

## What is Bunyaviridae?

The *Bunyaviridae* are a family of viruses that are found in and transmitted by arthropods (e.g. mosquitoes, ticks, sand flies) and rodents, and can occasionally infect humans. Viruses in this group can cause mild to severe illnesses and include but are not limited to the following:

- Crimean-Congo hemorrhagic fever (CCHF)
  - Crimean-Congo hemorrhagic fever (CCHF) is caused by infection with a tick-borne virus (*Nairovirus*) in the family *Bunyaviridae*. The disease was first characterized in the Crimea in 1944 and given the name Crimean hemorrhagic fever. It was then later recognized in 1969 as the cause of illness in the Congo, thus resulting in the current name of the disease.
- Hemorrhagic Fever with Renal Syndrome (HFRS)
  - Hemorrhagic fever with renal syndrome (HFRS) is a group of clinically similar illnesses caused by hantaviruses from the family *Bunyaviridae*. HFRS includes diseases such as Korean hemorrhagic fever, epidemic hemorrhagic fever, and nephropathis epidemica. The viruses that cause HFRS include Hantaan, Dobrava, Saaremaa, Seoul, and Puumala.
- Hantavirus Pulmonary Syndrome (HPS, see [Hantavirus fact sheet](#))
- Rift Valley fever (RVF, see [Rift Valley fever fact sheet](#))

## Who is at risk for Bunyaviridae?

*Crimean-Congo hemorrhagic fever*: People who work with animals in endemic areas are at highest risk. Healthcare workers are at risk of infection through unprotected contact with infectious blood and body fluids.

*Hemorrhagic fever with renal syndrome*: HFRS is found throughout the world and are carried and transmitted by rodents. People who work with or are around rodents in endemic areas are at highest risk.

## What are the symptoms of Bunyaviridae?

*Crimean-Congo hemorrhagic fever*: Symptoms include headache, high fever, back, joint, and stomach pain. Redness of the eyes, face, and throat, or red spots on the roof of the mouth are common. As the illness progresses, large areas of bruising, nosebleeds, and uncontrolled bleeding at injection sites can be seen. Fatality rates have ranged from 9% to as high as 50%.

*Hemorrhagic fever with renal syndrome*: Initial symptoms begin suddenly and include intense headaches, back and abdominal pain, fever, chills, nausea, and blurred vision. Individuals may have flushing of the face, inflammation or redness of the eyes, or a rash. Later symptoms can include low blood pressure, acute shock, vascular leakage, and acute kidney failure, which can cause severe fluid overload. Fatality rates have ranged from 1% to 15%, depending on the specific virus that causes the illness.

## How soon do symptoms appear?

For CCHF and RVF, symptoms can appear between two to 10 days. For HFRS, symptoms can appear seven to 42 days after exposure.

## How is Bunyaviridae spread?

*Crimean-Congo hemorrhagic fever:* The virus is transmitted to people either by tick bites or through contact with infected animal blood or tissues during and immediately after slaughter. The majority of cases have occurred in people involved in the livestock industry, such as agricultural workers, slaughterhouse workers and veterinarians.

Human-to-human transmission of CCHF can occur from close contact with the blood, secretions, organs or other bodily fluids of infected persons. Hospital-acquired infections can also occur due to improper sterilization of medical equipment, reuse of needles and contamination of medical supplies.

*Hemorrhagic fever with renal syndrome:* The viruses that cause HFRS are carried and transmitted by rodents. People can become infected with these viruses and develop HFRS after exposure to aerosolized urine, droppings, or saliva of infected rodents or after exposure to dust from their nests. Transmission of HFRS from one human to another may occur, but is extremely rare.

## When and for how long is a person able to spread the disease?

*Crimean-Congo hemorrhagic fever:* Crimean-Congo hemorrhagic fever virus communicability is unknown and is very infectious in the hospital setting. The virus may remain in the blood and in secretions for months after an individual recovers. Possible horizontal transmission has been reported from a mother to her child.

*Hemorrhagic fever with renal syndrome:* Person to person transmission may occur but is extremely rare.

## How is a person diagnosed?

*Crimean-Congo hemorrhagic fever and Hemorrhagic fever with renal syndrome:* Several tests can be used to detect antibodies. These tests are typically done on blood, plasma and tissue samples.

## What is the treatment?

*Crimean-Congo hemorrhagic fever and Hemorrhagic fever with renal syndrome:* Treatment is primarily supportive including treatment of secondary infections.

## Does past infection make a person immune?

*Crimean-Congo hemorrhagic fever:* Yes. Infection seems to provide lifelong immunity.

*Hemorrhagic fever with renal syndrome:* Immunity is not known.

## Should children or others be excluded from child care, school, work or other activities if they have Bunyaviridae?

*Crimean-Congo hemorrhagic fever and Hemorrhagic fever with renal syndrome:* No. Children and adults may continue to attend work and school, unless they are too ill to participate in normal group activities. However, CCHF virus is present in blood, body fluids and tissues from affected individuals, so hemorrhages are an important source of exposure for other people, particularly family members and healthcare workers.

## What can be done to prevent the spread of Bunyaviridae?

*Crimean-Congo hemorrhagic fever:* Agricultural workers and others working with animals should use insect repellent on exposed skin and clothing. Wearing gloves and other protective clothing is recommended. Individuals should also avoid contact with the blood and body fluids of livestock or humans who show

symptoms of infection. It is important for healthcare workers to use proper infection control precautions to prevent occupational exposure.

If you are in areas where ticks may be present, use the following precautions:

- Wear a long-sleeved shirt, long pants and high socks with pant cuffs tucked into the socks. Light colored clothing will make ticks easier to find. Walk in the center of mowed trails to avoid brushing up against vegetation.
- Conduct thorough "tick checks" on yourself and your children after spending time outdoors. Prompt removal of ticks, even after they have attached, can reduce the chance of RMSF disease transmission.
- Insect repellents containing 0.5 percent permethrin or 20 percent to 30 percent DEET have been shown to be effective in repelling ticks. If such products are used, be sure to follow the manufacturer's directions on the label.

*Hemorrhagic fever with renal syndrome:* Rodent control is the primary strategy for preventing infections. Rodent populations near human communities should be controlled, and rodents should be excluded from homes. Individuals should avoid contact with rodent urine, droppings, saliva, and nesting materials, and the safety measures described below should be followed when cleaning rodent-infested areas.

### **Additional Information:**

Additional information is available by calling the North Dakota Department of Health at 800.472.2180.

**This disease is a reportable condition. As mandated by North Dakota law, any incidence of this disease shall be reported to the North Dakota Department of Health.**

### Resources:

1. Centers for Disease Control and Prevention, 2013: [www.cdc.gov/vhf/virus-families/bunyaviridae.html](http://www.cdc.gov/vhf/virus-families/bunyaviridae.html)
2. World Health Organization, 2014: [www.who.int/mediacentre/factsheets/fs208/en/](http://www.who.int/mediacentre/factsheets/fs208/en/)
3. Control of Communicable Disease Manual, 19th Edition-2015, Heymann, David, MD ed.
4. American Academy of Pediatrics. [Children in Out-Of-Home Care]. In: Kimberlin DW, Brady MT, Jackson MA, Long SS, eds. *Red Book: 2015 Report of the Committee on Infectious Diseases*. 30<sup>th</sup> ed. Elk Grove Village, IL: American Academy of Pediatrics; 2015: 132-151

