

# Hemorrhagic Fever Virus Infection

## 2008 North Carolina Case Definition

Viral hemorrhagic fevers (VHFs) are caused by viruses in four distinct families: arenaviruses, filoviruses, bunyaviruses, and flaviviruses. Some of the more common viruses are recognized by disease names such as Ebola, Marburg, and Lassa, Crimean-Congo hemorrhagic and Rift-Valley fevers.

### Clinical description

Signs and symptoms vary by the type of VHF. Early/prodromal manifestations often include high fever, dizziness, muscle aches, loss of strength, and exhaustion. Patients with severe cases of VHF often develop bleeding under the skin, in internal organs, or from body orifices like the mouth, eyes, or ears. However, patients rarely die from blood loss. Laboratory tests often reveal thrombocytopenia ( $\leq 100,000$  platelets/mm<sup>3</sup>), hemoconcentration (i.e., hematocrit increased by  $\geq 20\%$ ) or other evidence of plasma leakage. Severely ill patients may develop shock, delirium, seizures, coma, or multi-system organ failure.

### Laboratory criteria for diagnosis

*(NOTE: Laboratory confirmation represents an extreme biohazard. Viral isolation should only be attempted at CDC or another biosafety level 4 laboratory.)*

- Demonstration of immunoglobulin G (IgG) or immunoglobulin M (IgM) antibody titers to one or more virus antigens in a blood or serum sample, or
- Demonstration of antigen in tissue or serum/blood samples by antigen-detection enzyme-linked immunosorbent assay (ELISA) or immunohistochemistry; detection of viral genome in blood/serum by polymerase chain reaction (PCR); or detection of virus in tissues by electron microscopy, or
- Isolation of virus from serum and/or tissue samples.

### Case classification

*Suspect:* Any clinically compatible illness suspected by a health care provider of being VHF, AND having an epidemiologic link as described below.

*Probable:* A clinically compatible case that is epidemiologically linked to a confirmed case.

*Confirmed:* A clinically compatible case that is laboratory confirmed.

### Criteria for epidemiologic linkage

One or more of the following exposures within the *3 weeks before onset of symptoms*:

- contact with blood or other body fluids- or materials contaminated with blood or body fluids- from a patient with suspected VHF,
- residence in or travel to a VHF endemic area,
- work in a laboratory that handles VHF specimens, *or*
- work in a laboratory that handles animals from VHF endemic areas;

*OR* exposure to semen from a suspected case of Ebola or Marburg VHF within the *6 weeks before onset of symptoms*.