

# **Viral Hemorrhagic fevers**

**Julius Oyugi, PhD**

**Dept of Medical Microbiology**

**University of Nairobi**

# VIRAL HEMORRHAGIC FEVER WHAT IS IT?

an acute viral infection causing:

- Diffuse vascular damage
- Hemorrhage
- Multisystem compromise
- Relatively high mortality

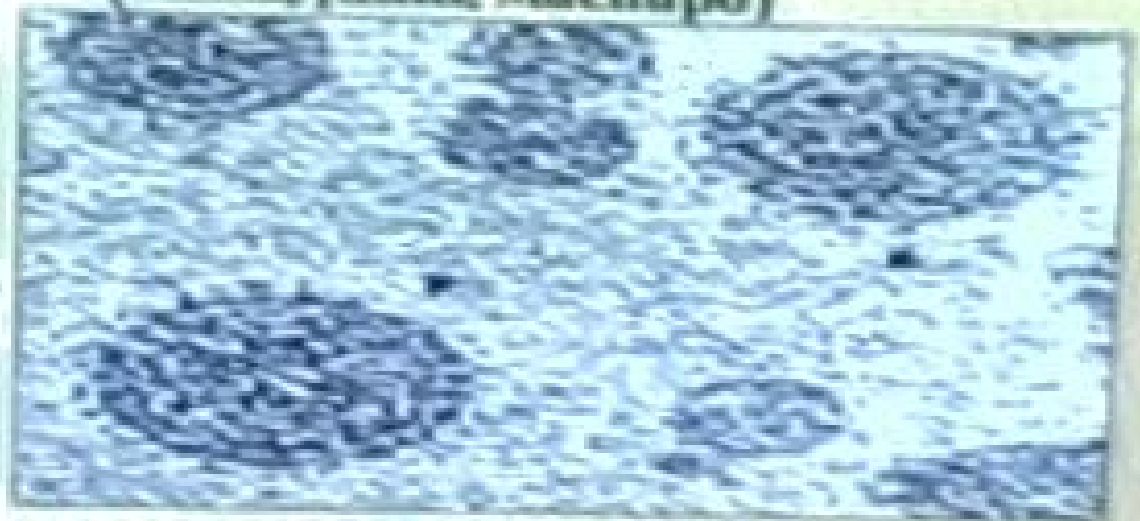


# Examples of VHF

Family: *Flaviviridae*  
(dengue, yellow fever)



Family: *Arenaviridae*  
(Lassa, Junin, Machupo)



Family: *Filoviridae*  
(Ebola, Marburg)



Family: *Bunyaviridae*  
(CCHF, RVF, Hantaviruses)



## Common Features of VHF

- They are all RNA viruses and are enveloped.
- Their survival is dependent on an reservoir host.
- They are geographically restricted to areas where their host species live.
- Human outbreaks occur sporadically and irregularly.
- With few exceptions, there is no cure or established drug treatment for VHEs.

## Clinical Picture of HFV

**Initial symptoms:**

- High fever
- Headache
- Fatigue
- Abdominal pain
- Myalgia [Muscle pain]



## 2: More severe clinical presentation

Bloody diarrhea

Generalized mucous  
membrane hemorrhage

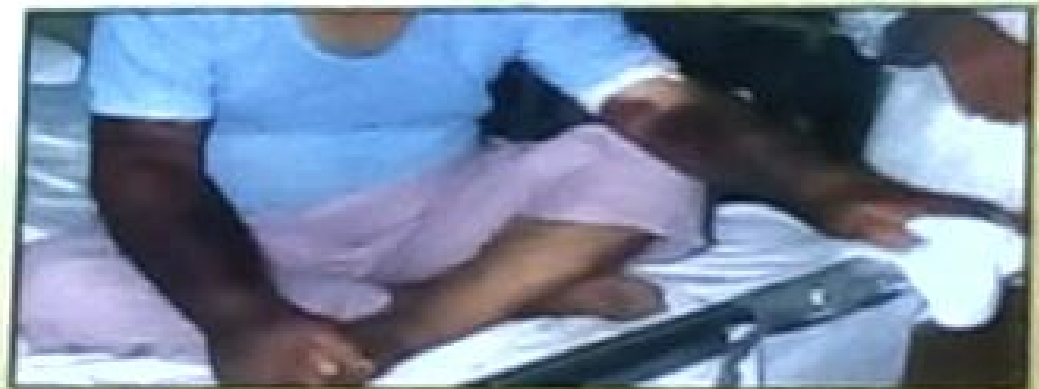
Rash

Altered mental status.

Cardiovascular collapse



Ocular manifestations of VHF.



Massive cutaneous ecchymosis

## Family: Flaviviridae

The Flaviviridae are a family of positive, single-stranded, enveloped RNA viruses.

They are found in arthropods, (primarily ticks and mosquitoes), and can occasionally infect humans.

### Examples

- Dengue fever virus.
- Yellow fever virus.
- West Nile viruses.
- Japanese encephalitis



# DENGUE FEVER VIRUS (DFV)

There are four different Dengue virus serotypes namely: DEN 1, DEN2, DEN3 and DEN4.

Main hosts: non human primates

2.5 billion individuals at risk of infection with DFV.

40-80 million infected each year with thousands of deaths



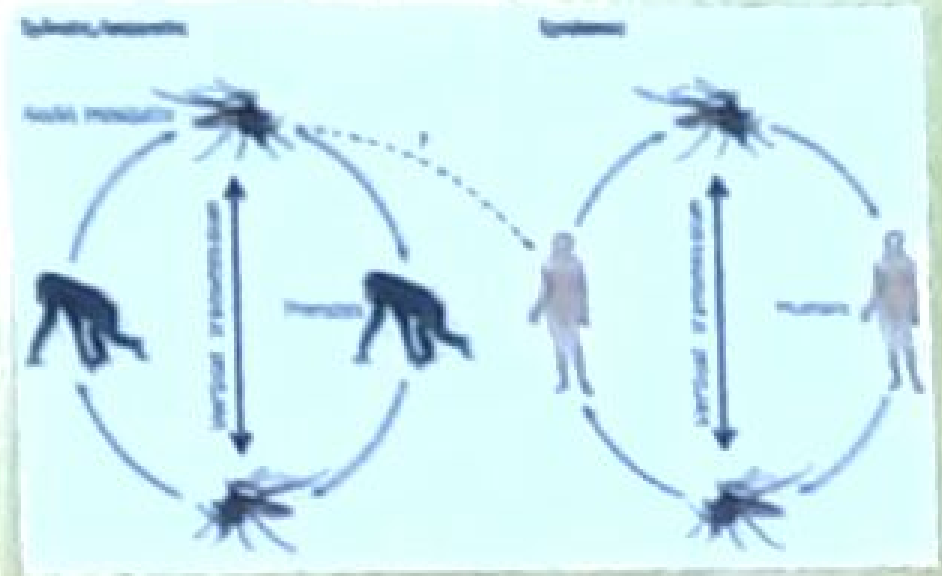


## TRANSMISSION OF DFV

Human-to-human transmission through *Aedes* spp.

Once infected, a mosquito remains infected for life.

Infected mosquitoes can also transmit the virus by trans-ovarian mode.



## **Clinical manifestations**

Dengue fever (DV) is a febrile illness associated with headache, bone, muscle and joint pain, rash and leucopenia.

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- ❑ Dengue Hemorrhagic fever(DHF): is characterized by four symptoms: High fever, hemorrhagic phenomena and signs of circulatory failure. Such patients may develop Dengue shock syndrome (DSS).

## **Treatment**

- The major pathophysiological abnormal changes associated with DHF/DSS is an acute increase in vascular permeability leading to loss of plasma.
- Treatment is by early and effective replacement of plasma expander and electrolytes.

# YELLOW FEVER VIRUS

YF is an acute viral hemorrhagic disease.

Up to 50% of severely affected persons without treatment will die from YF.

An estimated 200 000 cases of YF, causing 30 000 deaths, worldwide each year.

The virus is endemic in tropical areas of Africa and Latin America, with a combined population of over 900 million people.

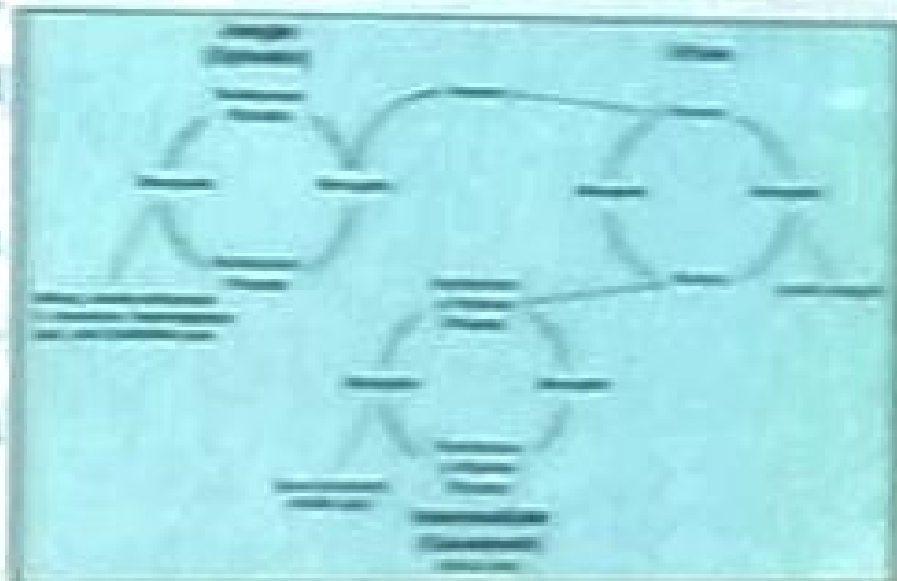


## TRANSMISSION OF YELLOW FEVER VIRUS

Sylvatic (or jungle) yellow fever:

Incurs in monkeys, mosquitoes and humans.

Intermediate yellow fever: Occurs in semi-humid parts of Africa. Semi-domestic mosquitoes infect both monkeys and humans.



Urban yellow fever: Infected people introduce the virus into densely populated areas with a high number of non-immune people and Aedes mosquitoes. Infected mosquitoes transmit the virus from person to person.

## CLINICAL DIAGNOSIS

The incubation: 3 to 6 days, followed by infection that can occur in one or two phases.

"acute phase"; Fever, muscle pain, headache, shivers, loss of appetite, and nausea or vomiting. Most patients improve and their symptoms disappear after 3 to 4 days.

"toxic phase" (15% of patients enter a second) within 24 hours. High fever returns accompanied by jaundice, abdominal pain, vomiting and hemorrhage.  $\frac{1}{2}$  of the patients die within 10 to 14 days.

## **Treatment of yellow fever**

There is no cure for yellow fever.

Treatment is symptomatic, aimed at reducing the symptoms for the comfort of the patient.

## **Prevention of infection with YF**

### **vaccination**

The yellow fever vaccine is safe and affordable, providing effective immunity against yellow fever within one week for 95% of those vaccinated.

A single dose provides protection for 30–35 years or more, and probably for life.



### **People who should not be vaccinated include.**

- Children aged less than 9 months.
- Pregnant women.
- People with severe allergies to egg protein.
- People with severe immunodeficiency.

### **4. Mosquito control**

The risk of yellow fever transmission in urban areas can be reduced by;

- Eliminating potential mosquito breeding sites
- Use of mosquito nets.

# Bunyaviridae

- Crimean Congo hemorrhagic fever virus (CCHFV).
- Rift Valley Fever virus (RVFV).
- Hantaviruses.

## FILOVIRIDAE

- Marburg virus.
- Ebola virus.

## MARBURG OUTBREAKS

Year(s)	Country	Apparent or suspected origin	Reported number of human cases	Reported number (%) of deaths among cases	Situation
1967	Germany and Yugoslavia	Uganda	31	7 (23%)	Simultaneous outbreaks occurred in laboratory workers handling African green monkeys imported from Uganda. In addition to the 31 reported cases, an additional primary case was retrospectively serologically diagnosed.
1980	Kenya	Kenya	2	1 (50%)	Recent travel history included a visit to Kitum Cave in Kenya's Mount Elgon National Park. Despite specialized care in Nairobi, the male patient died. A doctor who attempted resuscitation developed symptoms 9 days later but recovered.
1987	Kenya	Kenya	1	1 (100%)	A 15-year-old Danish boy was hospitalized with a 3-day history of headache, malaise, fever, and vomiting. Nine days prior to symptom onset, he had visited Kitum Cave in Mount Elgon National Park. Despite aggressive supportive therapy, the patient died on the 11th day of illness. No further cases were detected.

# WHAT'S EBOLA?

- ↳ Ebola is the most lethal virus known to man.
- ↳ It kills 50 to 90 percent of the infected persons.
- ↳ Outbreaks occurred all over central Africa.

## Classification

4 types of Ebola viruses:

- Ebola-Zaire
- Ebola-Sudan
- Ebola-Ivory Coast
- Ebola-Reston- America, no signs of disease

# ROUTES OF TRANSMISSION: FILOVIRUSES

Reservoir is UNKNOWN

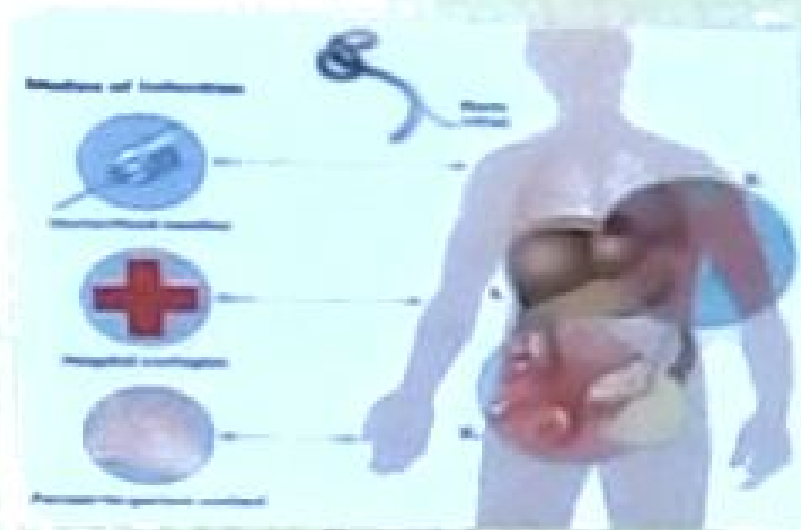
- Bats implicated with Marburg

Intimate contact.

Nosocomial transmission

- Reuse of needles and syringes

- Exposure to infectious tissues, excretions, and hospital wastes



# CURES AND TREATMENTS

There is no cure for Ebola.

Due to the extreme biohazard, doctors must wear Level 4 containment suits. They are the equivalence of a spacesuit.

Some poor African towns put the diseased in a straw hut, and then burn it down when they're dead. Simple yet effective.

# CONTROLLING THE SPREAD OF EBOLA

- Hospitals must follow precautionary methods, such as:
  1. wearing gloves
  2. isolating infected individuals
  3. practicing nurse barrier techniques
  4. proper sterilization and disposal of all equipment
- Burials must be done correctly
  1. no washing or touching carcass
  2. put into body bags and bury outside city.
- Report any questionable illness to officials



## Protective clothing

Disposable gowns, gloves, masks and shoe covers, protective eyewear when splashing might occur, or if patient is disoriented or uncooperative .

