

4. Marburg Virus – Science & Technology

WHO confirmed Ethiopia's first outbreak of Marburg Virus Disease (MVD). WHO confirmed Ethiopia's first outbreak of Marburg Virus Disease (MVD), a highly fatal hemorrhagic fever caused by the Filovirus family (similar to Ebola), transmitted via fruit bats and human fluids, with no approved vaccine currently available.

1. Current Context

Event – The World Health Organization (WHO) has officially confirmed Ethiopia's first-ever outbreak of Marburg Virus Disease (MVD).

2. Disease Profile & Overview

Definition – MVD is a severe, highly fatal viral hemorrhagic fever.

Causative Agents – It is caused by two specific viruses under the genus *Orthomarburgvirus marburgense* –

1. Marburg virus (MARV)
2. Ravn virus (RAVV)

Taxonomy – It belongs to the Filoviridae family (Filovirus).

Clinical Similarity – It is clinically indistinguishable from the Ebola virus disease (both are filoviruses).

Case Fatality Ratio (CFR) – The fatality rate varies significantly from 24% to 88%.

Determinants – The variation depends on the virus strain involved and the quality/accessibility of case management during the outbreak.

3. History & Origin

First Identification – The disease was first recognized in 1967 during simultaneous outbreaks in Marburg and Frankfurt (Germany) and Belgrade (Serbia).

Initial Source – The 1967 outbreak was linked to laboratory work using African green monkeys (*Cercopithecus aethiops*) imported from Uganda.

Geographical Spread – Subsequent outbreaks have been reported across Africa, including Angola, Democratic Republic of the Congo, Ghana, Kenya, South Africa, Uganda, and Tanzania.

4. Modes of Transmission

Transmission Type	Source / Mechanism	Key Details
Animal-to-Human (Zoonotic)	<i>Rousettus aegyptiacus</i> (Fruit Bats)	Infection occurs through prolonged exposure to mines or caves inhabited by these bat colonies (the natural hosts).
Human-to-Human	Direct Contact	Spreads via direct contact (broken skin/mucous membranes) with blood, secretions, organs, or bodily fluids of infected people.
Contaminated Objects	Fomites	Contact with surfaces and materials (e.g., bedding, clothing) contaminated with these fluids.
Iatrogenic	Medical Procedures	Transmission via contaminated injection equipment or needlestick injuries (often associated with more severe disease).

Infectivity Note – Individuals are not infectious until they develop symptoms.

High-Risk Groups – Healthcare workers (treating patients), Caregivers at home, Family members participating in unsafe burial ceremonies (involving direct contact with the body).

5. Clinical Presentation (Symptoms)

Incubation Period – Ranges from 2 to 21 days.

Phase I – Sudden Onset (Early Symptoms) –

1. High fever.
2. Severe headache.
3. Severe malaise (fatigue).
4. Muscle aches and pains.

Phase 2 – Severe Hemorrhagic Phase (Between Day 5 and 7) – Many patients develop severe hemorrhagic manifestations.

Fatal Outcomes – In fatal cases, death usually occurs between 8 and 9 days after symptom onset.

Cause of Death – Usually preceded by severe blood loss and shock.

6. Diagnosis & Challenges

Differential Diagnosis Difficulty – It is clinically difficult to distinguish MVD from other tropical febrile illnesses.

Confusers – Malaria, typhoid fever, shigellosis, meningitis, and other viral hemorrhagic fevers (like Ebola or Lassa fever).

Laboratory Confirmation Methods –

1. Enzyme-linked immunosorbent assay (ELISA).
2. Antigen detection tests.
3. Serum neutralization tests.
4. Reverse transcriptase polymerase chain reaction (RT-PCR).
5. Virus isolation by cell culture.

Safety Protocol – Patient samples are an extreme biohazard risk; laboratory testing requires maximum biological containment conditions and triple-layer packaging for transport.

7. Treatment & Vaccine Status

Current Status – There are no approved vaccines or antiviral treatments specifically for MVD.

Patient Management –

1. Relies entirely on supportive care.
2. Includes rehydration (oral or intravenous fluids).
3. Maintenance of electrolyte balance.
4. Treatment of specific symptoms (pain, fever).

Future Prospects – Several monoclonal antibodies (mAbs), antivirals, and vaccine candidates are currently under development and ready for clinical trials.

8. Prevention & Control Strategies

Community Engagement – This is the cornerstone of successfully controlling outbreaks.

Core Interventions –

1. **Surveillance** – Rapid identification and isolation.
2. **Contact Tracing** – Monitoring those exposed.
3. **Laboratory Support** – Quick confirmation.
4. **Safe Burials** – Ensuring dignity while preventing transmission from deceased bodies.
5. **Social Mobilization** – Educating the public on risks.

Risk Reduction Measures –

Wildlife – Avoid prolonged exposure to fruit bat colonies in caves/mines.

Protective Gear – Wear gloves and protective clothing during close contact with patients or wildlife.

Hygiene – Regular hand washing and safe injection practices.

Source – <https://ddnews.gov.in/en/ethiopia-reports-nine-cases-of-marburg-virus-disease-in-first-ever-outbreak-who/>