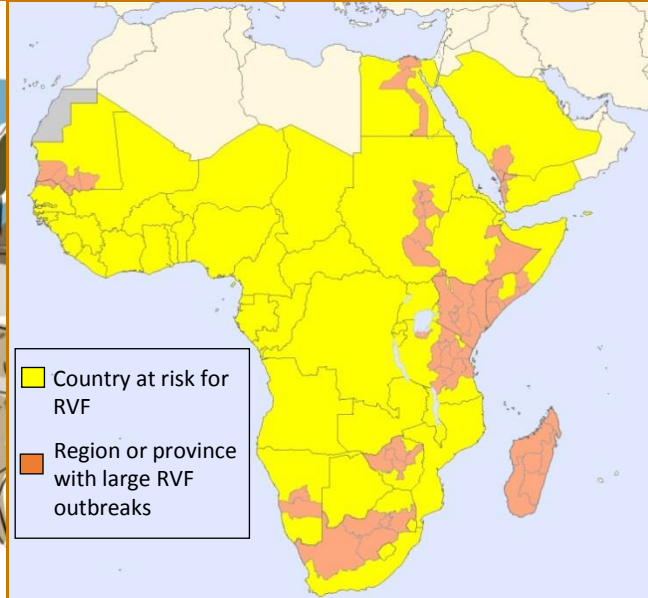
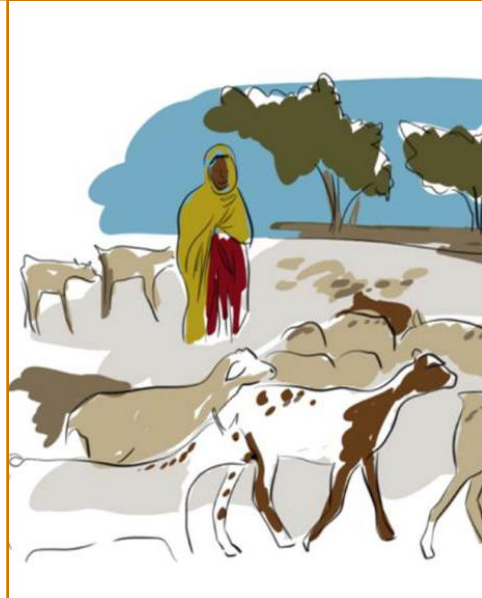


Introduction to Rift Valley Fever

Managing infectious hazards



World Health Organization

- Describe signs, symptoms, and transmission routes of Rift Valley Fever (RVF)
- List prevention and control measures
- Describe areas where Rift Valley Fever is a public health concern.

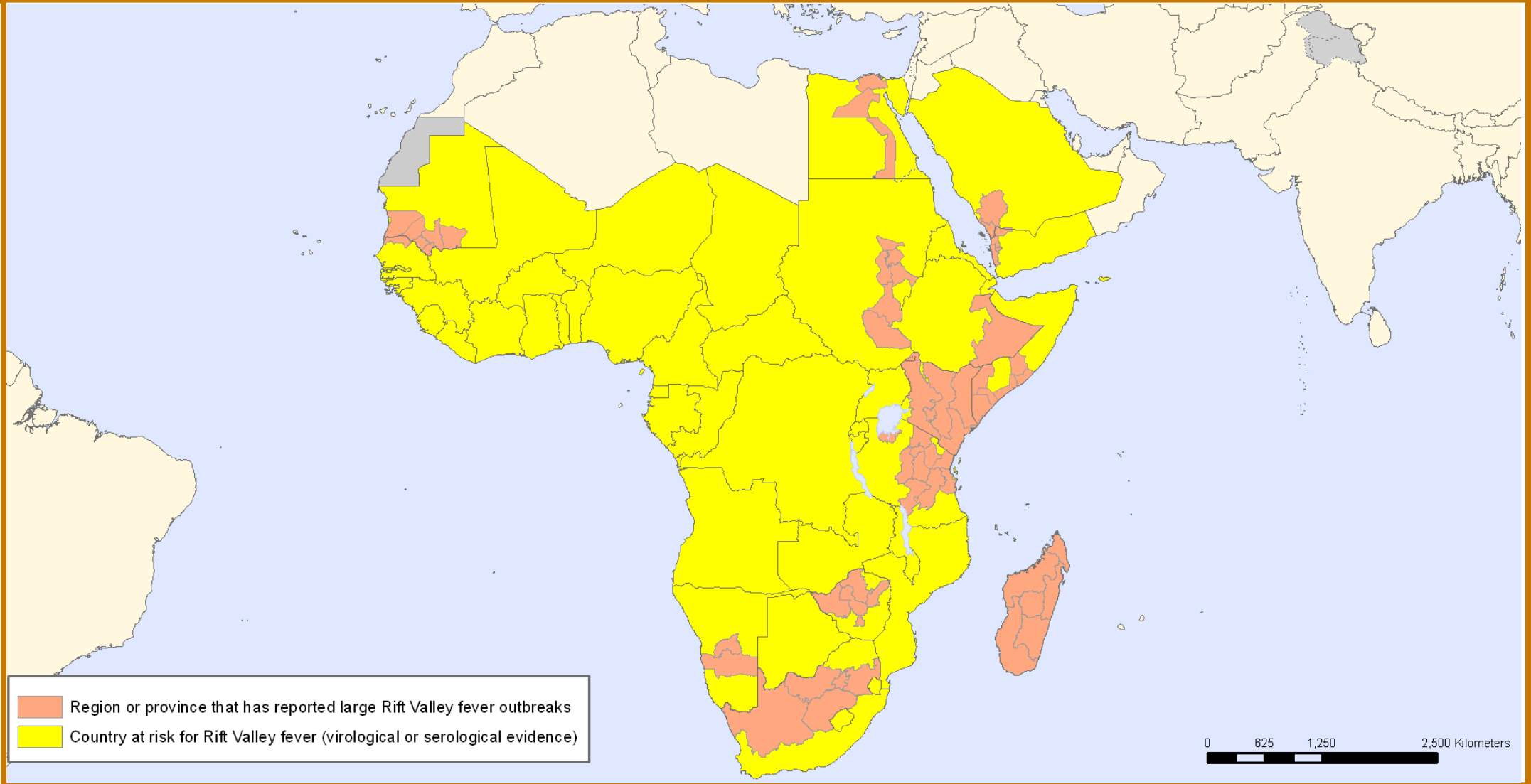


- Rift Valley fever (RVF) is a viral zoonosis that primarily affects animals but can also infect humans
 - RVF outbreaks have been reported in sub-Saharan Africa and Egypt. In 2000, cases were confirmed in Saudi Arabia and Yemen, raising concerns that it could extend to other parts of Asia and Europe
 - Most human infections result from contact with the blood or organs of infected animals
 - Also from the bites of infected mosquitoes
 - 98% of infected people will have subclinical symptoms, only 2 in 100 people will develop a severe disease.
 - To date, **no** human-to-human transmission of RVF virus has been documented





Geographic distribution of Rift Valley fever



Map available at: http://www.who.int/emergencies/diseases/rift-valley-fever/Global_RVF_20090908.png

- 1 billion people at risk

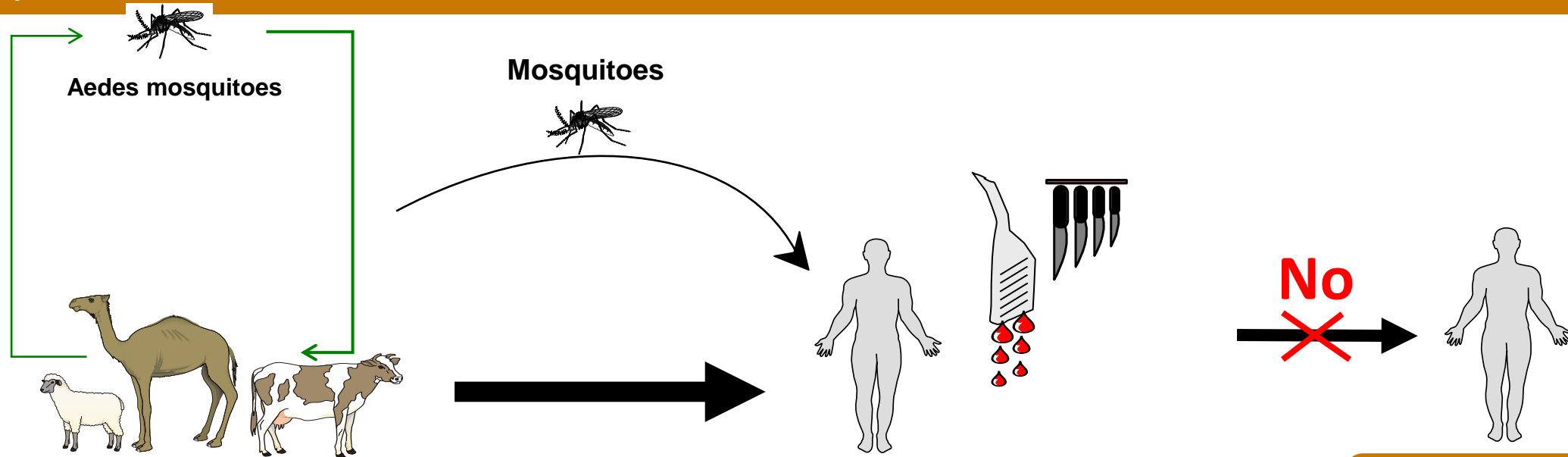
- Huge economic impact on countries animal trade and agricultural sector



Sub-Saharan Africa

- Explosive outbreaks of severe disease in livestock and humans throughout Africa with potential to spread to Middle East, Asia and Europe

Rift valley fever: Transmission



Reservoir *Aedes* mosquitoes

- In nature, RVF virus maintains itself in *Aedes* mosquitoes eggs and in a cycle involving mosquitoes and livestock.
- RVF is responsible of explosive outbreaks of severe disease in domestic animals.

Human infections

- Humans are infected through:
- direct or indirect contact with blood or organs of infected animals during slaughtering or butchering, assisting with animal births, or from disposal of carcasses or fetuses.
 - bites of infected mosquitoes

No secondary human infections

- no human-to-human transmission of RVF virus has been documented



- The incubation period (the interval from infection to onset of symptoms) for RVF varies from 2 to 6 days
- 98 % cases are asymptomatic or unnoticed or develop a mild disease
- Only 2% of cases are severe, with 3 different complications: ocular (eye) disease, meningoencephalitis or haemorrhagic fever

Photo from Madani *et al.* CID, KSA, 2003.



- A feverish syndrome with sudden onset of flu-like fever, muscle pain, joint pain and headache
 - Some patients develop neck stiffness, sensitivity to light, loss of appetite and vomiting; in these patients the disease, in its early stages, may be mistaken for meningitis
- The symptoms of RVF usually last from 4 to 7 days, after which time antibodies become detectable and the virus disappears from the blood

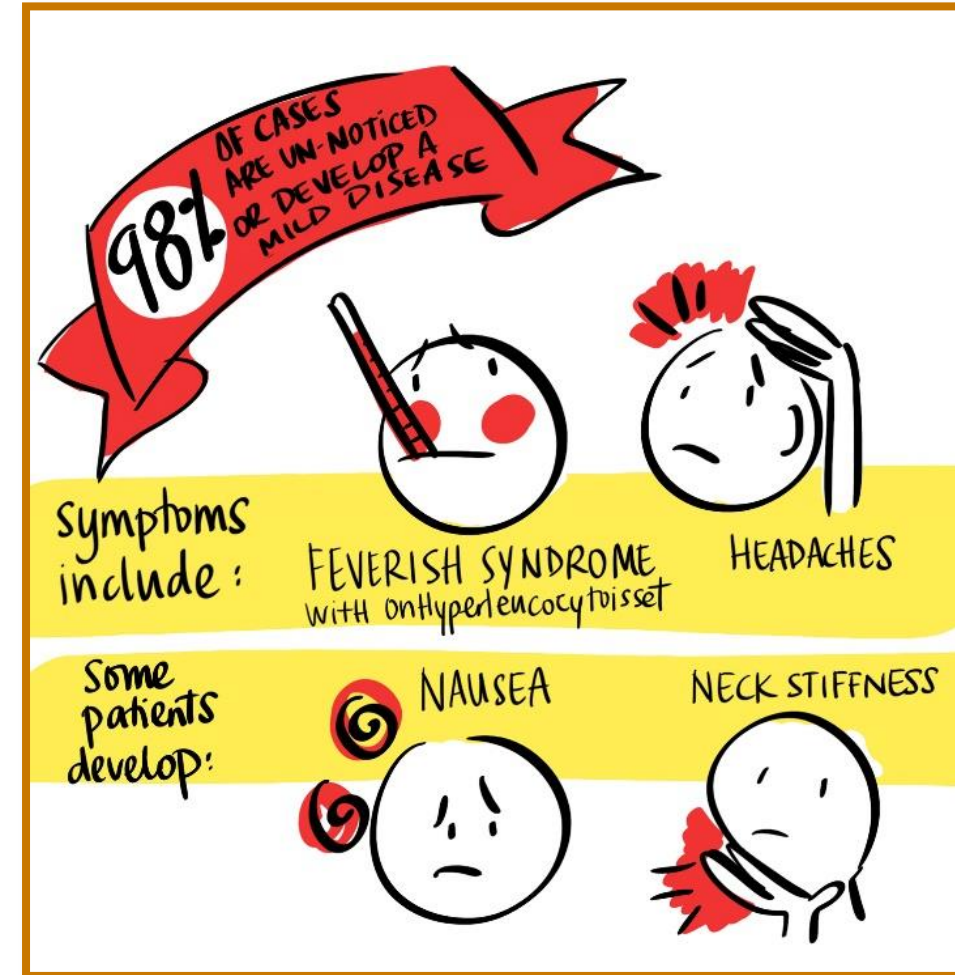




Photo from Madani *et al.* CID, 2003.



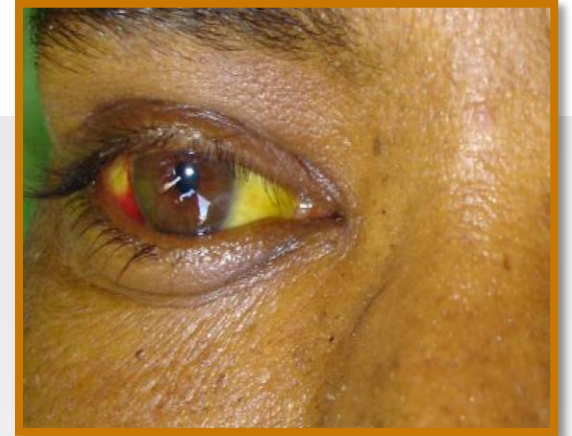
Ocular form: lesions, blurred or decreased vision in the eyes occurring 1 to 3 weeks after first symptoms

Photo by P. Formenty WHO, 2007.



Meningoencephalitic form: intense headache, loss of memory, vertigo, hallucinations, confusion, coma convulsions, occurring 1 to 4 weeks after the first symptoms

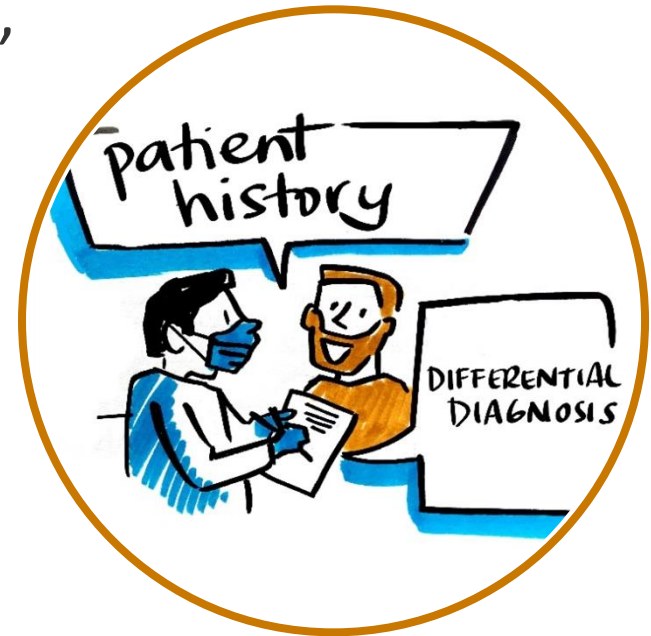
Photo by P. Formenty WHO, 2007.



Hemorrhagic fever form: Initially evidence of severe liver impairment, such as jaundice; then signs of hemorrhage appear occurring 2 to 4 days after the onset of illness



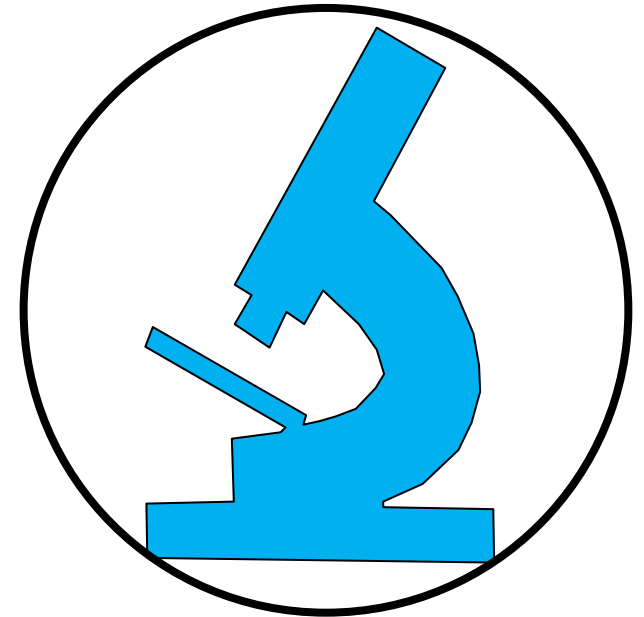
- Symptoms are non-specific; clinical diagnosis may be difficult.
- Differential diagnosis includes other viral haemorrhagic fevers, malaria, leptospirosis, rickettsiosis, relapsing fever, shigellosis, cholera, meningitis, yellow fever, and other viral and bacterial diseases.
- Patient history is essential and should include:
 - exposure to sick animals during slaughtering or butchering, assisting with animal births or disposal of carcasses or fetuses.
 - conducting veterinary procedures.
 - or exposure to area/village where RVF outbreak is reported





Definitive diagnosis requires testing:

- reverse transcriptase polymerase chain reaction (RT-PCR) assay
- IgG and IgM antibodies enzyme-linked immunosorbent assay (ELISA)
- antigen detection tests
- virus isolation by cell culture.



Handling and processing specimen requires **suitably equipped laboratories under maximum biological containment conditions** and staff collecting samples should be **trained**.



Rift Valley Fever severe forms

- Early, aggressive, intensive care support: Monitor fluid and electrolyte balance and renal function, blood pressure, oxygenation, careful rehydration.
- Support of coagulation system with blood component therapy.
- Supportive drug therapy, including: painkillers, antiemetic for vomiting, anxiolytic for agitation, +/- antibiotics and/or antimalarial drugs.
- Not recommended: antiviral drug ribavirin active in vitro but treated patients who survived acute illness died later from encephalitis.

Control RVF outbreak in domestic animals

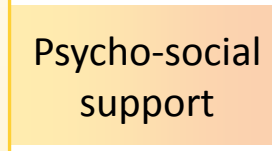
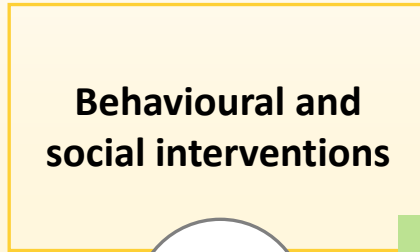
Care for sick people



National leadership

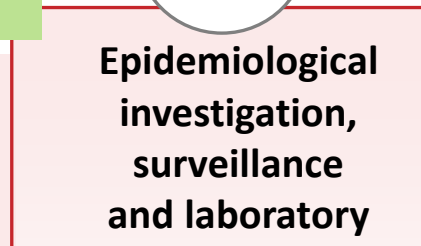
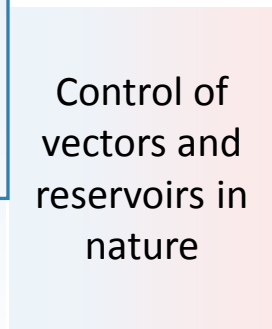
Reduce the risk of transmission from infected animals to humans in animal husbandry, veterinary, and slaughtering practices at home or in facilities

- Conduct social and cultural assessments
- Engage with key influencers: women and/or youth associations, traditional healers, local authorities, religious & opinion leaders
- Formal and informal communication
- Address community concerns

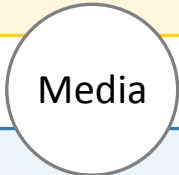


- Triage in/out
- Barrier nursing
- Infection control
- Organize funerals
- Clinical trials
- Ethics committee

- Security, police
- Lodging, food
- Social and epidemiological mobile teams
- Finances, salaries
- Transport vehicles



- Active case-finding
- Follow-up of contacts
- Specimens
- Laboratory testing
- Database analysis
- Search for the source





- Engage with communities to promote desired health practices and behaviours, including reduction of infected animal exposure and safe meat preparation.
- Provide accurate and timely health advice and information on the disease.



Activities related to infected animal husbandry and slaughter practices:

- Avoid or minimize contact with blood and organs from sick animals or dead: do not kill or manipulate without protections carcasses or fetuses of infected animals.
- Hand hygiene: wash your hands with SOAP immediately after every contact with any body fluid from an infected animal.
- Use of personal protective equipment (PPE): particularly important for veterinarians (care, autopsies).
- Personal protective equipment in slaughterhouses or during slaughtering animal at home in the affected areas.

Consumption of products of animal origin:

- All products and tissues of animal origin as the blood, the organs (liver, kidneys, lungs) meat and milk should be thoroughly cooked before eating.

http://www.who.int/foodsafety/areas_work/food-hygiene/5keys/

- In times of epidemic, in the affected areas, sick animals should not be eaten.



Reduce the risk of transmission from mosquito to man individually and in the community :

- Through the use of Insecticide-treated bed nets (ITNs).
- Through the use of repellents if available.
- By the use of clothing in light colors (pants and long-sleeve shirts).
- By avoiding outdoor activities during the height of mosquito activity periods.

Implement an appropriate vector control program based on the results of Entomological investigations.



- No person-to-person transmission of RVF virus has been documented to date.
- Implement Standard Precautions with all patients – regardless of their diagnosis – in all work practices at all times including safe injection practices.
<http://www.who.int/csr/resources/publications/standardprecautions/en/index.html>
- Health care workers treating patient with RVF should apply extra infection control measures to prevent contact with the patient's blood and body fluids and contaminated surfaces or materials such as clothing and bedding.
http://www.who.int/csr/resources/publications/ebola/filovirus_infection_control/en/?ua=1
- Laboratory workers are also at risk. Samples taken from suspected human RVF cases for diagnosis should be handled by trained staff and processed in suitably equipped laboratories.

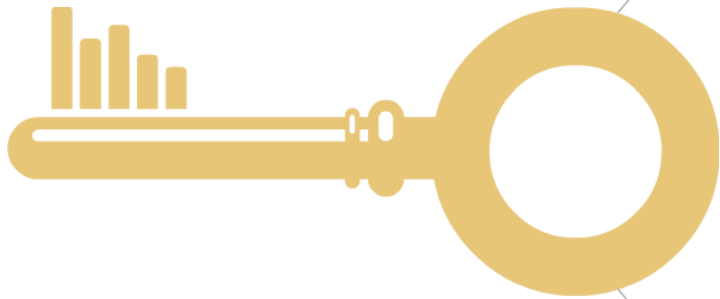


- Outbreaks of RVF in animals can be avoided if there is an ongoing mass vaccination program in place.
- Animal vaccination must be applied before the beginning of a foci to prevent an outbreak.



If an RVF animal outbreak is suspected :

- Quarantine local animals,
- Limit and/or prohibit movements of animals from affected areas to disease-free areas,
- Establish a system of active animal surveillance to serve as an early warning for veterinary and human health authorities,
- Do not vaccinate during the epizootic due to the high risk of intensifying the outbreak (animal health workers may, inadvertently, transmit the virus through the use of multi-dose vials and the re-use of needles and syringes.)



- Difficult to diagnose and to treat severe cases
- 98% cases are asymptomatic
- Multiple mosquito vectors

- Large economic impact on countries animal trade may not encourage prompt reporting
- Increased trade and travel means increased risk of outbreak

中文 **English** Français Русский Español عربي

www.who.int/emergencies/diseases/rift-valley-fever

- Technical information
- Fact Sheet
- Disease outbreak news
- Rift valley fever map
- Related links

Emergencies

Rift Valley Fever



WHO/IP. Formerly

Rift Valley Fever (RVF) is caused by a virus transmitted by mosquitoes and blood feeding flies that usually affects animals (commonly cattle and sheep) but can also involve humans. In humans the disease ranges from a mild flu-like illness to severe haemorrhagic fever that can be lethal. When livestock are infected the disease can cause significant economic losses due to high mortality rate in young animals and waves of abortions in pregnant females.

The virus was first identified in 1931 during an epidemic among sheep on a farm in the Rift Valley of Kenya. Since then, outbreaks have been reported in sub-Saharan Africa, North Africa, and in 2000 Saudi Arabia and Yemen, marking the first reported occurrence of the disease outside the African continent, raising concerns that it could extend to other parts of Asia and Europe.

Causes Symptoms Diagnosis Treatment Prevention and control



The majority of human infections result from direct or indirect contact with the blood or organs of infected animals. The virus can be transmitted to humans through the handling of animal tissue during slaughtering or butchering, assisting with animal births, conducting veterinary procedures, or from the disposal of carcasses or fetuses. Certain occupational groups such as herders, farmers, slaughterhouse workers and veterinarians are therefore at higher risk of infection.

The virus infects humans through inoculation, for example via a wound from an infected knife or through contact with broken skin, or through inhalation of aerosols produced during the slaughter of infected animals.

There is some evidence that humans may also become infected with RVF by ingesting the unpasteurized or uncooked milk of infected animals. Human infections have also resulted from the bites of infected mosquitoes, most commonly the *Aedes* and *Culex* mosquitoes, as well as from bites of hematophagous (blood-feeding) flies.

Technical information

Disease outbreak news

Rift Valley fever – Gambia
26 February 2018

Rift Valley Fever in Niger
24 November 2016

Rift Valley fever in Niger
29 September 2016

Situation updates

↓ Rift Valley Fever in Niger, situation
update
pdf, 762kb
4 November 2016

↓ Rift Valley Fever in Niger, situation
update
pdf, 777kb

Related links

-  Pandemic and epidemic diseases (PED)
-  Risk communication
-  International Health Regulations (IHR)
-  Haemorrhagic fevers



- Dr Pierre Formenty

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