

Safety Tips from Tennessee Building Inspections

Hantavirus Danger in Homes

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"Hantavirus" is the name commonly applied to the pathogen that causes the rare yet potentially deadly disease Hantavirus Cardiopulmonary Syndrome (HPS).

HPS is actually caused by several forms of this virus which, collectively, account for just a fraction of all hantaviruses, most of which are not a threat to humans. For the purposes of this article, "hantavirus" will refer only to the forms of that virus that can cause HPS.

This virus is transmitted through rodent feces, urine and saliva, and the primary mode of human contact with hantavirus is through inhalation. Crawlspace and vacated houses are areas where rodent infestations are likely. Inspectors should be knowledgeable about the hantavirus so they can protect themselves and their clients.

Symptoms of HPS

Although researchers are not certain as to how long the virus' incubation period may last, it is generally believed to last up to five weeks. Symptoms of HPS will follow this period.

Early symptoms of HPS almost always include muscle aches, fever and fatigue. Sufferers may also experience nausea, chills, dizziness, diarrhea, abdominal pain and headaches. Four to 10 days after these symptoms first appear, infected persons will find it hard to breathe as their lungs begin to fill with fluid. Coughing and shortness of breath are common respiratory symptoms of the later stages of infection.

There is no known cure, vaccine or treatment that specifically targets HPS. However, if the symptoms are recognized early, patients may benefit from oxygen therapy. If the symptoms of HPS are recognized late, it is less likely that medical intervention will be helpful. The hantavirus kills roughly 30% to 40% of those who become infected.

Places Where the Hantavirus is Likely to be Encountered

Crawlspace are the most likely locations that the hantavirus may be encountered. This is partly due to the fact that rodents are attracted to areas that are undisturbed by humans. Also, crawlspace are generally dark places that lack ultraviolet (UV) radiation, which can rapidly inactivate the hantavirus. The virus will be less likely to be dangerous in areas of the house that receive sunlight through windows. Open windows will also allow contaminants to vent from the home.

Homes that have not been occupied for long periods of time are more likely to experience heavy rodent infestation and hantavirus contamination, among other viruses and bacteria. Foreclosures, in particular, are problem areas. Inspectors should take special precautions when entering vacated homes, or areas in homes that are not adequately ventilated or exposed to sunlight.

The hantavirus can be transmitted to humans in the following ways:

When fresh rodent droppings and urine that contains the hantavirus are disturbed, the virus will become airborne and can be more easily transmitted to humans. The majority of transmissions occur due to inhaled aerosolized droplets that are contaminated with hantavirus.

Touching the nose or mouth after touching anything contaminated by infected rodents can lead to contamination and human infection.

Eating food contaminated by infected rodents can transmit the virus.

Although extremely rare, the virus can be transmitted through a bite from an infected rodent.

The hantavirus cannot be transmitted from infected humans to other humans, or to any other non-rodent animals.

If inspectors must enter a rodent-infested area of a house, they should wear personal protective equipment. The primary mode of transmission for hantavirus is through inhalation, so a respirator is necessary. The Centers for Disease Control (CDC) states that a half-face respirator is adequate, although other sources say that a full-face respirator (covering the eyes, nose and mouth) is required.

The following are specific instructions from the CDC concerning appropriate respirators for hantavirus exposure:

[W]ear either a half-face, tight-seal, negative-pressure respirator, or a positive-pressure, powered air-purifying respirator (PAPR) equipped with N-100 or P-100 filters (formerly designated as high-efficiency particulate air filters [HEPA]). Negative-pressure respirators are not protective if facial hair interferes with the face-piece to face seal because a proper fit cannot be assured.

Rodents that Carry Hantavirus

Four species of mice and rats have been confirmed as carriers of the hantavirus. The CDC offers the following information to identify them:

- 1) The deer mouse is a deceptively cute animal, with big eyes and big ears. Its head and body are normally about 2 to 3 inches long, and the tail adds another 2 to 3 inches in length. You may see it in a variety of colors, from gray to reddish-brown, depending on its age. The underbelly is always white, and the tail has sharply defined white sides. The deer mouse is found almost everywhere in North America. Usually, the deer mouse likes woodlands, but also turns up in desert areas.
- 2) The cotton rat, which you'll find in the southeastern United States (and way down into Central and South America), has a bigger body than the deer mouse—the head and body are about 5 to 7 inches, and another 3 to 4 inches for the tail. The hair is longer and coarser, of a grayish-brown color, even grayish-black. The cotton rat prefers overgrown areas with shrubs and tall grasses.
- 3) The rice rat is slightly smaller than the cotton rat, having a head and body 5 to 6 inches long, plus a very long, 4- to 7-inch tail. Rice rats sport short, soft, grayish-brown fur on top, and gray or tawny underbellies. Their feet are whitish. As you might expect from the name, this rat likes marshy areas and is semiaquatic. It's found in the southeastern United States and in Central America.
- 4) The white-footed mouse is hard to distinguish from the deer mouse. The head and body together are about 4 inches long. Note that its tail is normally shorter than its body (about 2 to 4 inches long). Topside, its fur ranges from pale brown to reddish-brown, while its underside and feet are white. The white-footed mouse is found throughout southern New England, the Mid-Atlantic and southern states, the midwestern and western states, and Mexico. It prefers wooded and brushy areas, although sometimes it will live in more open ground.

Although the virus can appear anywhere in the United States, it is more prevalent West of the Mississippi. Males and Caucasians are also somewhat more likely to contract HPS than females and other races, although it is likely that this occurrence is due to factors that are not gender- or ethnicity-specific, but are probably more attributable to occupational exposure and the higher frequency of Caucasians in the western United States.

It is possible that the virus can be carried by other species of rodents that have yet to be identified.

In summary, hantavirus should be taken seriously by every inspector and real estate agent because this virus is encountered in homes more than in any other location. The disease that it causes, HPS, has no cure, and very few people know enough about it to protect themselves from infection.