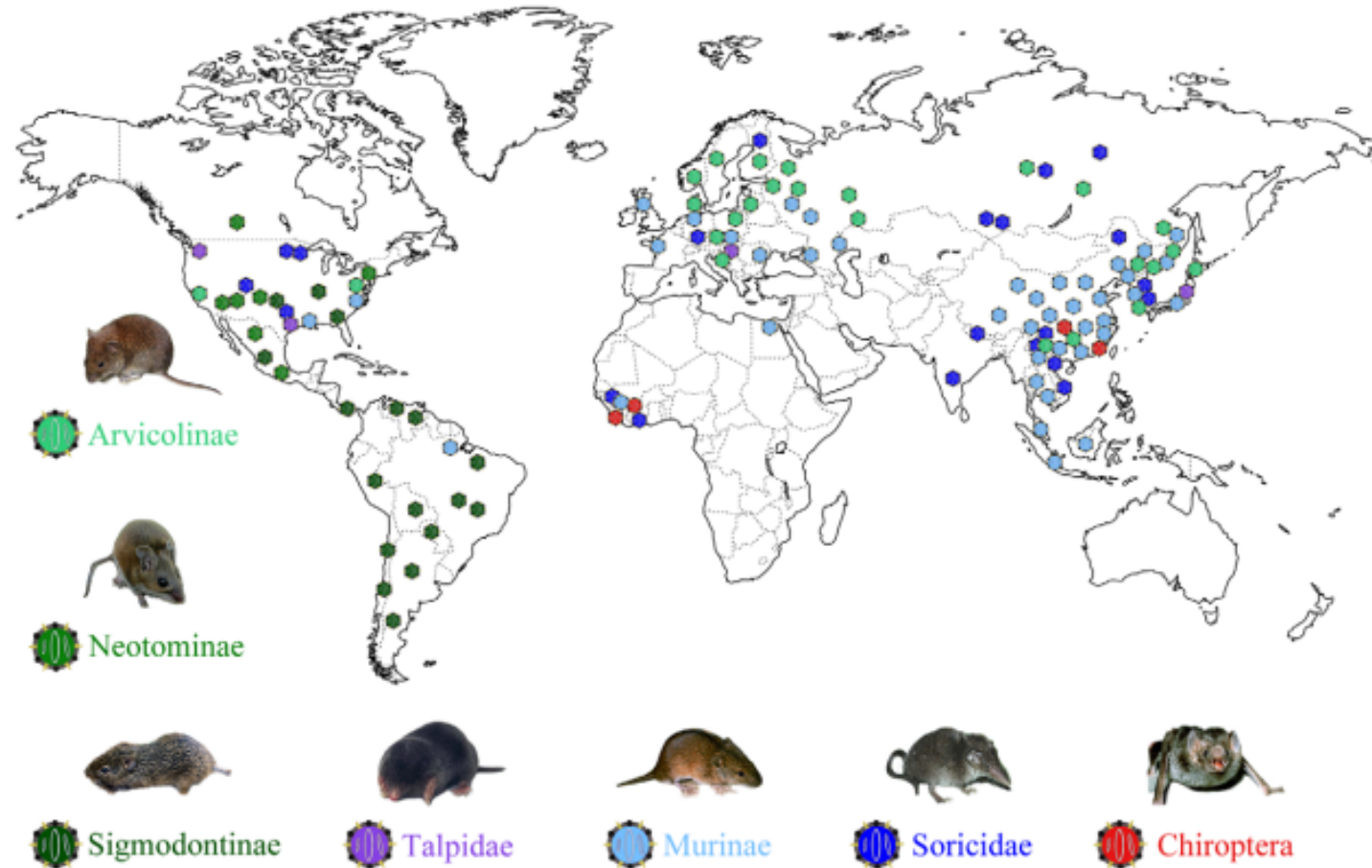




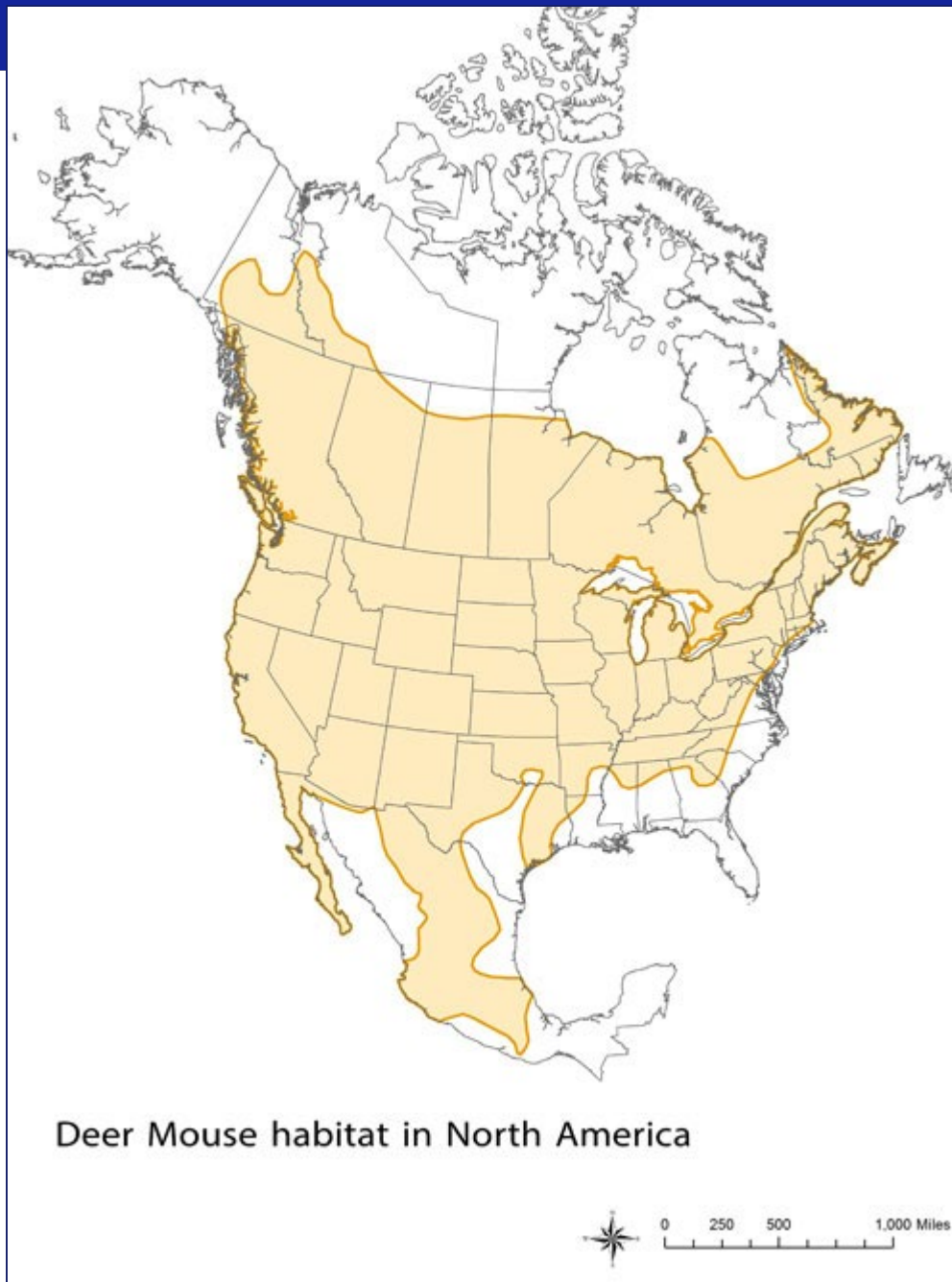
# Hantavirus in California

Anne Kjemtrup, DVM, MPVM, PhD  
Infectious Disease Branch  
Vector-Borne Disease Section

# Hantaviruses are found worldwide



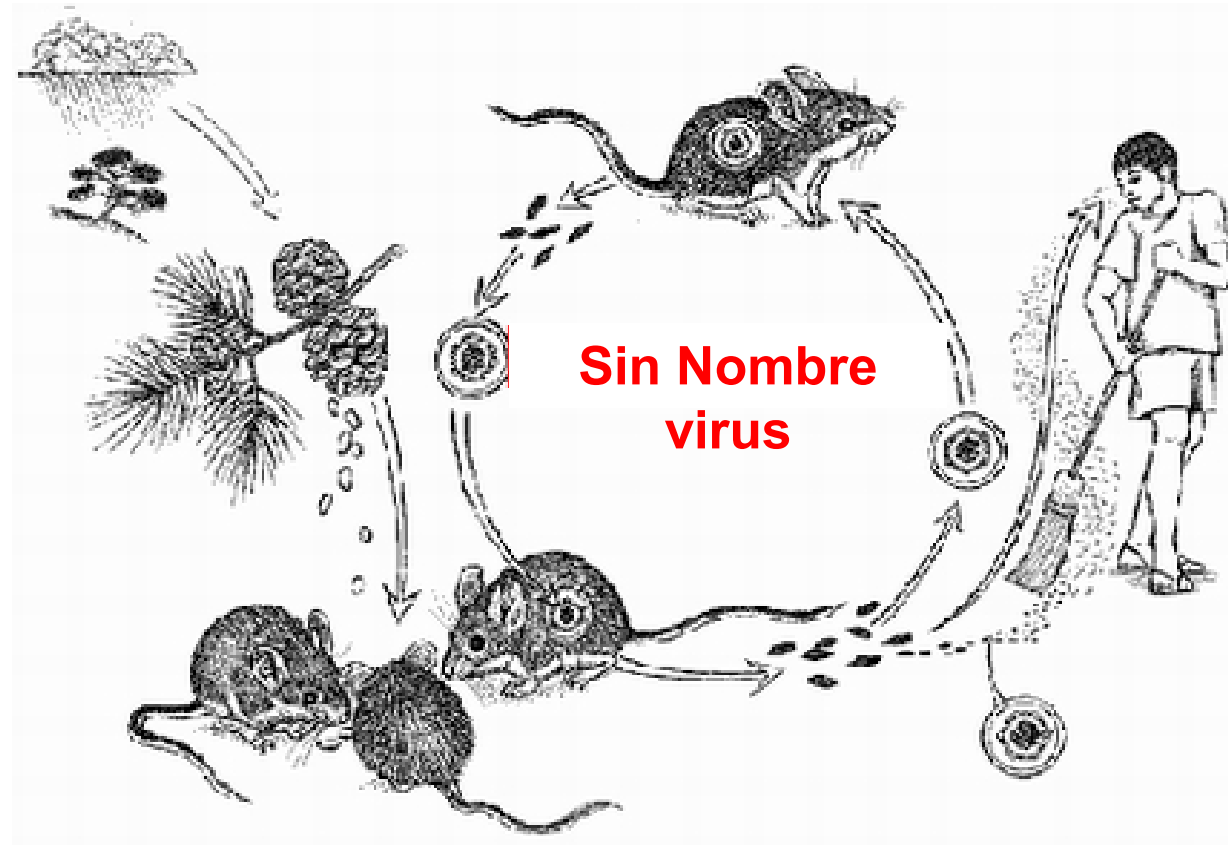
**Figure 3. A map of the world illustrating the location of known hantaviruses by host group and associated mammalian hosts.**  
doi:10.1371/journal.ppat.1003159.g003



*Peromyscus  
maniculatus*

Sin Nombre virus (SNV)

# Hantavirus (Sin Nombre Virus) Transmission



Source: <https://naturalunseenhazards.wordpress.com/tag/hantavirus-pulmonary-syndrome/>

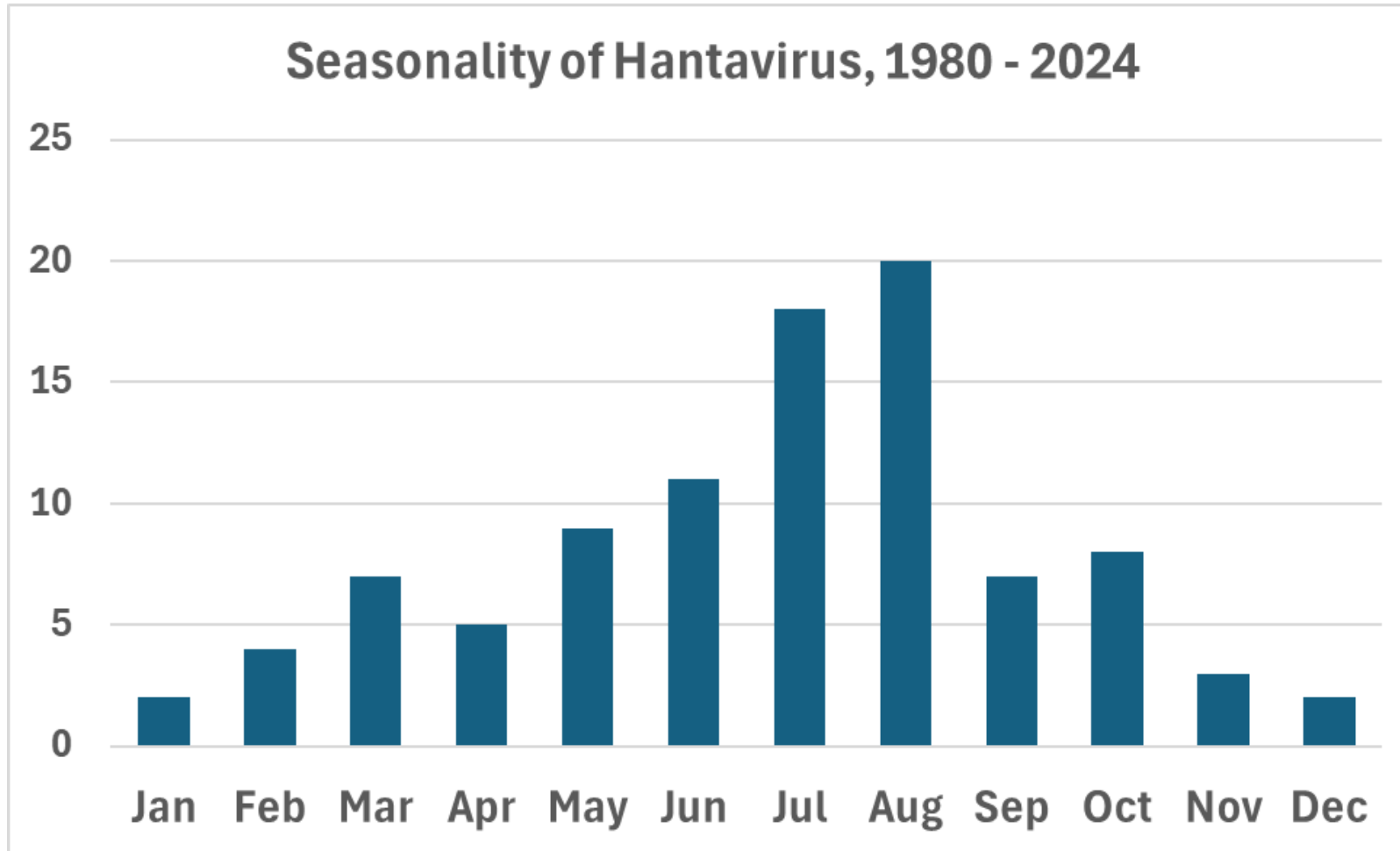
# Symptoms and treatment of HPS

- Early Symptoms (1-3 days after onset)
  - Flu-like: Fatigue, fever, muscle aches
- Late Symptoms (4-10 days after onset)
  - Coughing
  - Shortness of breath
  - Rapidly progresses as lungs fill with fluid
- 30 – 40% mortality
- Only supportive treatment: No vaccine or antibiotics
  - Early treatment is key

# Diagnosis- Laboratory testing is complex

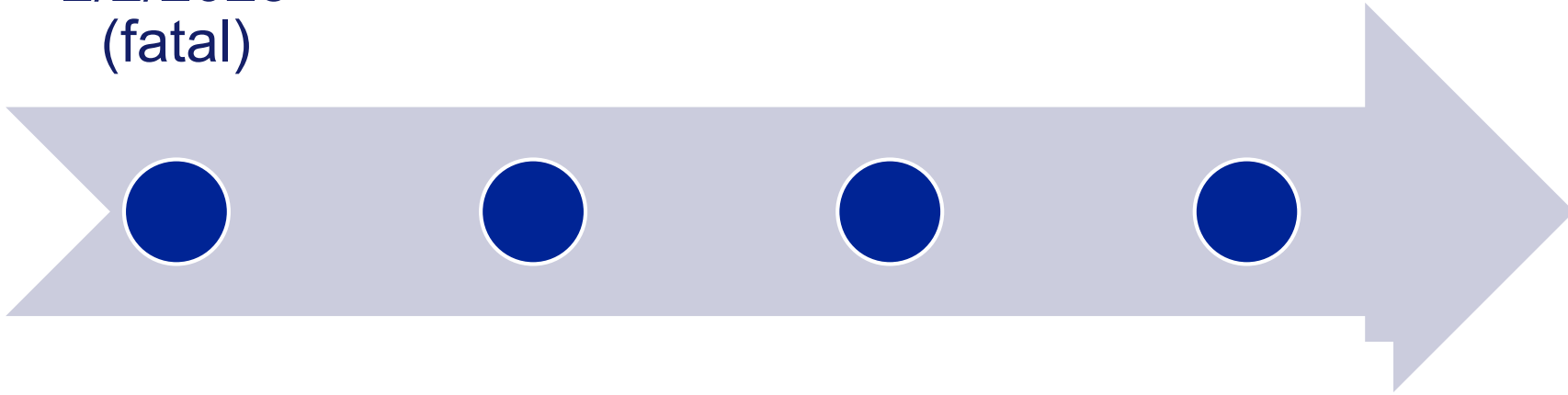
- No “bedside” test
- Antibody test
  - Quest – Commercial
  - State Public Health Laboratory for confirmation (e.g. Viral and Rickettsial Disease Laboratory- VRDL).
- Molecular test (PCR) (blood, serum, sputum, tissues) - VRDL
- Other tests
  - Immunohistochemistry (IHC) (at CDC, post-mortem tissues)
- Screening assessment (“5-point screen” - blood smear and other measures) can help predict (to be discussed later)

# Seasonality of Hantavirus



# 2025: Four Cases Early in Year (Unusual)

Mono  
County  
2/2/2025  
(fatal)

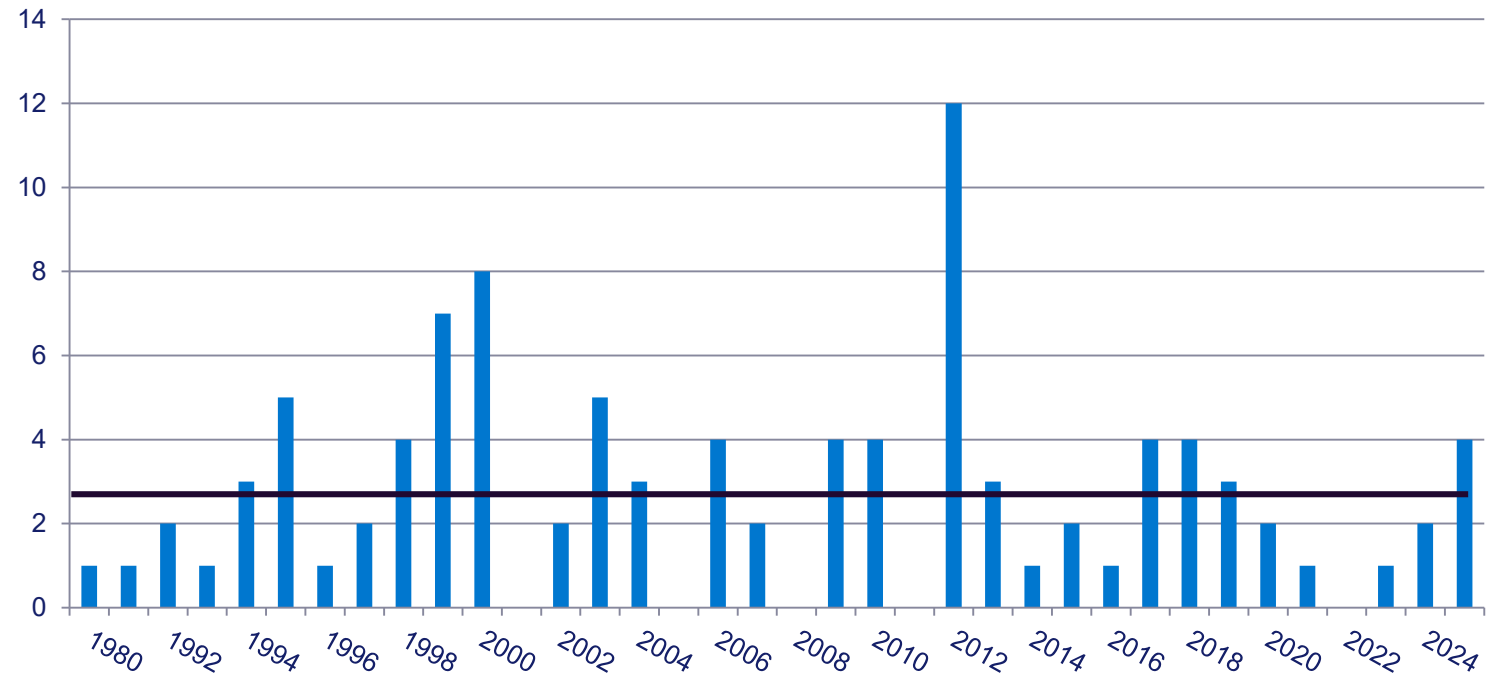




# Sin Nombre virus Infections in California Residents, 1980-2025

100 hantavirus infections

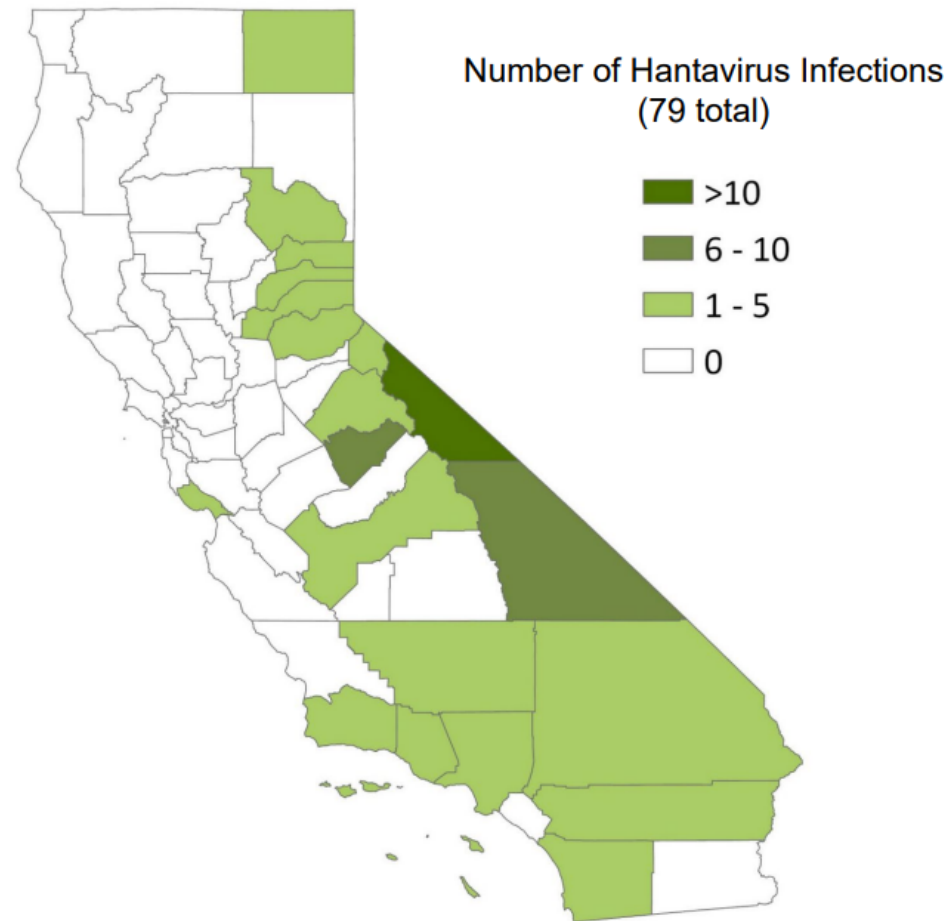
- 60 male, 40 female
- Age range: 8 – 78
- Median age: 42
- Avg cases/year: 3
- Fatal: 34
- Non-Fatal: 66



# Counties of Exposure

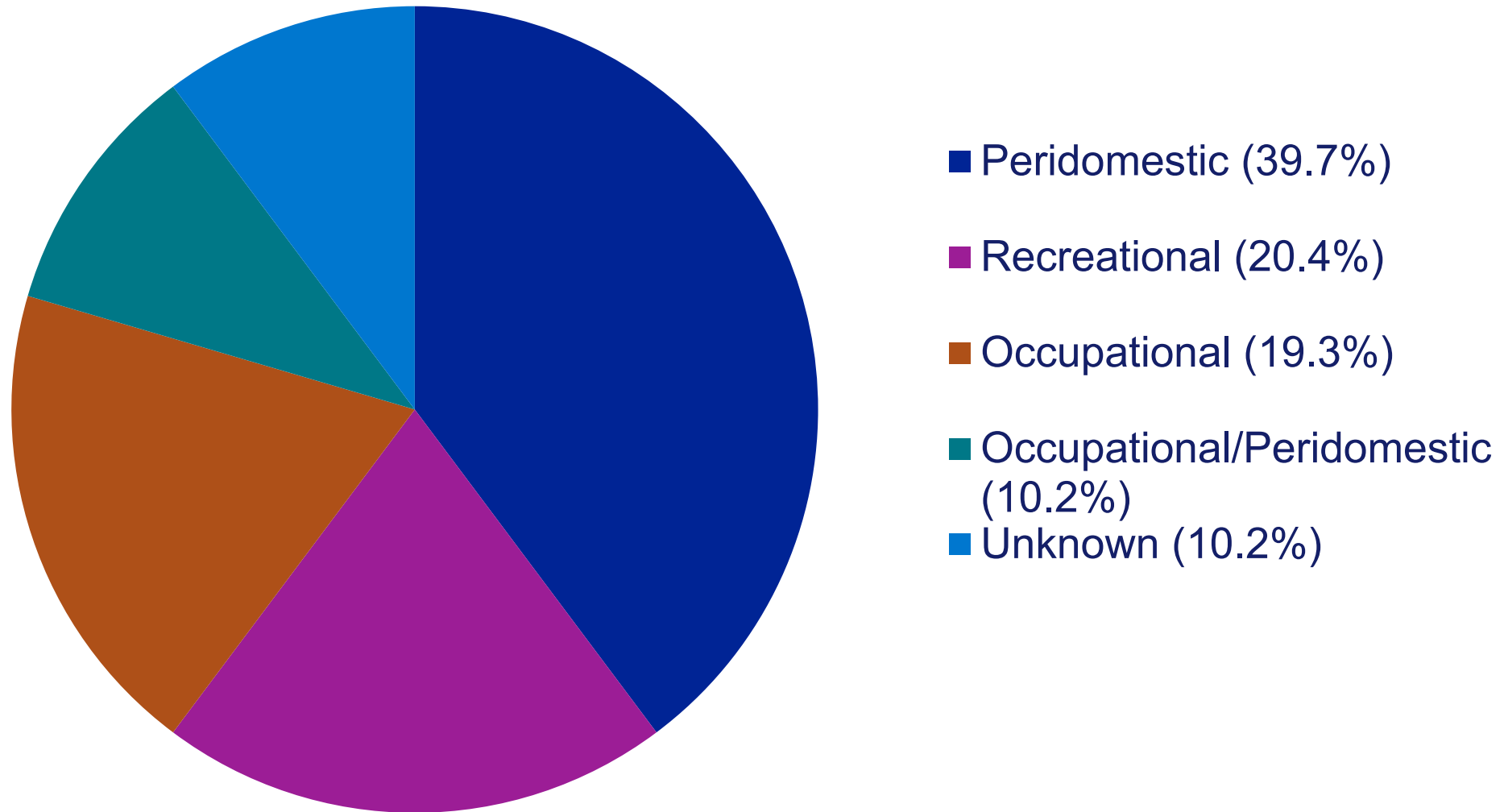


## County of Exposure for Reported Hantavirus Infections in California Residents, 1980 – 2024 \*



\*Represents only those cases where county of exposure determined by case-patient history, and epidemiologic and environmental evaluation. Exposure location not obtainable for all reported cases.

# Exposure Circumstances in CA Residents, 1980 - 2025



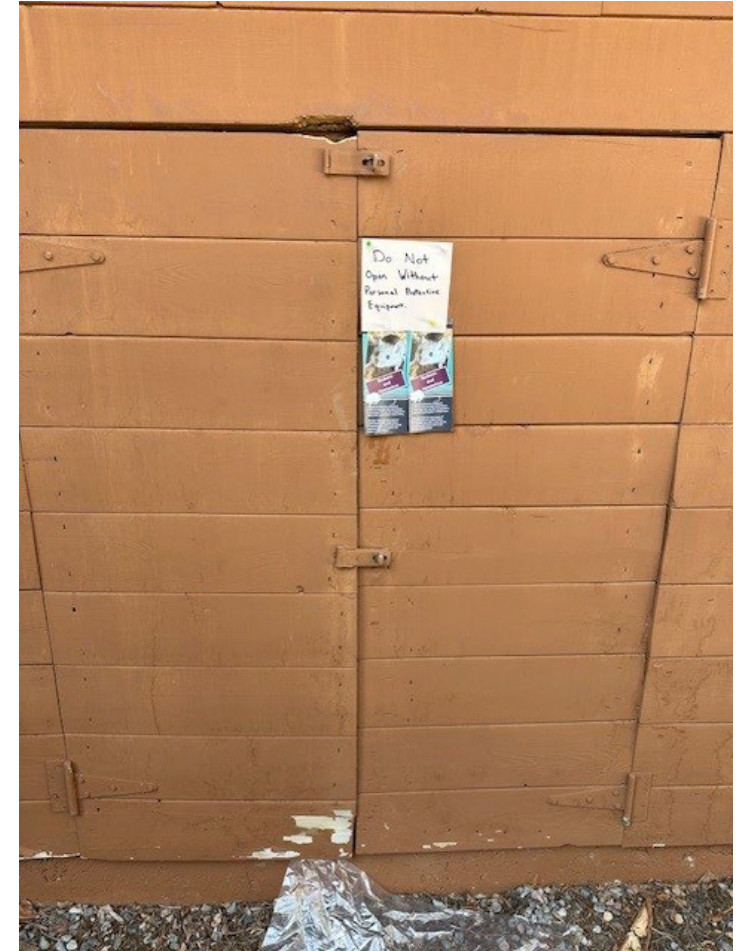


# Examples of Exposure Location





# Exposure investigations



# Exposure investigations





of wild rodents, specifically **deer mice**. You can help prevent hantavirus infection by keeping wild rodents out of your home or workplace.

If you find live or dead mice, nests, droppings, or chew marks indoors, it is important to follow these steps:



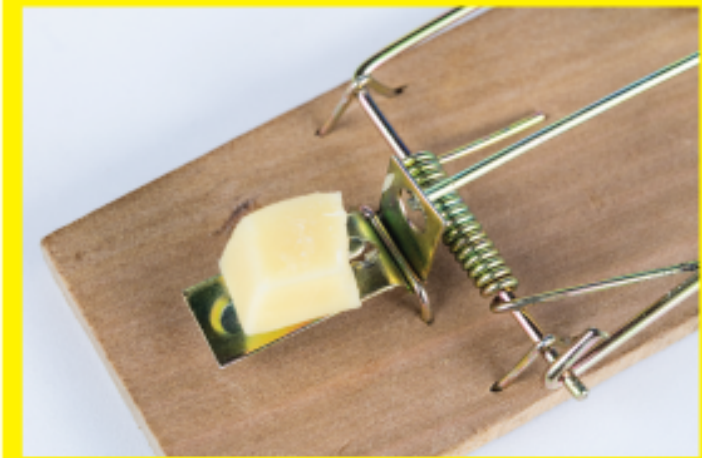
## 1 SEAL

openings where mice can enter



## 2 TRAP

mice with a snap trap



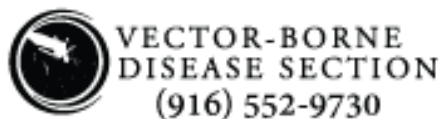
## 3 CLEAN

contaminated areas with a disinfectant



**DO NOT** sweep or vacuum!

Before entering a building or room that may be infested with rodents, allow the area to air out for at least 30 minutes. You can get hantavirus by breathing in air that is contaminated with the virus.



Learn more: [bit.ly/HantavirusCDPH](https://bit.ly/HantavirusCDPH)



# IPM: Seal Up, Trap Up, Clean Up

Seal up holes inside and outside buildings.

- Mice can squeeze through a hole the size of a pencil (1/4 inch)
- Prevent mice from entering buildings by sealing any gaps or holes
- A variety of materials can be used to seal the openings:
  - 1/4-inch galvanized hardware cloth
  - steel wool
  - sheet metal
  - mortar
  - concrete
  - expanding foam





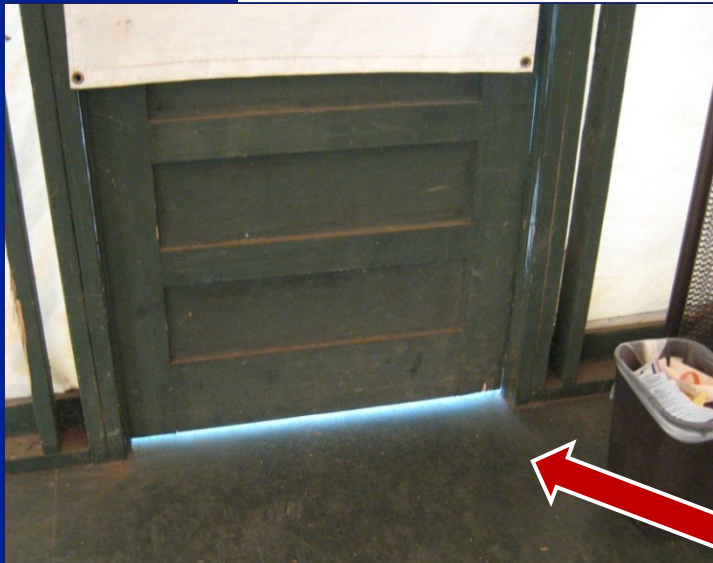
# Seal Up

Seal around all pipes and conduits

Seal holes



# Seal Up



## Seal thresholds



# Seal Up

- Place firewood, woodpiles, trash cans, or dumpsters at least 100 feet from buildings
- Fix leaks in sprinklers or other outside pipes that might attract mice





# Trap Up

- Mouse-sized traps
- Small amount of peanut butter
  - Size of a pea
- Place against walls so peanut butter is closest to wall
- Place in areas w/ mouse activity



- No glue or live traps
- Maintain trap logs
- Continue trapping after exclusion
- Use appropriate PPE and disinfection protocols

# Clean Up

- Use ONLY wet-cleaning methods to minimize the chance of aerosolizing the virus
- DO NOT stir up dust by sweeping or vacuuming



# Clean Up

Clean up urine, droppings, or nesting materials

- Wear gloves and eye protection
- Spray urine, droppings, carcasses, and traps with a disinfectant or a mixture of bleach and water and let soak five minutes
- If bleach or a commercial disinfectant is used, follow the label instructions



# Clean Up: Sunshine - Ultraviolet





# Prevention: CDPH.CA.GOV



I am looking for

I am a

Programs

A-Z Index

Home | Programs | Center for Infectious Diseases | Division of Communicable Disease Control | [Hantavirus Infection](#)

## HANTAVIRUS INFECTION

Vector-Borne Disease  
Section

California West Nile Virus  
Website

Mosquito-Borne Diseases ▶

*Aedes aegypti* and *Aedes albopictus* Mosquitoes

Lyme and Other Tick-Borne  
Diseases ▶

**Hantavirus Infection**

Plague

Typhus (Flea-Borne)

Public Health Pests ▶

Vector-Borne Disease  
Educational Materials

Vector Control Technician  
Certification Program

CDC Vector-Borne Diseases

en Español

### What is hantavirus?

Hantavirus is a virus that spreads through the urine, droppings (poop), or saliva of wild rodents, including **deer mice**, which are common in many parts of California. Hantavirus can cause serious disease in humans.

### How can a person become infected with hantavirus?

People can become infected with hantavirus when they breathe in air that is contaminated with the virus. Particles containing hantavirus get into the air when dried mouse urine, saliva, or droppings are stirred up. The chances of this happening increase when opening or cleaning buildings in rural areas that have been closed for the winter where deer mice have entered, or for people working, playing, or living in closed spaces where mice are present.

Symptoms of hantavirus infection can be mild or severe, depending on whether a person's lungs become infected. There is no specific treatment for hantavirus infection, but early medical care can help if serious disease develops.



### How can I help prevent hantavirus infection?

Because hantavirus infection can be serious, even deadly, it is important to know how to prevent it. The best way to prevent hantavirus infection is to keep wild rodents, especially mice, out of your home, workplace, cabin, shed, car, camper, or other closed space:

- Seal up holes (the width of a pencil or larger) and other openings where mice can get in.
- Place snap traps to catch any mice (do not use glue traps or live traps).
- Store all food items in rodent-proof containers to keep mice away.

Learn more: [How to Seal Up to Prevent Rodents](#)

### If you find signs of mice or other rodents, it's important to clean up after them safely to reduce your chances of getting sick:

#### Before you start cleaning

- Gather the proper supplies, including rubber or plastic gloves and a disinfectant or [bleach solution made from a mixture of household bleach and water](#).
- Air out the space you will be cleaning for 30 minutes.

#### While cleaning (wear gloves)

- Spray the contaminated area with the disinfectant or bleach solution until very wet, and let it soak for at least 5 minutes.
- Use paper towels, a sponge, or mop to clean up the contaminated area.

#### Important!

If you are cleaning an area that may be contaminated with live or dead mice, mouse droppings, or mouse nests, **do not sweep or vacuum the area**. This can stir up droppings or other materials contaminated with hantavirus into the air.



Learn more: [How to Clean Up After Rodents](#)





# Conclusion

- Four early season (February) cases of hantavirus cardiopulmonary syndrome identified in 2025 unprecedented.
- Raises concern for awareness of disease (2 cases identified postmortem) and potential of additional cases.
- Environmental exposure investigations found ample rodent evidence – emphasizes need to prevent rodent incursion and careful clean up protocols should be followed.
- Informational resources available at CDPH:  
<https://www.cdph.ca.gov/Programs/CID/DCDC/pages/hantaviruspulmonarysyndrome.aspx>

# Acknowledgments

- Infectious Diseases Branch-Vector-Borne Disease Section
- Viral and Rickettsial Disease Laboratory
- Mono County Health Department
- Placer County Health Department



**Thanks for you  
attention**



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