



# Rift Valley fever (RVF)

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## Key facts

To better understand public health terms included in this Disease Tool (e.g. What is a case definition? or What is an infectious agent?), consult our page on [Key concepts on epidemiology](#).

## Importance

RVF is a viral zoonosis that affects mainly animals but can also cause severe disease in humans. During large outbreaks, economic losses can be significant due to the death of livestock. The virus was first identified in 1931 during an investigation into an epidemic among sheep on a farm in the Rift Valley of Kenya. Since then, Rift Valley fever (RVF) outbreaks have been reported in other parts of sub-Saharan Africa, Egypt, Saudi Arabia and Yemen. In 1997–1998, a major outbreak occurred in Kenya, Somalia and Tanzania following El Niño event and extensive flooding. Following infected livestock trade from the horn of Africa, RVF spread in September 2000 to Saudi Arabia and Yemen. RVF outbreaks in Africa are closely associated with the heavy rainfall that occurs during the warm phase of the El Niño–Southern Oscillation (ENSO) phenomenon because mosquitoes spread the zoonotic and vector-borne disease and heavy rainfall allows more mosquito eggs to hatch.

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## Case definition

A **case definition** is a set of uniform criteria used to define a disease for public health surveillance. It enables public health officials to classify and count cases consistently.

*The following are standard case definitions to allow national health authorities to interpret data in an international context. However, during an outbreak case definitions may be adapted to the local context and the Red Cross Red Crescent should use those agreed/established by national health authorities. NB: Consider that during community-based surveillance, **volunteers** should use broad (simplified) case definitions (referred to as community case definitions) to recognize most or all possible cases, provide relevant risk communication and appropriate actions and encourage them to seek care. Other actors such as **healthcare workers or investigators** studying the cause of a disease, on the other hand, can use more specific case definitions that may require laboratory confirmation.*

A suspected human case is defined as a person with febrile syndrome, either haemorrhagic syndrome (epistaxis, coughing or vomiting blood, blood in the stool, gingival bleeding, bruising) or meningoencephalitis, and probable contact with animals infected with RVF virus. A confirmed case of RVF is defined based on a positive laboratory test result.

WHO case definition source of information:

## Risk factors

- During an outbreak of RVF, close contact with animals, particularly with their body fluids, either directly or via aerosols, has been identified as the most significant risk factor for RVF virus infection.
- Unsafe consumption of fresh blood, raw milk or animal tissue. In the epizootic regions, all animal products (blood, meat and milk) should be thoroughly cooked before eating.
- People spending time in rural areas and sleeping outdoors at night in regions where outbreaks occur.
- Animal herdsmen, abattoir workers, veterinarians and other individuals who work with animals in RVF-endemic areas.
- People increase their chances of getting the disease when they visit RVF-endemic locations during periods when sporadic cases or epidemics are occurring.
- Outbreaks of RVF in animals increase when there is no sustained programme of animal vaccination.
- Laboratory workers who may be exposed to the RVF virus.
- No proper sanitation and hygiene measures while working with infected animals or cooking.

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## Attack rate (AR)

The **attack rate** is the risk of getting a disease during a specific time period (such as during an outbreak).

**Attack rates will vary from one outbreak to another. In case of an outbreak, consult the latest information provided by health authorities.**

## Groups at increased risk of severe illness (most vulnerable)

- Infants, young children.
- Elderly with weakened immune system.
- People with medical conditions such as high blood pressure, diabetes or heart disease and impaired immune systems.

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## Infectious agent

**Infectious agents** are bacteria, viruses, fungi, prions and parasites. A disease caused by an infectious agent or its toxic products is defined as an infectious disease.

*Rift Valley fever virus.*

**Vector:** Mosquitoes (commonly *Aedes* and *Culex* species - species varies by region) can host the virus and transmit it to livestock and humans.

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## Reservoir / host

A **reservoir of infection** is a living organism or material in or on which an infectious agent lives and/or usually multiplies. Reservoirs include humans, animals and the environment.

A **susceptible host** is a person at risk of being infected. The level of susceptibility depends on age, sex, ethnicity and genetic factors, specific immunity also depends on other factors that affect an individual's ability to resist infection or to limit its ability to cause infection.

A **zoonotic disease** or **zoonosis** is an infectious disease that has jumped from a non-human animal to humans.

**Zoonotic disease:** Hosts are primarily domesticated animals including cattle, sheep, camels and goats. Sheep and goats appear to be more susceptible than cattle or camels.

Humans.

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## How disease is spread (modes of transmission)

Categorisation of **modes of transmission** varies from one agency to another. In addition, some infectious agents can be transmitted by more than one mode. A list of modes of transmission can be found in the key concepts to serve as guidance to better understand the diseases included in this website.

- **Contact transmission:** Direct or indirect contact with the blood or organs of infected animals through the handling of animal tissue during slaughtering or butchering, assisting with animal births, conducting veterinary procedures, or from the disposal of carcasses or foetuses.
- **Vehicle-borne transmission:** Consuming raw or undercooked animal products of infected animals. Probably by ingesting the unpasteurized or uncooked milk of infected animals.
- **Airborne transmission:** Inhalation of *Rift Valley fever virus* that is in the air in the surroundings of infected animals or in laboratories.
- **Vector-borne:** Mosquito bite from infected mosquitoes (the dominant mosquito species varies by region).

To date, no human-to-human transmission of RVF has been documented.

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## Incubation period

This time from when infection occurs to the onset of symptoms is called the **incubation period**. It is a range of days and it can be different for each disease.

Two to six days.

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## Period of infectiousness

**Period of infectiousness** is the time interval during which an infected person can transmit the infection to other susceptible persons.

No human-to-human transmission of RVF has been demonstrated so far.

## Clinical signs and symptoms

- Starts with fever, headache, joint pain, muscle pain, sometimes neck stiffness, sensitivity to light and diarrhoea.
- Can cause blurred or decreased vision and can lead to permanent loss of vision (ocular form).
- Some patients suffer from the loss of memory, hallucinations, confusion, disorientation, vertigo, convulsions, sleepiness and coma.
- The most severe form includes rash, jaundice and bleeding from nose and gums (haemorrhagic fever form).

## Other diseases with similar clinical signs and symptoms

Malaria, West Nile virus infection, Crimean-Congo haemorrhagic fever, Hantavirus pulmonary syndrome, dengue fever, Ebola virus disease, Lassa fever, chikungunya, yellow fever, Japanese encephalitis.

## Diagnosis

- Reverse transcriptase polymerase chain reaction (RT-PCR) assay.
- IgG and IgM antibodies enzyme-linked immunosorbent assay (ELISA).
- Virus isolation by cell culture.

## Vaccine or treatment

**Please refer to the appropriate local or international guidelines for clinical management. All clinical management including the administration of any treatment should be conducted by health professionals.**

- As most human cases of RVF are relatively mild and of short duration, no specific treatment is required for these patients.

- For the more severe cases, the treatment is general supportive therapy.
- There is no vaccine against RVF for humans. However, it is possible to vaccinate animals against RVF. By preventing RVF in animals, fewer humans will be infected from mosquitoes carrying the virus or from direct contact with a sick animal.

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## Immunity

There are two types of immunity:

- **Active immunity** results when exposure to an agent triggers the immune system to produce antibodies to that disease.
- **Passive immunity** is provided when a person is given antibodies to a disease rather than producing them through his or her own immune system.

Natural infection is likely to confer long-term protection against reinfection.

## Which interventions are most effective for prevention and control?

*The following is a list of activities considered for Red Cross Red Crescent volunteers to take part in. It is not an exhaustive list of all prevention and control activities for the specific disease.*

- Communicate risks about the disease or epidemic, not only to share information on prevention and mitigation measures, but also to encourage informed decision-making, positive behaviour change and maintenance of trust in the Red Cross Red Crescent response. This includes the identification of rumours and misinformation around disease—frequent during health emergencies—to manage them appropriately. Volunteers should use the most context-appropriate communication techniques (ranging from social media to face-to-face interactions).
- Community education and engagement activities to encourage the adoption of protective behaviours:
  - Thoroughly cook/heat all animal products (blood, meat and milk) before consuming.
  - Safe handling of sick animals (e.g. practising hand hygiene, wearing gloves and other appropriate individual protective equipment).
- Animal vaccination is the most effective way to prevent RVF outbreaks in areas where the disease is endemic. However, vaccination should not be done once the outbreak is ongoing because of a risk of intensifying the outbreak (e.g. during mass vaccination campaigns in case of re-use of needles or by transmission to non-infected animals from infected animals that may not be displaying signs of illness).
- Livestock quarantine, restricting the movement of livestock and slaughter bans are most effective during the pre-outbreak and outbreak phases.

### Which interventions have NO evidence and therefore are NOT recommended?

- Bed nets are an effective way to prevent mosquito bites; but for Rift Valley fever, the disease is not only vector-borne but primarily transmitted through contact with body fluids of infected livestock and through the consumption of infected animal products. Therefore, the interventions need to tackle all the different modes of transmission. Additionally, some mosquitoes like the *Aedes* species bite during the day and

therefore bed nets during the night will not be the most effective preventive measure.

- Safe and dignified burials using full personal protective equipment (PPE) and other infection control prevention methods (as for Ebola interventions) are not necessary as there is no human-to-human transmission documented.
- Ultra-low volume insecticide spraying has a limited effect on RVF transmission rates.

## Epidemic characteristics and RCRC indicators and targets

The first table below includes data that should be gathered from health authorities and relevant non-governmental actors to understand the progress and characteristics of the epidemic in the specific country and area of intervention. The second table includes a list of suggested indicators that can be used for monitoring and evaluating Red Cross Red Crescent activities; wording of indicators may be adapted to specific contexts. Target values for a specific indicator can vary widely from one context to another and therefore managers should define them based on the specific population, area of intervention and programmatic capacity. Exceptionally, some indicators in this website may include target values when these are globally agreed as a standard; e.g. 80 per cent of individuals who slept under an insecticide-treated net (ITN) the previous night—the normative World Health Organization benchmark for universal coverage with ITNs.

Epidemic characteristics and progression
Cases per week
Case fatality rate
Attack rate (population)
Indicators for Red Cross Red Crescent activities
Number of volunteers trained on a specific topic (e.g. Epidemic Control for Volunteers (ECV); Community-based surveillance (CBS); WASH training; CBHFA training, etc.) <b>Numerator:</b> Number of volunteers trained Source of information: Training attendance sheets
Suspect cases detected by volunteers who were encouraged to seek healthcare and who arrived at a health facility (NB. This indicator requires the implementation of a system in collaboration with the health facility, whereby health workers specifically asked the patient how they heard about the service) <b>Numerator:</b> RVF suspect cases detected by volunteers in a determined period preceding this survey (e.g. two weeks) for whom advice or treatment was sought from a health facility <b>Denominator:</b> Total number of people who are RVF suspect cases in the same period preceding the survey Source of information: Survey

## Indicators for Red Cross Red Crescent activities

Percentage of people recognizing at least one transmission route and at least one measure for preventing it

**Numerator:** Total number of people who cited at least one transmission route and at least one measure for preventing it during the survey

**Denominator:** Total number of people surveyed

Source of information: Survey

Percentage of people who know the cause, symptoms, treatment or preventive measures

**Numerator:** Number of people who cite the cause, symptoms, treatment or preventive measures

**Denominator:** Number of people surveyed

### See also:

- For Community Engagement and Accountability (CEA) indicators for activities accompanying ECV actions, please refer to: IFRC *CEA toolkit (Tool 7.1: Template CEA logframe, activities and indicators)*. Available at: <https://www.ifrc.org/document/cea-toolkit>

## Impact on other sectors

Sector	Link to the disease
<b>WASH</b>	The virus is transmitted by contact with and consumption of blood, meat, milk or organs of infected animals. This can be decreased through proper hygiene and sanitation measures while handling infected animals. As the virus is also transmitted through bites from infected mosquitoes, adequate environmental hygiene with water and waste management is important to reduce mosquito breeding sites, especially in rainy seasons or flood disasters.
<b>Food security</b>	Humans may be infected by ingesting the unpasteurized or uncooked milk of infected animals and by unsafe consumption of fresh blood or animal tissue. In the epizootic regions, all animal products (blood, meat, and milk) should be thoroughly cooked before eating.
<b>Nutrition</b>	Malnutrition increases the risk for severe Rift Valley fever.
<b>Shelter and settlements (including household items)</b>	People working in rural areas and sleeping outdoors are at increased risk of RVF. Mosquito nets and different household actions like screening in homes and covering water containers are a good prevention strategy to decrease the transmission of RVF virus from mosquitoes to humans.

Sector	Link to the disease
<b>Psychosocial support and mental health</b>	RVF can have several negative impacts on psychological, social and emotional aspects of a person's life, apart from its physical effects only. Psychological reactions may include fear of social stigma, anxiety and worry about the outcome as the clinical course of the disease is so variable. The ocular form that might lead to permanent loss of vision is particularly affecting people's life after acute disease recovery and people might need psychosocial support.
<b>Education</b>	<p>If kindergartens and schools do not have the appropriate equipment, such as window and door screens, mosquito nets for naps or covered water containers, the risk of infection is greater. Children may then be at risk of getting the disease if attending classes, or at risk of losing out on education if staying at home because of illness.</p> <p>Schools and other facilities dedicated to children and youth can offer an important space for them to engage, mobilize and raise awareness around health education issues. With support, trust and appropriate capacity-building, young people can be effective advocates for the adoption of preventive measures during an epidemic and are those best placed to mobilize their peers.</p>
<b>Livelihoods</b>	<p>People working with livestock like animal herdsman, farmers, abattoir (slaughterhouse) workers or veterinarians are at higher risk to get RVF. Illness leads to reduction in productivity as these people may not be able to work due to severe forms of the disease. This can lead to a loss of income due to the reduction in work activity and to the diversion of resources to seek medical treatment.</p> <p>Permanent loss of vision is in many countries an essential threat to the livelihood of the affected person and whole families.</p> <p>Vaccination of the livestock protects the animals that the people rely on for food and as a source of income.</p>

## References :

- WHO (2018) *Rift Valley fever. Fact sheet*. Available at: <https://www.who.int/news-room/fact-sheets/detail/rift-valley-fever>