



# HANTAVIRUS and ARENAVIRUS

## RODENT-BORNE DISEASE INFORMATION SHEET



**DEER MOUSE**



**MEADOW MOUSE**



**HOUSE MOUSE**

Hantavirus Pulmonary Syndrome is a disease that was first identified following a major outbreak of the disease in New Mexico during 1993. A rodent-borne disease, Hantavirus has since been found throughout most of the United States. Human illnesses, including over 100 deaths, have been reported from 32 states. The virus is endemic in all areas of California. In Santa Barbara County, Hantavirus has been found in Santa Ynez, Vandenberg Air Force Base, on the Channel Islands, and in the greater Santa Barbara area. Arenavirus is an even more recently discovered rodent-borne virus. This virus was suspected of causing two human fatalities in California during 2000. These are the only two human cases of Arenavirus documented in the United States. Rodents infected with Arenavirus have been found on Santa Barbara County's South Coast.

Hantavirus is transmitted mainly through the feces, urine, and saliva of infected rodents, particularly by inhaling dust particles contaminated with feces, urine, and saliva. People can also be infected with the virus from a rodent bite or by touching their mouth, nose, or eyes after handling infected rodents, rodent droppings, or rodent nests. The California Department of Health Services recommends that buildings with heavy rodent infestations be ventilated and aired-out for several hours, then cleaned thoroughly where droppings have accumulated. As a precaution, the droppings should be moistened by spraying from above with a household cleaner such as a mixture of one part household bleach to five parts water and wet to the point of just being damp but not soaked. They should then be wiped up, placed in double plastic bags, and then disposed of in the trash. **DO NOT SWEEP OR VACUUM DROPPINGS** because of the possibility of contaminated dust particles being inhaled. Rubber gloves and dust masks are recommended. Wash hands thoroughly after cleaning up rodent contamination. **NEVER HANDLE OR FEED LIVE WILD RODENTS.** Dead rodents should be disposed of the same way as with droppings. Laboratory testing for Hantavirus in rodents collected by individuals is not available. Rodents should be controlled in cabins and other structures through exclusion, trapping, and the use of approved rodenticides. When outdoors, do not disturb rodent burrows and nesting areas or camp, sleep, or rest near them.

Symptoms of Hantavirus Pulmonary Syndrome are initially flu-like; cough, fever, headache, nausea, vomiting, abdominal pain, shortness of breath, and aching muscles and joints. The disease can progress within hours to a life-threatening stage in which the lungs fill with fluid. Mortality is 30-40%, so **prompt medical attention is vital.** Onset of symptoms can occur up to 6 weeks (usually 2-3 weeks) following exposure to the virus. Since Hantavirus Pulmonary Syndrome was first identified in 1993, there have been

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following exposure to the virus. Since Hantavirus Pulmonary Syndrome was first discovered there have been 58 cases (20 fatal) in California as of January 1, 2013. One of the fatalities was a Santa Ynez Valley man that occurred in 1992, before the discovery of Hantavirus. In addition, non-pulmonary human cases (Hantavirus infection without respiratory distress) have been identified in California.

Arenavirus is believed to be transmitted to humans the same way as Hantavirus. Initial symptoms of Arenavirus are also flu-like. Advanced symptoms can include high fever, respiratory distress, and sometimes liver disease and hemorrhaging.

Approximately 30 strains of Hantavirus are known to occur worldwide, including 3 strains in California. In the United States, the Sin Nombre strain has caused most of the known cases of Hantavirus Pulmonary Syndrome. The Deer Mouse (*Peromyscus maniculatus*) is the primary vector of Sin Nombre. Deer Mice are very common in foothill, mountain, and other open areas throughout Santa Barbara County. Many other rodent species are very similar in appearance to Deer Mice and Wood Rats, so ALL RODENTS SHOULD BE PRESUMED TO BE INFECTED. The two other strains of Hantavirus that exist in California are not believed to cause human illness. The Isla Vista strain, carried by the California Meadow Vole or Meadow Mouse (*Microtis californicus*), was discovered for the first time in Goleta during 1994. The El Moro Canyon strain is carried by the Western Harvest Mouse (*Reithrodontomys megalotis*) and has been found on the South Coast. Meadow Mice and Harvest Mice rarely enter human dwellings. Seoul Virus (an Asian strain of Hantavirus that is known to cause human illness) was found to be infecting a single domestic Roof Rat (*Rattus rattus*) in Orange County, California during 1999. No subsequent finds of Seoul Virus have been made to date, but rodents can carry other diseases including salmonella, so the precautions described above should be taken for all rodents.

Deer Mice and Wood Rats are the primary carriers of Arenavirus. At least two strains of Arenavirus, Whitewater Arroyo and Bear Canyon, have been identified in California. **Precautions for Arenavirus are the same as those described above for Hantavirus.**

The Mosquito and Vector Management District conducts routine surveillance of local rodent populations in order to better determine which species of rodents carry and transmit Hantavirus and Arenavirus, the infection rates of the populations, and to learn more about the biology of the diseases. This is part of a statewide and nationwide study involving the National Centers for Disease Control and Prevention and the California Department of Public Health to determine how, when, and why Hantavirus and Arenavirus become threats to humans.

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