


## Rift Valley Fever: The story unfolds...

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<h1>Post Card</h1>	
<p>20 December 2007</p> <p>Dear Mum and Dad</p> <p>It is very cold these days in England. I hear it is very hot for winter-time in Sudan. Happy Eid-ul-Adha. It feels very strange this year that I am slaughtering for you here in the UK. Usually you slaughter for me in Sudan. I am very worried about you, especially when you said you felt like you had flu... Do you know if there are any cases who got the illness in Khartoum? I hope this outbreak is over soon. All my love</p> <p>XXXX</p>	 <p>To: <u>Family in Sudan</u></p> <p><u>XXXXXXXXXXXXXX</u></p> <p><u>P O Box xxxxx</u></p> <p><u>Khartoum, Sudan</u></p>

### Introduction

#### What is Rift Valley Fever?

Rift Valley Fever (RVF) is an insect-borne disease of man and animals caused by a member of the Phlebovirus genus, one of the five genera in the family Bunyaviridae.

#### *RVF in humans*

Uncomplicated RVF in man characteristically manifests as an acute influenza-like illness with transient fever, rigor (shivering), headache, severe muscle and joint pain, photophobia and anorexia sometimes with a petechial rash, nausea, vomiting and epistaxis. The course is 4 to 7 days leading to full recovery in 2 weeks. The most frequent complication is retinitis, usually bilateral, occurring 1 to 3 weeks after the primary febrile illness.

It is normally a mild disease with a fatality rate of around 1 percent. But in patients who develop the

hemorrhagic fever form, the fatality rate is at around 50 percent. There is no treatment for the disease, which is spread to humans mostly through contact with the blood and organs of infected animals or from bites of infected mosquitoes.

#### *RVF in animals*

Infection is more common than severe disease – it is often mild or sub-clinical. Most, if not all, infected pregnant sheep, goats, cattle and camels abort affected fetuses at any stage of gestation. When an epizootic occurs in animals it is easily transmitted to humans leading to an epidemic.

#### How is RVF transmitted?

##### *Vector transmission*

Aedes mosquito is the usual vector. But during epizootics, the large number of cattle/sheep with a virus facilitates transmission by other mosquitoes as secondary vectors – Culex and Anopheles. Wind-

borne dispersal of infected mosquitoes could provide a mechanism for the extension of RVF outbreaks in sub-Saharan Africa.

*Non-vector transmission*

Non-vector transmission of RVF virus is not considered to be important in livestock. The risk of human-to-human infection through direct contact appears also to be very low. However, in addition to mosquito transmission, humans are easily infected by contact with the body fluids of infected animals through contact with abraded skin, wounds or mucous membranes or by inhalation of aerosols generated. Thus, the slaughter of infected animals, necropsy procedures and laboratory manipulation

of tissues and isolated viruses are activities carrying a high risk of disease transmission.

**Recent outbreaks**

The virus was first identified in 1931 during an investigation into an epizootic among sheep on a farm in the Rift Valley of Kenya. Since then, outbreaks have been reported in sub-Saharan and North Africa. In 1997-98, a major outbreak occurred in Kenya, Somalia and Tanzania and in September 2000, RVF cases were confirmed in Saudi Arabia and Yemen, marking the first reported occurrence of the disease outside the African continent and raising concerns that it could extend to other parts of Asia and Europe.

- RVF outbreaks are not limited to Africa

Date	Country	Cases	Deaths	Provinces
23 Oct 2000	Saudi Arabia	443	85	Jizan, Asir
19 Oct 2000	Yemen	653	80	Hodeidah, Hajjah, Mahweet and Sadeh Dhamar

- Outbreaks happen periodically usually in 5-20 year cycles..

Date	Country	Cases	Deaths	Provinces
2006	Kenya	684	155	North Eastern Province, Rift Valley Province, Coast Province, Central Province, and Eastern Province.

- It has been seven years since the Saudi/Yemen outbreak, and 10 years since the 1997-98 outbreak in the region.
- Outbreaks know no country boundaries

Date	Country	Cases	Deaths	Provinces
19 Dec 2006 to 20 Feb 2007	Somalia	114	51	Lower Juba, Gedo, Hiran, Middle Juba, Middle Shabelle, and Lower Shabelle
13 Jan to 3 May 2007	Tanzania	264 severe cases	109	Ten out of 21 regions

- The disease jumps from Kenya to Somalia and Tanzania

**Media Box**

The death toll from a major outbreak of Rift Valley Fever in Kenya has risen to 139 and the highly-contagious disease has spread to neighbouring Tanzania, authorities said on Tuesday.

Some cases have been found across Kenya's northern border in Somalia. Health officials in Tanzania, to the south of Kenya, confirmed on Tuesday they had registered the first two cases of Rift Valley Fever in nearly a decade.

**Reuters, Feb 6, 2007**

- Outbreaks know no boundaries – the disease jumps to Sudan:

Date	Attack rates *	Cases	Deaths	Provinces
18 Oct to 2 Nov 2007	125 in 16 days 7.8/day	125	60 3.75/day Case fatality 48%	10 localities of White Nile, Sinnar and Gezira States
7 Nov	103 in 5 days 20.6/day	228	84 4.8/day Case fatality 37%	15 localities of White Nile, Sinnar and Gezira States
14 Nov	101 in 7 days 14.4/day	329	96 1.7/day Case fatality 29%	Gezira accounts for more than half cases. Cases in Khartoum were imported not indigenous.
21 Nov	122 in 7 days 17.4/day	451	164 9.7/day Case fatality 36%	Gezira 60% of cases, 61% deaths
19 Dec	181 in 28 days 6.5/day	632	218 1.9/day Case fatality 34%	New cases in River Nile State. Gezira accounts for 64% cases, 68% deaths
Jan 2008	Not available	Awaiting official update		

- Calculated from WHO press releases

#### Media Box

The United Nations health agency said two weeks ago that it was investigating a deadly outbreak in Sudan suspected to be yellow fever, but laboratory tests have shown it was Rift Valley Fever, WHO spokesman John Rainford said "There are 125 human cases and 60 deaths," he told Reuters.

The nearly 50 percent fatality rate was "very high" compared to the usual expectations for Rift Valley Fever, but it was likely that many more mild cases have not been detected in Sudan, according to Rainford "The Sudanese government has been highly cooperative and transparent in sharing information," Rainford said.

Reuters, November 2, 2007

#### Further reflections on the current outbreak in Sudan

##### How can we keep track of the epidemic as it unfolds?

Continued monitoring and reporting of cases and deaths is vital among humans. Any new cases should be reported and enhanced surveillance to be in place all over the country. This is also coupled to surveillance among animals – suspected animal cases to be reported to veterinary authorities. The epidemic control therefore needs a multi agency approach between veterinary and health authorities. Official press releases need to continue to so that professionals and the public are updated frequently as the epidemic unfolds.

##### Is the decline in cases since 21 November real?

A decline in attack rates could occur if there are changes in case definitions or changes in case ascertainment or reporting. The attack rate declined from 17.4 per day to 6.5 per day after 21 November. As the case fatality rate remained at 34%, this indicates there has been no change in the

severity of cases being reported or the case definitions. This does seem to indicate therefore that the decline in cases is real.

To our knowledge cases have continued in the latter end of December. We await official reports for 20 Dec to January with interest... We would expect the worst to be over by end January, as Eid-ul-Adha on 20 Dec would have been the worst (most favourable for transmission).

##### Why would the decline in attack rates happen?

The decline in attack rates could happen naturally due to herd immunity in animals, but mainly due to effective control methods. Herd immunity levels are high in animals after epidemics, and this appears to be life-long. In humans, immunity develops in the mild cases and asymptomatic cases but not enough to get herd immunity.

Attack rates in humans therefore decline due to effective control methods – vector control and personal protection. With no specific treatment and no effective human vaccine, intensive social mobilisation is needed to raise awareness of the risk

factors of RVF infection and the protective measures individuals can take to prevent exposure. Medical professional awareness is essential to be kept fully informed and to be aware of signs and symptoms and to pick any suspected cases that are to be notified to the Ministry of Health or epidemic control team. This facilitates early detection of cases and surveillance of the epidemic.

Public awareness programmes are essential to keep the public fully and accurately informed, not only to reduce concern but also to assist in recognition of disease cases. A social mobilisation leaflet was designed in Arabic and issued on 14 November [See Appendix]. It is likely that this formed an effective part of the control measures.

#### **How can we prevent transmission in other parts of the country?**

Quarantine and movement controls - Immediately on suspicion of the disease, an infected area should be designated extending at least 10 km from known infected animals. The area at risk is also determined with respect to geographical features, prevailing winds, the presence of possible vectors and the density of prospective hosts. Movements of animals in and out of the area are prohibited.

Vector control – Aerial or ground ultra low volume application of insecticides or thermal fogs or mists generated on the ground could be considered. Treatment of livestock with a systemic insecticide or a topical insecticide over a wide area could assist in reducing the populations of potential vectors. Personal protection measures and social mobilisation should take place in outbreak zones to reduce transmission and in other areas to prevent transmission.

*Vaccinating animals during an epizootic is contraindicated.* There is a risk attached to vaccinating animals during an epidemic. Staff may unwittingly spread the infection through the use of multi-dose vials and the re-use of needles and syringes. If some of the animals in the herd are already infected and viraemic (although not yet displaying obvious signs of illness), the virus will be transmitted among the herd, and the outbreak will be amplified. Therefore, a decision to vaccinate animals in apparently disease-free areas adjacent to the epidemic is a risky decision that could backfire.

#### **Media Box**

The Ministry of Animal Resources in the Government of South Sudan (GOSS) has ordered about one hundred thousand doses of vaccine to treat the Rift Valley Fever disease in the south. Speaking to Miraya FM, the director of Disease and Vector control in the Ministry of Animal Resources, Dr. Jacob Aorok, said the ministry has deployed senior animal healthy experts in Renk County in the Upper Nile State to work with local veterinary personnel to monitor the disease.

He said that two are suspected to have died from the disease in Renk town. "We'll not do the mass vaccination for all the southern Sudan but we will just focus on Renk because Renk is adjacent to the White Nile," Dr. Aorok said. He said that they want to create a buffer zone "we want to prevent the spread of the disease to southern Sudan," said Dr. Aorok.

**Miraya 101 FM, 24 November 2007**

[http://www.mirayafm.org/news/news/\\_200711242105](http://www.mirayafm.org/news/news/_200711242105)

#### **How would we know when the outbreak is over?**

We would expect a rise in cases following Eid. If there is no rise in cases, deaths or attack rates following Eid, this indicates control measures are effective. If the decline continues as in 21 Nov to 19 Dec, this would indicate that the outbreak is

nearly over – providing transmission does not occur in other parts of the country.

The incubation period of Rift Valley Fever ranges between two to six days. In a common source outbreak, the outbreak would be officially over when there are no cases in at least 3 times the mean incubation period – roughly 18 days for RVF.

However, this is not a common source outbreak, and it is important not to prematurely declare an outbreak over and allow for any delays in reporting. Once the multi-agency control team are satisfied that there have been no new cases in the requisite number of days, they need to officially declare the outbreak over in a statement to the Press, and in an outbreak report. The team should also be satisfied that there are no new animal cases or extension of the outbreak to other areas of the country.

#### **Can another outbreak occur in the near future?**

Epidemics of RVF occur in 5-20 year cycles in most of eastern and south Africa. In between epidemics, the viruses persist in eggs of the Aedes mosquito which can survive for long periods, possibly several seasons, in dried mud. Outbreaks of RVF occur generally when particularly heavy, prolonged and, often, unseasonal rainfall favours the breeding of mosquito vectors.

#### **How can we reduce the risk of another outbreak or pick it up early?**

Epidemics of RVF occur at long, irregular intervals of many years and outbreaks tend to occur simultaneously across an extensive area. This makes it difficult to advocate, and justify the expense of, repeated prophylactic vaccination of susceptible livestock during the long inter-epidemic periods. Surveillance of vegetation and insect populations is beneficial, linked to standard malaria control – a much commoner illness. Surveillance among animals should take place to pick up the start of an epizootic. During this current outbreak in Sudan, it was the epidemic which alerted to the existence of the epizootic. This is understandable as the disease is usually mild or asymptomatic in animals. However, abortions should ring alarm bells...

#### **Media Box**

Sudan on Saturday denied there were any confirmed cases of Rift Valley Fever in animals, after almost 250 human cases were recorded with a death rate of about 30 percent.

The disease could devastate livestock in the country where much of the population relies heavily on cattle farming. But Sudan's minister for animal resources said there were no clinical signs of the virus.

**Reuters 10 November 2007**

#### **The economic impact of the outbreak**

##### **Costs of outbreak control**

The cost of outbreak control could be substantial. This cost would be borne by the Ministry and local agencies as well as aid and international donors.

#### **Media Box**

The World Health Organization (WHO) is launching an appeal for US\$ 975 000 to support international efforts to control and prevent Rift Valley Fever (RVF) in Yemen.

This viral haemorrhagic fever causes severe disease amongst both humans and animals, posing a serious public health risk and economic losses due to loss of livestock.

In particular, the economic impact of the restriction on animal movement and trade is causing severe hardship amongst local inhabitants.

**WHO Press Release, 9 October 2000**

##### **Costs to local economy**

Rift Valley Fever affects sheep, goats, cattle and camels and could have a devastating impact on trade and the rural economy. This cost would be

borne by the local communities who would suffer losses both in livestock and sales.

#### **Media Box**

The spread of Rift Valley Fever (RVF) in Sudan could escalate in the coming weeks as millions of animals are moved around the country and the region for the Eid Al Idha Muslim holiday, to be celebrated around 20 December, FAO warned today.

FAO has offered to send a team of animal health experts to the Sudan for in-depth field investigations. "We are ready to assist the veterinary authorities in developing a comprehensive monitoring and control programme," said FAO Chief Veterinary Officer Joseph Domenech. "FAO could also assist in improving border quarantine and laboratory facilities for monitoring livestock exports."

In response to recent RVF outbreaks, Egypt and Saudi Arabia have banned livestock imports from Sudan.

FAO Newsroom, 23 November 2007

### Other costs

Other costs also occur. These would be borne by consumers of meat and dairy products. The

substantial loss would be to the government and people of Sudan as it is unknown when the ban on Sudan livestock exports is likely to be lifted.

### Media Box

Jeddah - Sheep prices have shot up ahead of the Hajj sacrificial rite and Eid. The price hike is because of an import ban on livestock from Sudan where there is an outbreak of Rift Valley.

The ban on imports from Sudan includes refrigerated, frozen and canned meat.

Saudi Gazette 14 December 2007

### The story continues...

At the time of writing, the outbreak is ongoing in the Sudan. An official update from WHO is expected (perhaps on 16 January 2008 – four weeks from the last update on 19 Dec 2007). It is unlikely that the next update will declare the outbreak over as Sudan needs to be disease-free for at least 18 days.

The next 'Post Card from UK' to this journal will reflect on outbreak management and control, surveillance, multi-agency working, and communication.

Post cards from the UK to family in Sudan continue.

### Bibliography and resources on the internet

FAO Rift Valley Fever Manual- Emergency Preparedness Planning

(<http://www.fao.org/ag/AGa/Agah/empres/Info/rvf/RVF198.htm>)

WHO Rift Valley Fever fact sheet (<http://www.who.int/mediacentre/factsheets/fs207/en/>)

WHO Disease outbreak news (<http://www.who.int/csr/don/en/>)

RVF Social mobilisation leaflet [Arabic] ([http://www.who.int/csr/disease/riftvalleyfev/RVFI\\_eafletFMOH.pdf](http://www.who.int/csr/disease/riftvalleyfev/RVFI_eafletFMOH.pdf))

The image shows four informational leaflets in Arabic. The first leaflet, titled 'ما يجب معرفته عن حمى الوادي المتصدع', discusses the transmission of the disease from animals to humans and vice versa, and lists symptoms like fever, muscle pain, and vomiting. The second leaflet, 'الوقاية', provides instructions on how to handle animal carcasses and meat safely. The third leaflet, 'تذكير', serves as a reminder about the disease's symptoms and the importance of reporting cases. The fourth leaflet, 'مرحلة المضاعفات', describes the severe complications that can arise, such as encephalitis and hemorrhagic fever. All leaflets feature the logos of the Sudanese Ministry of Health and the World Health Organization (WHO).