



ADAMS COUNTY
HEALTH DEPARTMENT

Your Health. Our Mission.



Vector Program Overview

- **What is a vector?**

- An organism that transmits a pathogen from reservoir to host

- **What does the vector team do?**

- Investigate and survey sources of vector-borne diseases

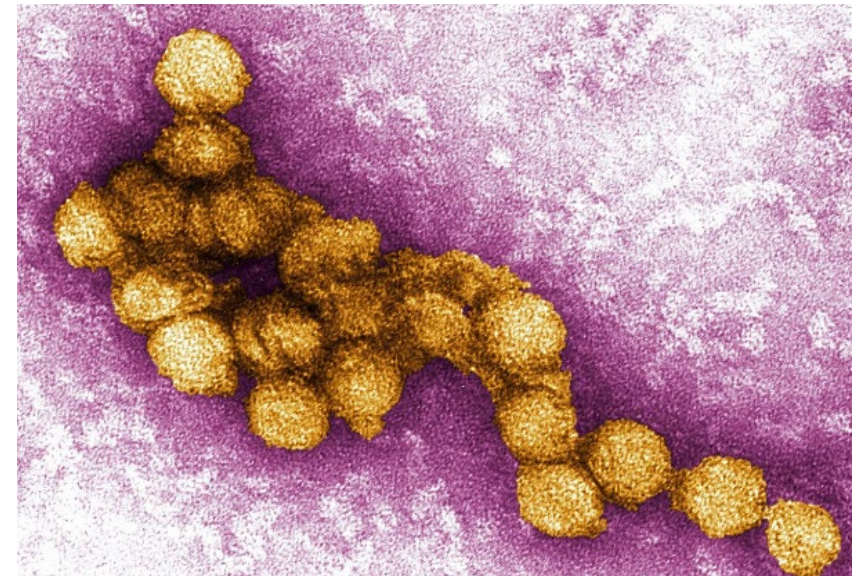
- **These diseases include:**

- West Nile Virus (WNV)
- Rabies
- Tularemia
- Plague
- Hantavirus

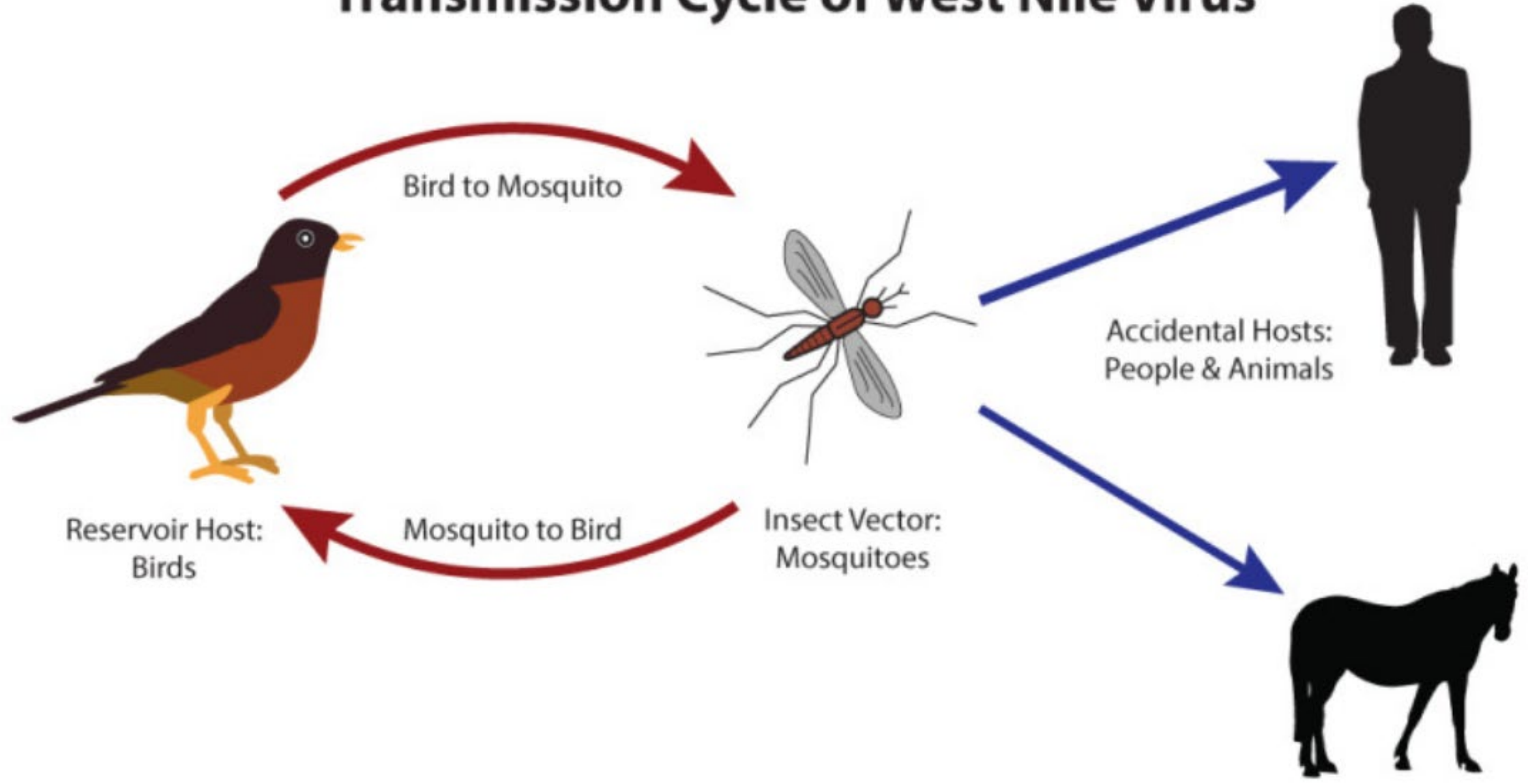


What is WNV?

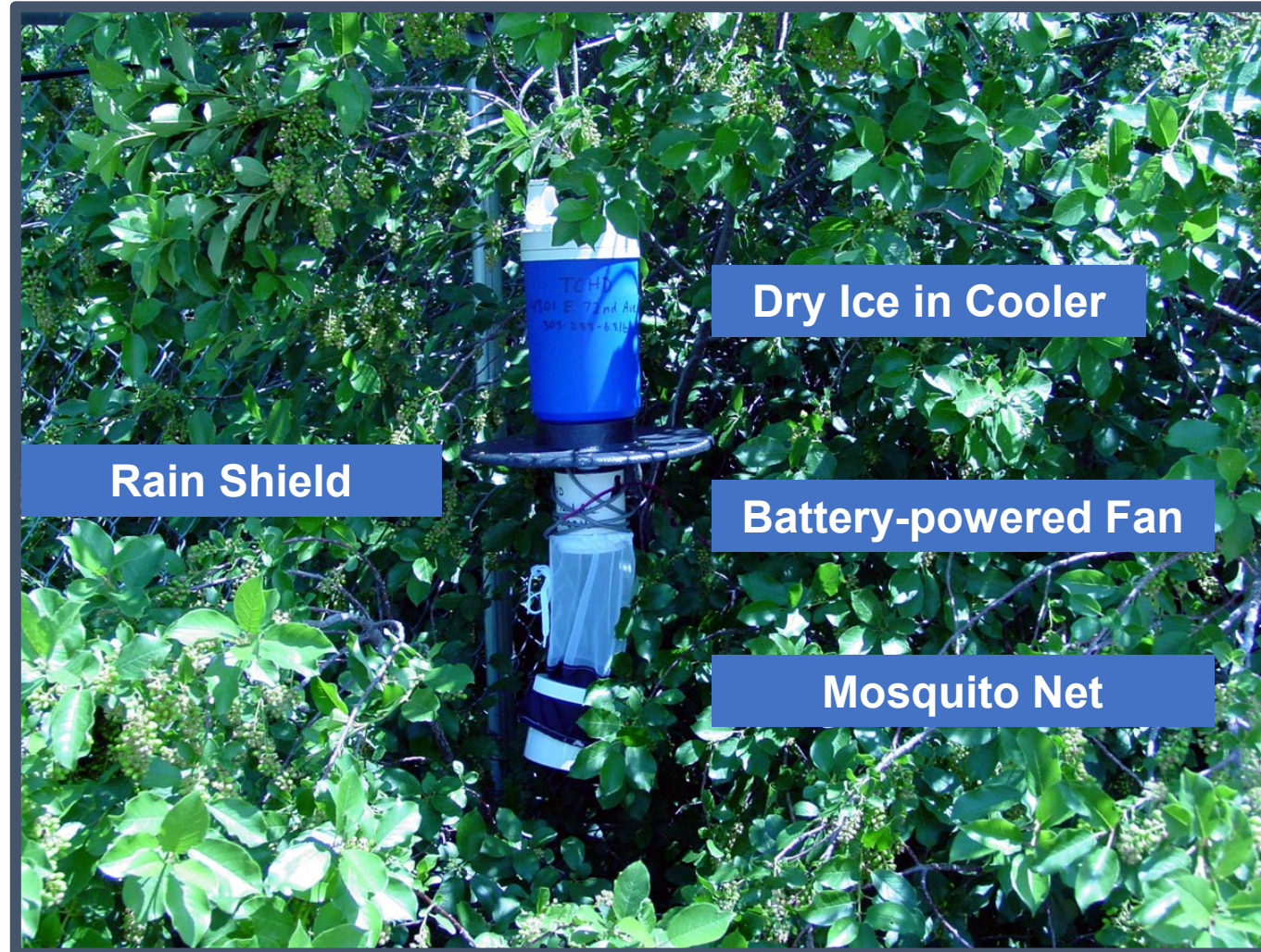
- **West Nile Virus**
 - Carried through mosquitoes and transmitted through a bite
 - Usually mild in most cases – asymptomatic or low-grade fever
 - 1 in 5 people infected develop a fever with other symptoms such as headache, body aches, joint pains, vomiting, diarrhea, or rash
 - Can lead to encephalitis and death in immunocompromised populations
- **Arrived in the USA in 1999**
 - First Colorado case was detected in 2002
 - Adams County experienced the heaviest WNV load in 2003
 - Monitoring ever since



Transmission Cycle of West Nile Virus



How do we trap mosquitoes?



Why do we ID Mosquitoes?

- **Only certain mosquitoes can live and survive in Colorado**
 - Specifically only certain species can transmit WNV
 - *Culex pipiens*, *Culex tarsalis*, *Aedes vexans*
- **Male or Female?**
 - Only female mosquitoes bite people and animals to get a blood meal
 - Female mosquitoes need a blood meal to produce eggs
- **Separate out species**
 - Submit to laboratory for testing to see if WNV is detected in sample
 - If positive, notify mosquito contractor for treatment in that area to reduce mosquito population and the risk of transmission to residents



Trap Setting Locations

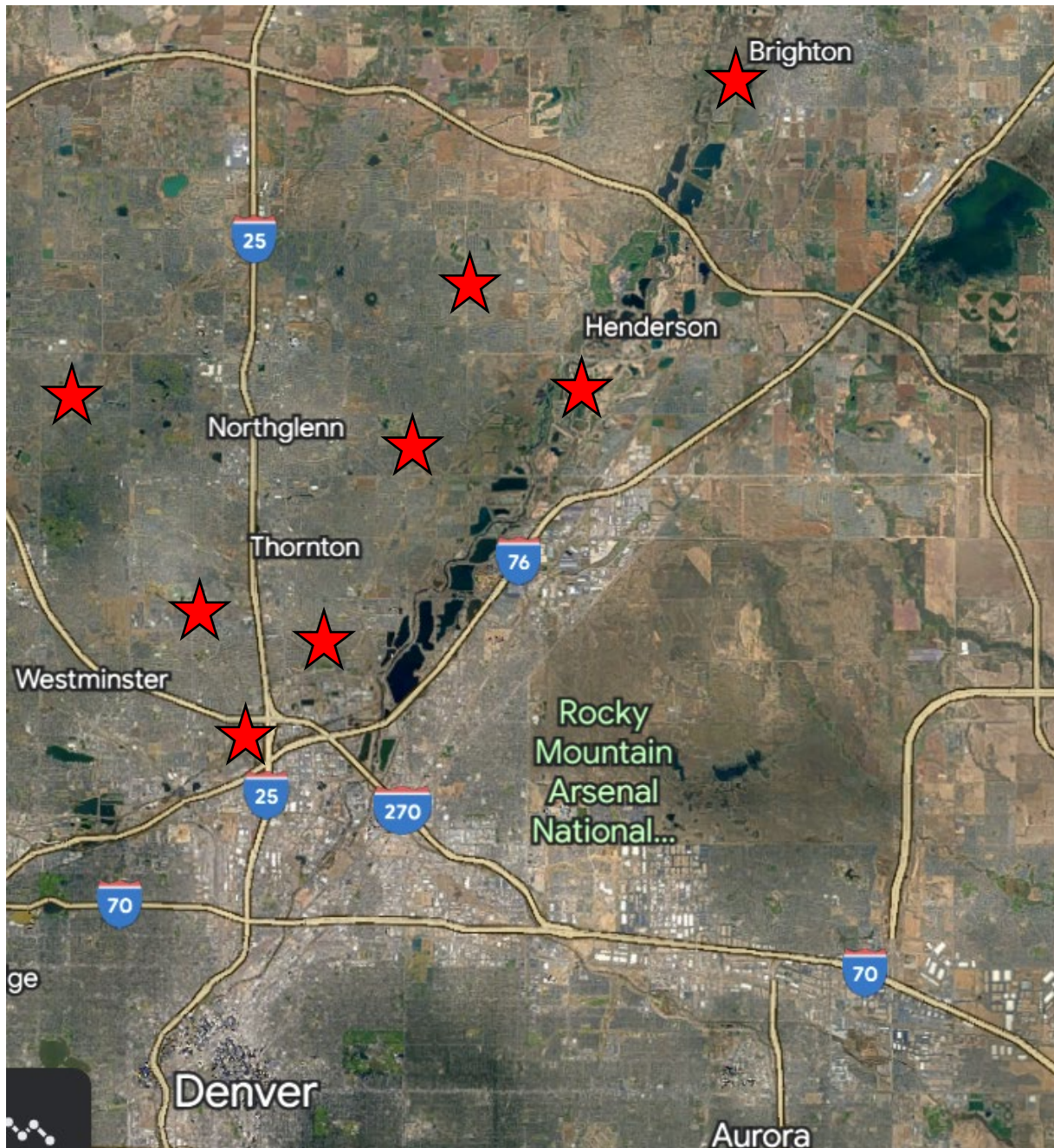
- **Historical Data**

- In the past, TCHD set 10 traps for surveillance and testing
- Same locations to continue monitoring data from year to year
- Locations are near standing water where mosquitoes breed and in areas of higher population
- CDPHE provides funding for an allotment of testing samples for approved sentinel sites

- **Mosquito Control Contractor**

- Several cities and unincorporated areas within Adams County have a contractor who conducts trap surveillance and does the actual control
- Coordinated effort to manage mosquito numbers and control of WNV





- Brighton
- **Burbach (S)**
- **CO Ag Trail (S)**
- **Fossil Ridge (S)**
- Henderson
- Rotella Park
- **South Platte River Park (S)**
- Southwest Adams
- **Stratford Lakes (S)**

- Bennett
- Strasburg

- Additional 27 traps through mosquito contractor

Protection from WNV

- **Prevent yourself from getting mosquito bites**

- Use insect repellent (products containing DEET)
- Wear long sleeve shirts and pants when outside
- Avoid being outside during dusk and dawn when mosquitoes are generally more active



- **Reduce breeding areas around your home**

- Eliminate standing water
- Remove junk/clutter outside that can hold water
- Clean gutters to ensure proper drainage
- Reduce thick vegetation
- Use larvicide in areas where standing water can't be eliminated



What is Rabies?

- **Viral disease that attacks the nervous system**
 - Always fatal unless appropriate treatment is administered
 - Spread to people and pets if bitten or scratched by a rabid animal
 - All mammals can get rabies
 - In Adams County, it is mainly found in bats, racoons, skunks and foxes (reservoir for the disease)



Rabies Transmission

- **Infectious path of the virus**

- Bitten or scratched by rabid animal



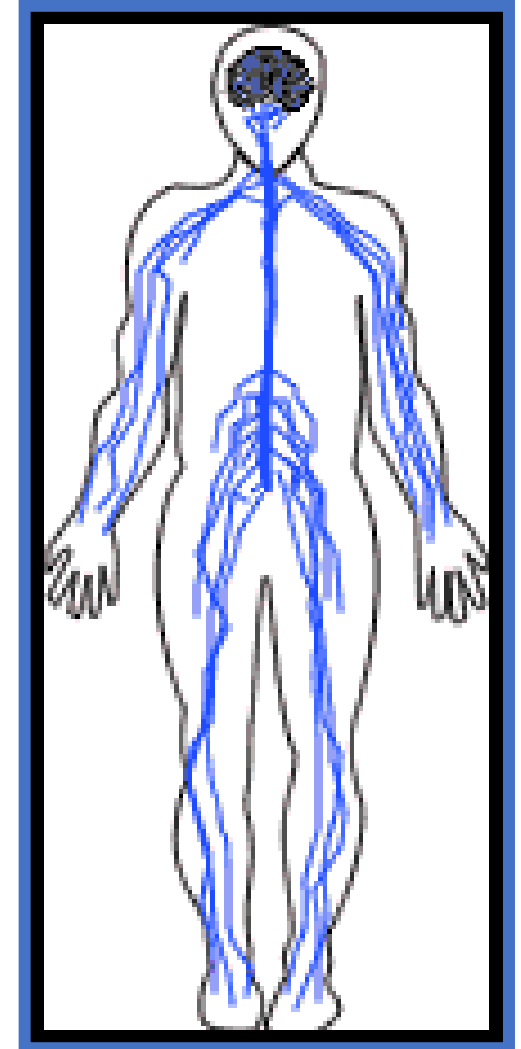
- Virus from infected saliva enters the wound



- Virus Travels from the site of the bite to the brain by moving within the nerves (approximately 3-12 weeks)



- Once inflamed in brain, it moves to salivary glands and symptoms appear



Protection from Rabies

- **In Pets**

- Ensure your pets are up to date on vaccinations and visit your vet routinely
- Maintain control of your pets by keeping cats indoors and keeping dogs under direct supervision
- Call animal control to remove all stray animals from your neighborhood since these animals may be unvaccinated or ill



Protection from Rabies

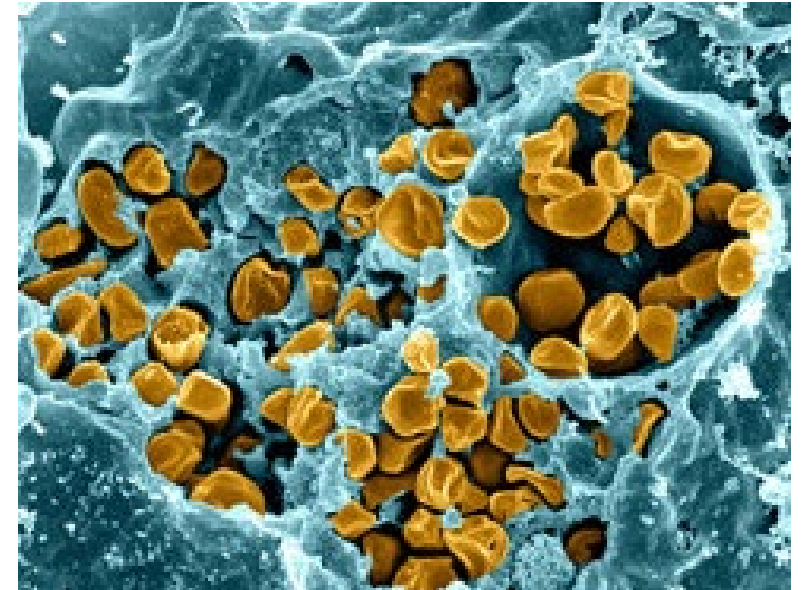
- **In People**

- Leave all wildlife alone, including injured animals
- Contact with infected bats is the leading cause of rabies deaths in people in the USA. Bites and scratches from bats can be very small. Seal up your home to prevent bats from entering.
- Wash animal bites or scratches immediately with soap and water
- If you are bitten, scratched, or unsure, talk with your healthcare provider whether you need post exposure prophylaxis
- If your pet comes in contact with a wild animal, notify public health/animal control



What is Tularemia?

- **Bacterium *Francisella tularensis***
 - Often referred to as Rabbit Fever
 - Tularemia is a disease that can infect animals and people
 - Rabbits, hares, and rodents are especially susceptible and often die in large numbers during outbreaks
 - The bacterium that causes tularemia is highly infectious and can enter the human body through the skin, eyes, mouth, or lungs



Transmission to People

- Tick and deer fly bites
- Skin contact with infected animals
- Drinking contaminated water
- Inhaling contaminated aerosols or agricultural and landscaping dust
- Laboratory exposure
- Bioterrorism

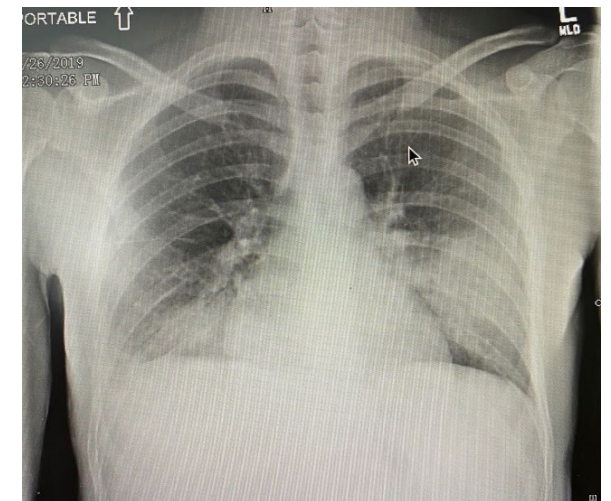


What are the Symptoms?

- Signs and symptoms vary depending on how the bacteria enter the body
 - These include, Ulceroglandular, Glandular, Oculoglandular, Oropharyngeal, Pneumonic, and Typhoidal
- All forms are accompanied by a fever
- Pneumonic is the most serious form as it affects the lungs
- Tularemia can be difficult to diagnose and can be mistaken for more common illnesses
- Antibiotics are used to treat



An ulcer caused by *Francisella tularensis*.



Prevention from Tularemia

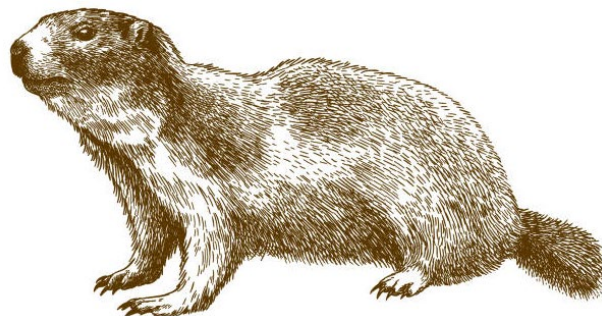
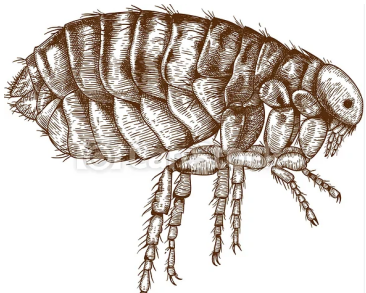
- **When hiking camping, or working outdoors**
 - Use insect repellent (products containing DEET)
 - Don't drink untreated surface water
 - Wear long pants, long sleeves, and long socks to keep ticks and deer flies off your skin
- **When mowing or landscaping**
 - Don't mow over sick or dead animals
 - Use of masks may reduce your risk of inhaling the bacteria
- **When hunting, trapping or skinning animals**
 - Use gloves when handling animals
 - Cook game meat thoroughly before eating



Cases, 2001-2010

What is Plague?

- **Bacterium, *Yersinia pestis***
 - Known as the “Black Death”
 - Plague is infamous for killing millions of people in Europe during the Middle Ages
 - Presently, human plague infections continue to occur in rural areas in the western United States
 - Affects humans and other mammals, especially prairie dogs in Adams County. Cats are also more susceptible.



Transmission to People

- **Flea bites**

- Most common. This happens when people and animals visit places where rodents have recently died from plague.
- Dog and cats may bring plague-infected fleas into the home.

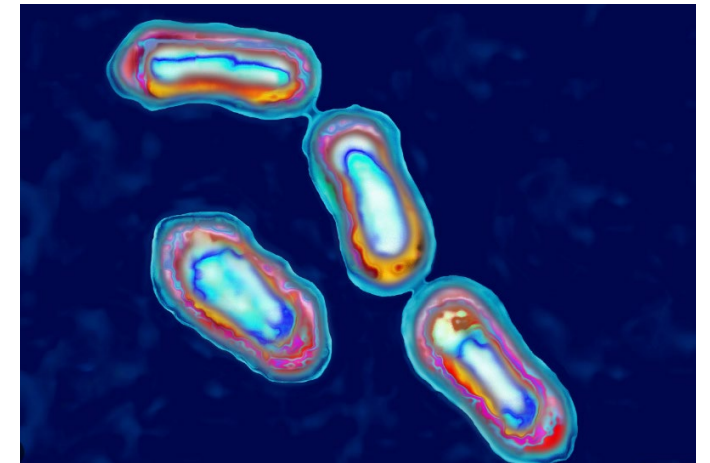
- **Contact with contaminated fluid or tissue**

- Handling tissue or body fluid of a plague-infected animal

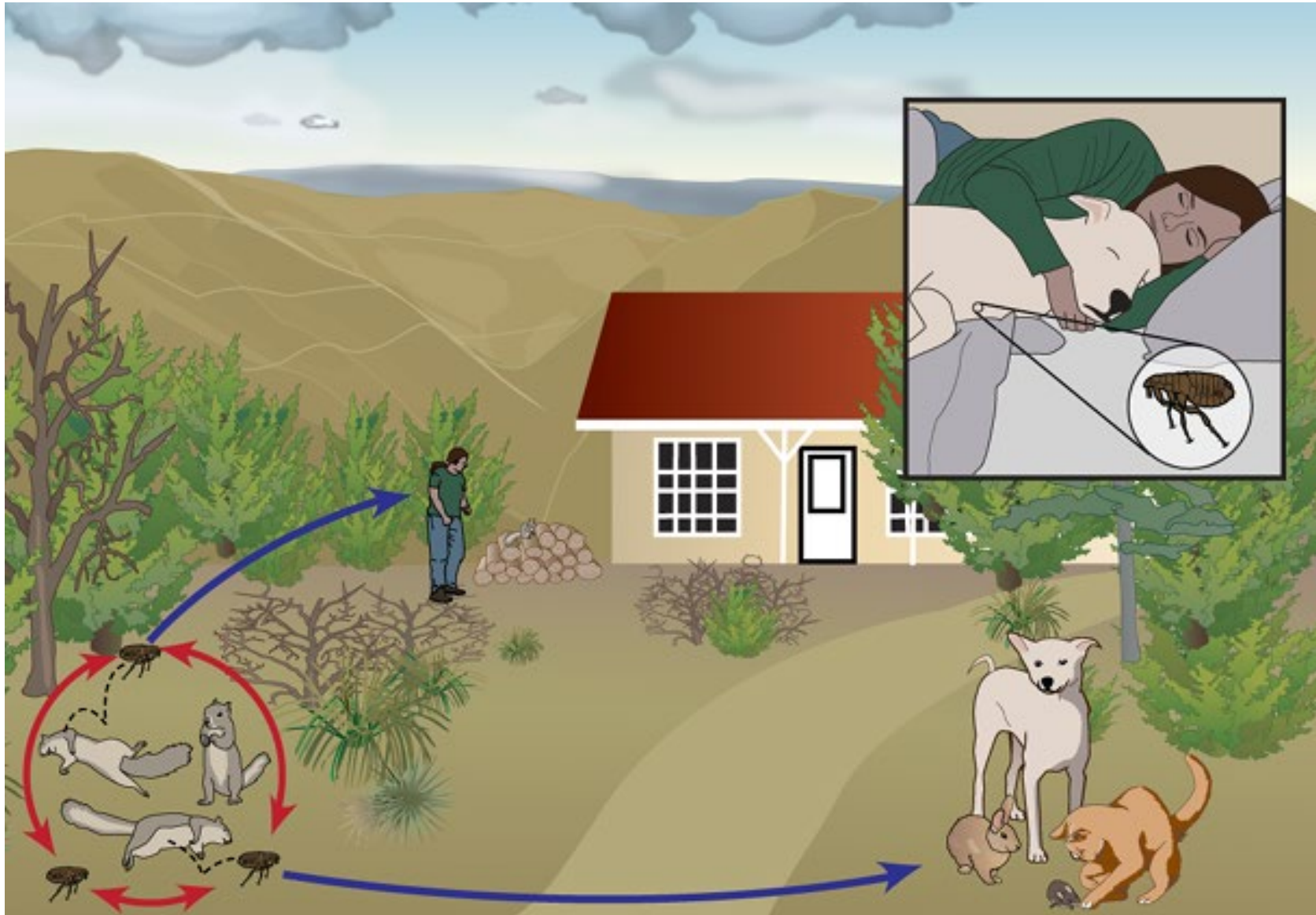
- **Infectious droplets**

- Breathed in by a person. Transmission of these droplets is the only way that plague can spread between people.

- **Bioterrorism**



Transmission



What are the Symptoms?

- **Symptoms depend on how the patient was exposed**
 - Generally flu-like symptoms accompany each form
 - Antibiotics are used to treat



Bubonic Plague
swollen lymph nodes



Septicemic Plague
skin and other tissues
may turn black and die



Pneumonic Plague
rapidly developing pneumonia

Prevention from Plague

- Reduce rodent habitat around your home, workplace, and recreational areas
- Wear gloves if handling or skinning potentially infected animals
- Use insect repellent (products containing DEET) if you think you could be exposed to rodent fleas
- Keep fleas off your pets by applying flea control products
- Do not allow dogs or cats that roam free in endemic areas to sleep on your bed
- If you notice areas where prairie dogs have rapidly disappeared, notify public health



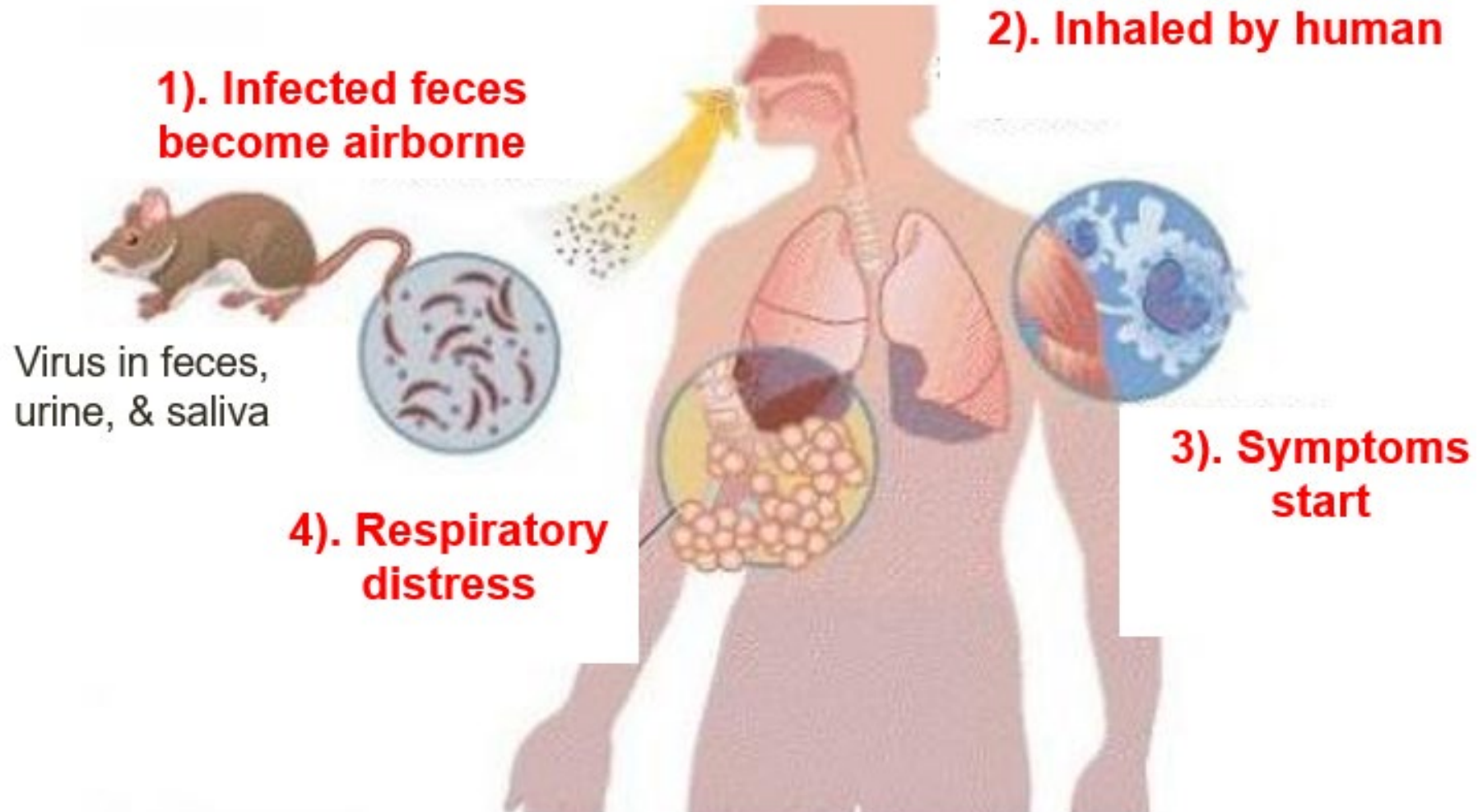
What is Hantavirus?

- Hantavirus Pulmonary Syndrome (HPS) is a severe, often fatal, respiratory disease
- Anyone who comes in contact with rodents that carry hantaviruses is at risk of HPS
- In Adams County, the Deer Mouse generally carries Hantavirus
- Can be found in a rodent's urine, feces, or saliva



Deer Mouse habitat in North America

Transmission



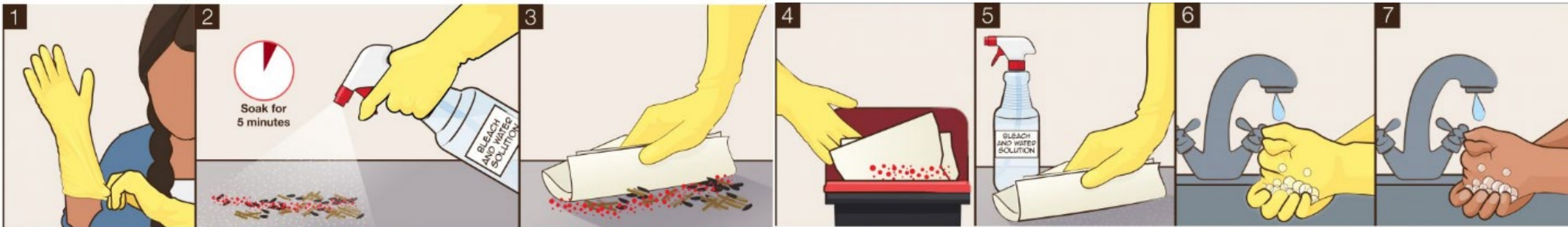
Prevention from Hantavirus

- **Keep rodents out of your home and workplace**
 - Seal up openings
 - Reduce food, water, and harborage areas
 - Monitor and trap rodents



Prevention from Hantavirus

- **Properly clean-up rodent droppings**
 - Do not sweep or vacuum!
 - Open doors and windows to circulate air
 - Wear a mask and gloves
 - Spray droppings with a disinfectant solution
 - Use paper towels to wipe up
 - Wash hands



Questions?



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