



# ZOO NOTIC DISEASE

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&  
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A disease that can be spread between animals and people

Zoonotic diseases can be caused by

- viruses
- bacteria
- animals (e.g., arthropods, nematodes, trematodes, cestodes, etc.)
- fungi

# WHAT IS A ZOO NOTIC DISEASE?



# WHY CONSIDER ZOOONOTIC DISEASE?

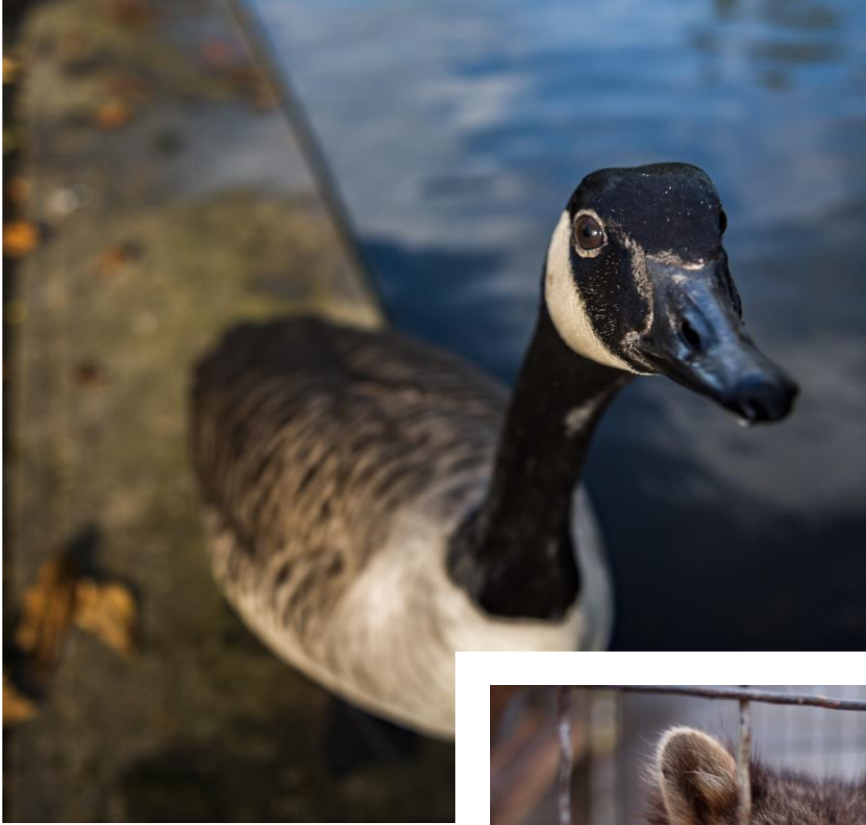
## Emerging Infectious Diseases (EIDs)

Infections that have recently appeared in a population or whose incidence and geographic range is rapidly increasing (or is expected to increase in the future)

60% of human EIDs are zoonotic in origin

75% of these originate from wildlife or wildlife has a role in their maintenance, transmission, and spread

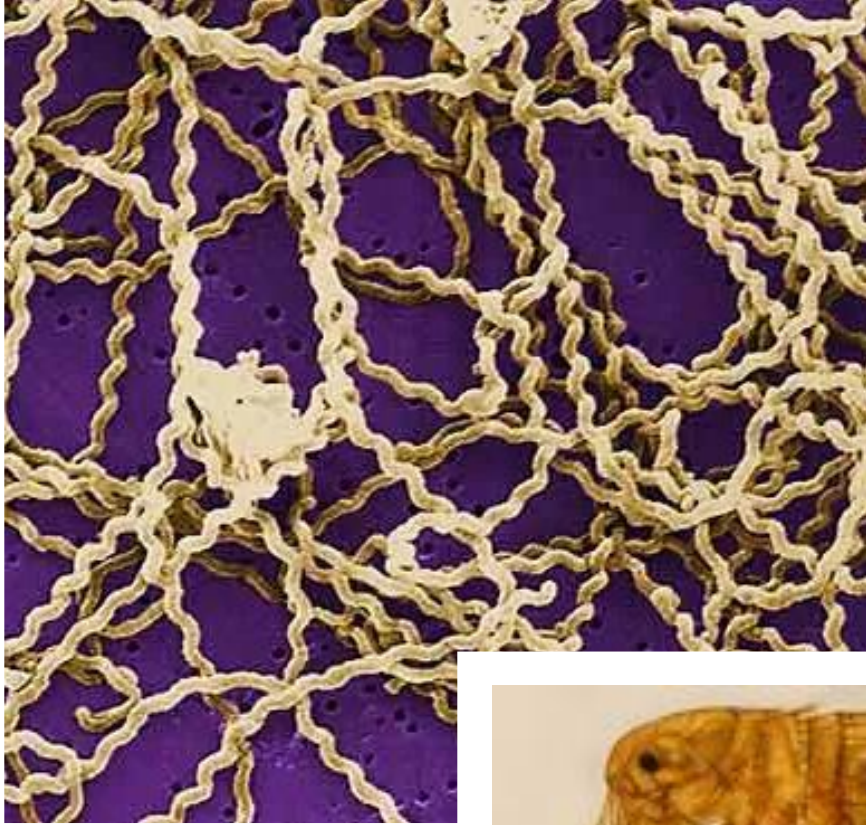




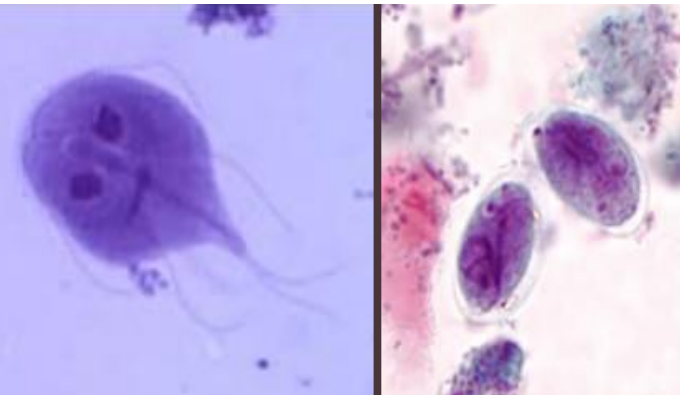
**YOUR  
PROFESSION  
IS HIGH RISK**

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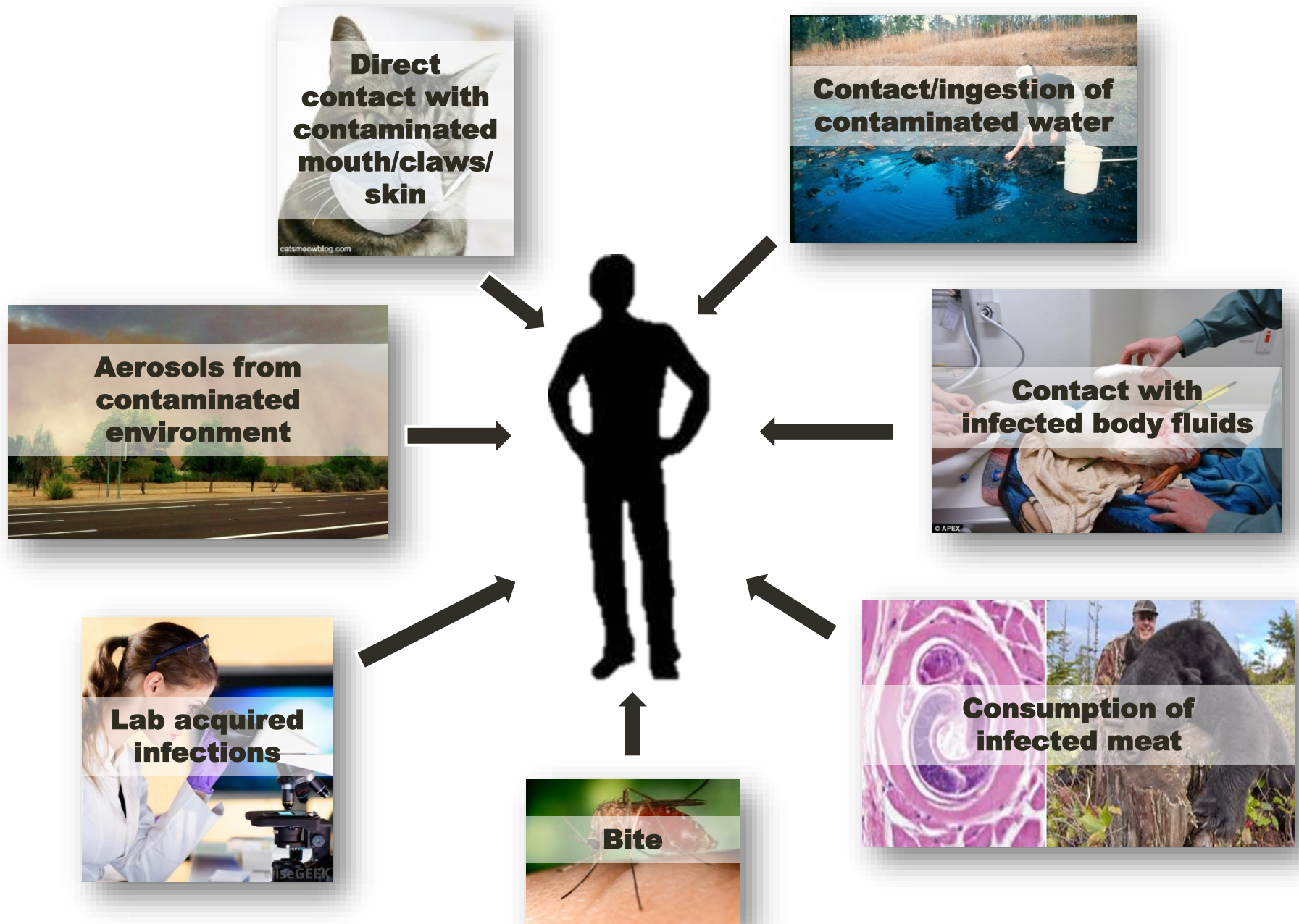




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# EXPOSURE ROUTES FOR ZOOONOTIC DISEASE



INFECTIOUS AGENT	ZOOBOTIC DISEASE	WILDLIFE SPECIES INVOLVED	MAIN ROUTE OF TRANSMISSION
<b>VIRUS</b>	Rabies	Mammals	Contact (usually a bite)
	West Nile Fever	Birds	Mosquito vector
	Hantavirus Pulmonary Syndrome	Deer Mouse (Peromyscus sp.)	Inhalation, ingestion
	Contagious Ecthyma (Ore-F, Orf)	Ruminants	Direct physical contact
	Plague	Rodents, Felids, others	Fleas, contact with infected tissues/fluid
	Lyme Borreliosis	Rodents	Tick vector
<b>BACTERIA</b>	Tularemia	Lagomorphs, Rodents	Vector, contact, inhalation
	Psitticosis (Chlamydia)	Birds	Inhalation
	Salmonellosis	Reptiles, Ruminants, Birds	Ingestion
	Leptospirosis	Rodents, Ruminants, Canids, Marine Mammals	Ingestion, contact with infected urine
	<b>PROTOZOAN</b>	Giardia	Most mammals
<b>HELMINTHS</b>	Hydatid Disease	Canid	Ingestion of parasite eggs
	Trichinellosis	Bears, Marine Mammals	Ingestion of poorly cooked meat
	Visceral Larva Migrans	Raccoons	Ingestion of parasite eggs
<b>FUNGI</b>	Coccidiomycosis (Valley Fever)	Environment, Infected Tissues	Inhalation, contact (rare)
	Ring Worm	Most Mammals	Contact

# HOW CAN YOU FIND INFORMATION ON DISEASES IN YOUR COUNTY?

As members of a high-risk profession, it is our responsibility to stay up-to-date on disease risks, transmission, current health guidelines and disease mitigation when handling wildlife.

The Wildlife Health Lab (<https://wildlife.ca.gov/Conservation/Laboratories/Wildlife-Health/Rehab#56235956-wildlife-rehabilitation>)

California Department of Public Health (<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/ZoonoticDiseases.aspx>)

Center for Disease Control (<https://www.cdc.gov/onehealth/basics/zoonotic-diseases.html>)

- [SARS-COV-2 Guidance for people who work with animals](#)

The World Health Organization (<https://www.who.int/news-room/fact-sheets/detail/zoonoses>)

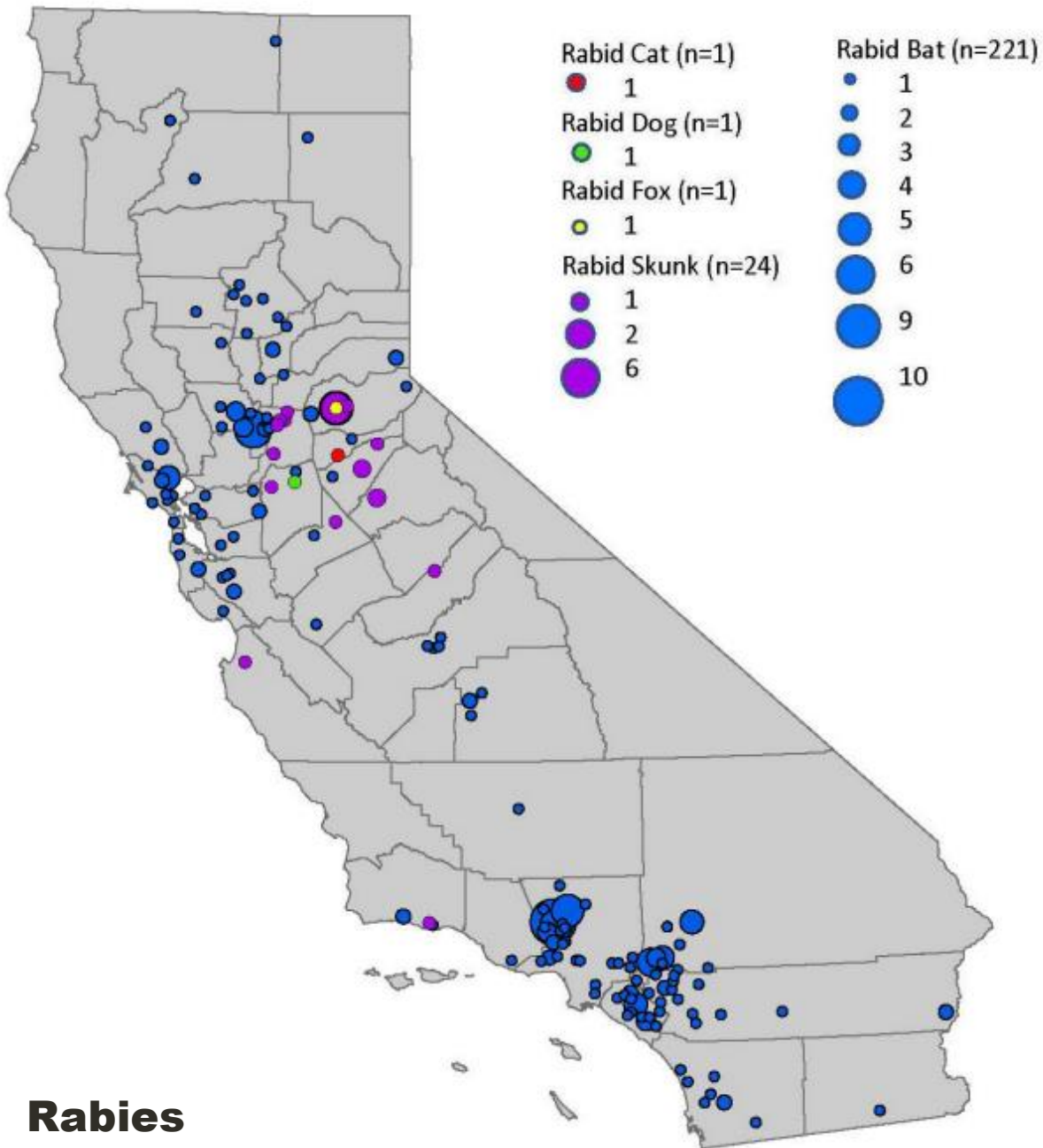
Mosquito & Vector Control Association of California (<https://www.mvcac.org/>)

Association for Biosafety and Biosecurity (<https://absa.org/>)

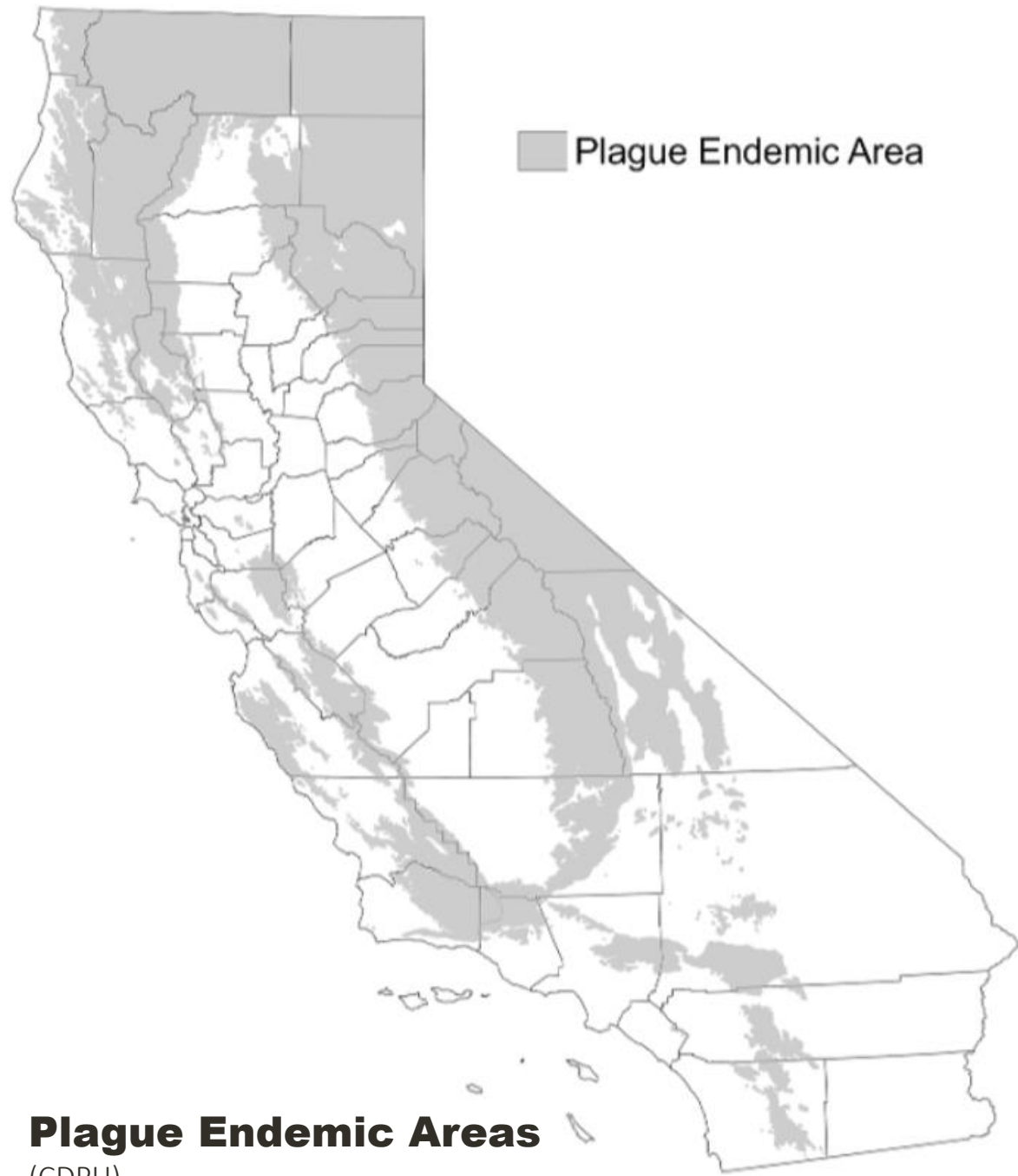
CDFW News, other agencies, and local news will report on outbreaks

Other Websites with “California + Zoonotic Disease” as the search words

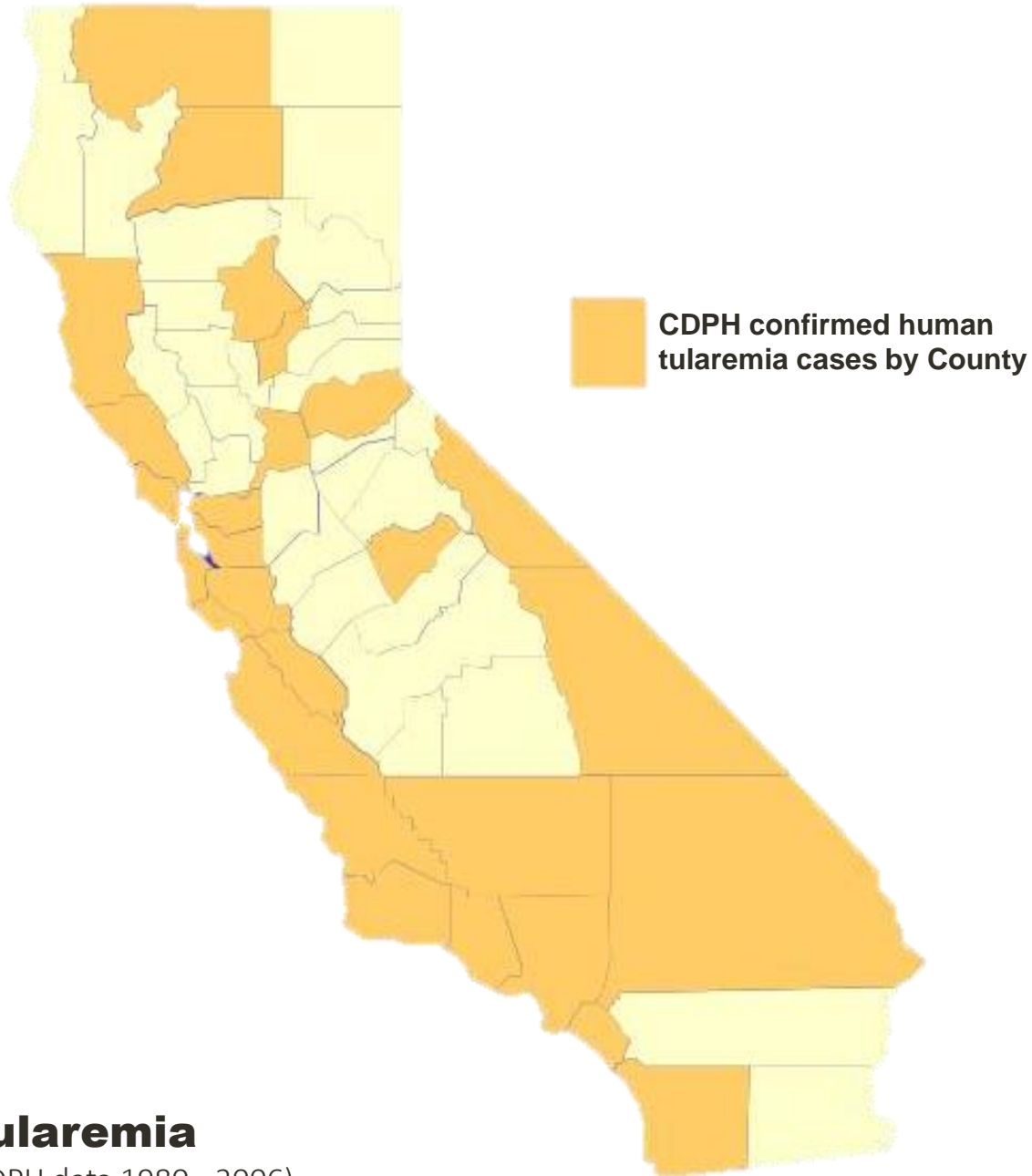




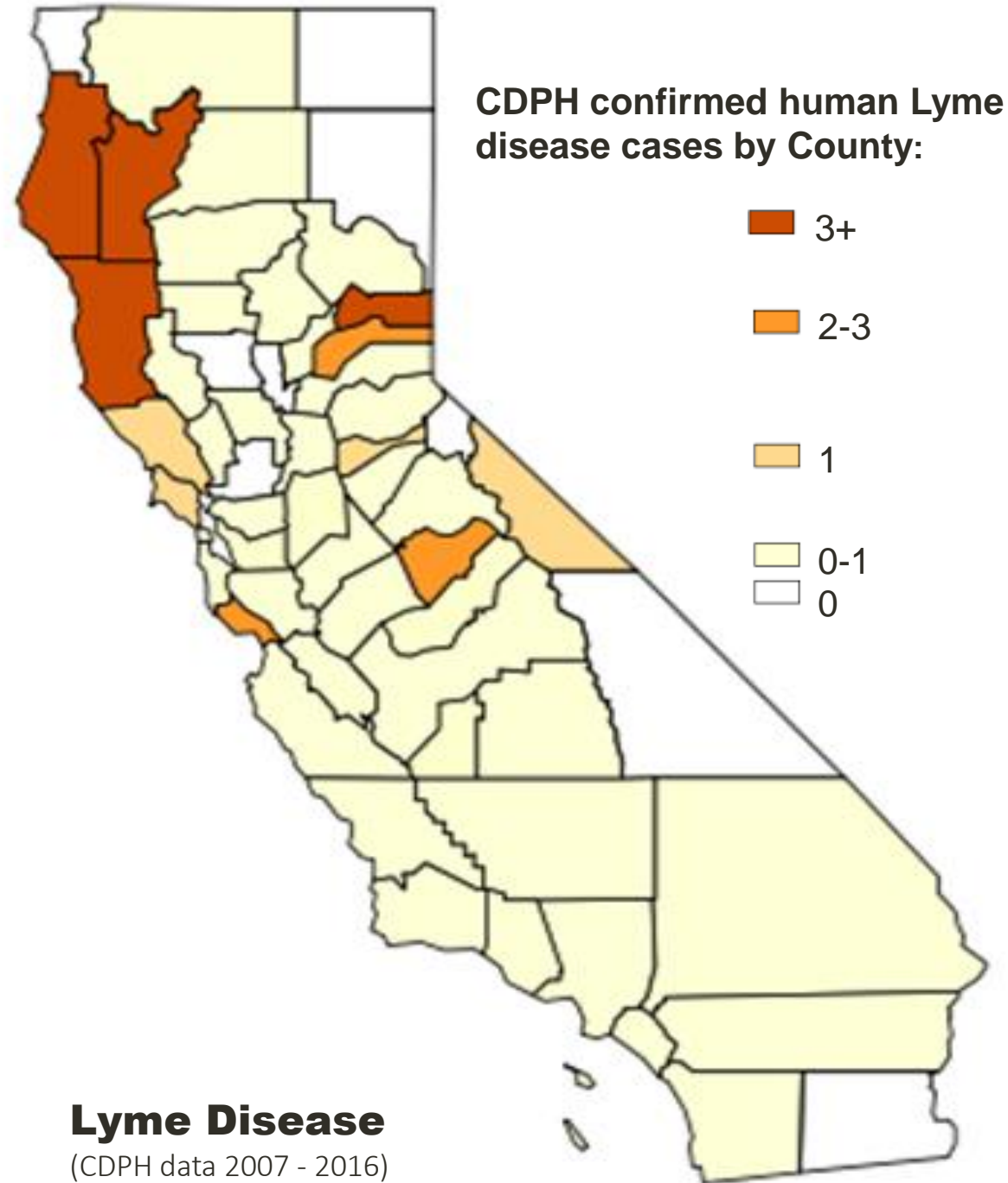
**Rabies**  
(CDPH cases 2020)



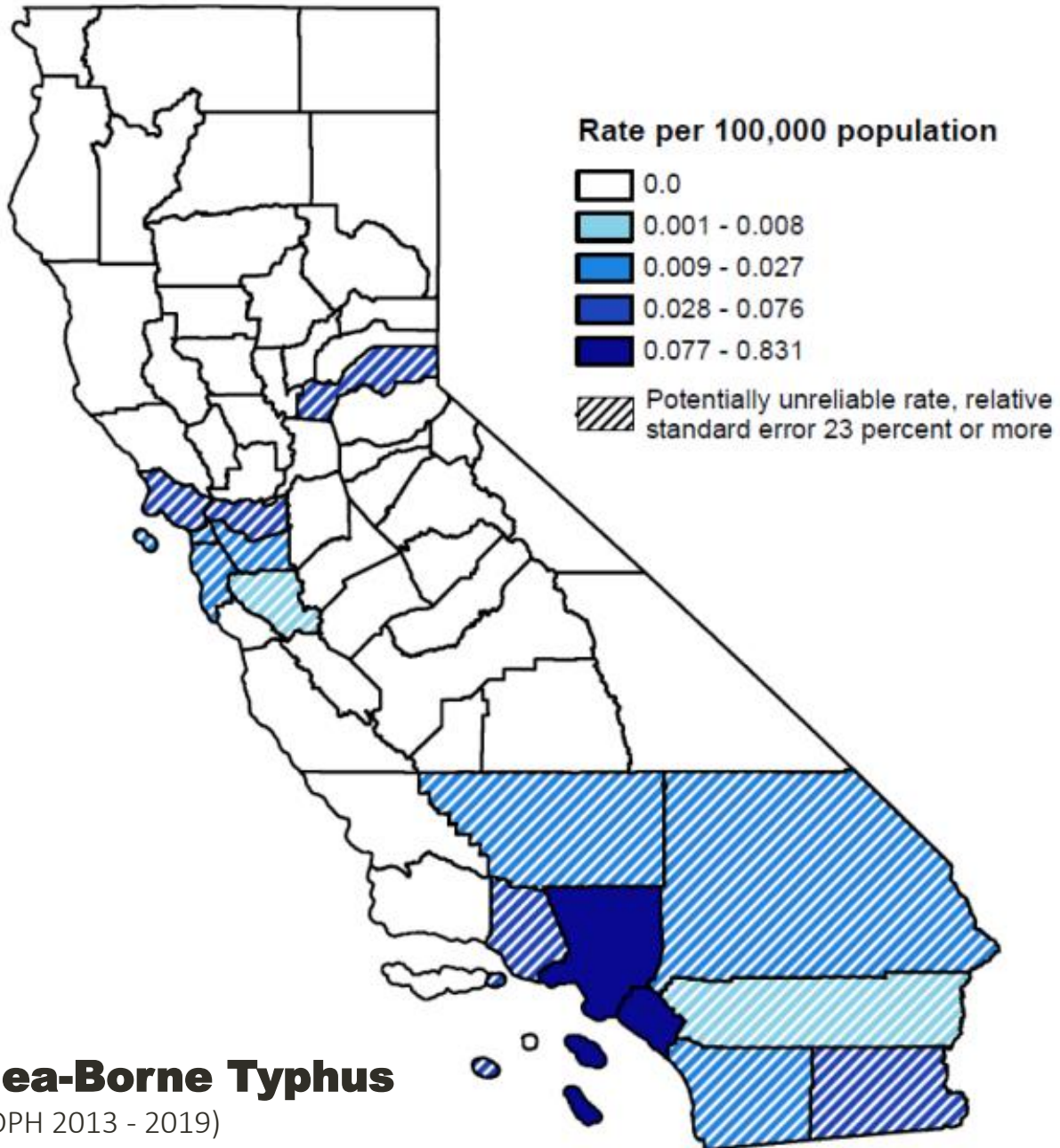
**Plague Endemic Areas**  
(CDPH)



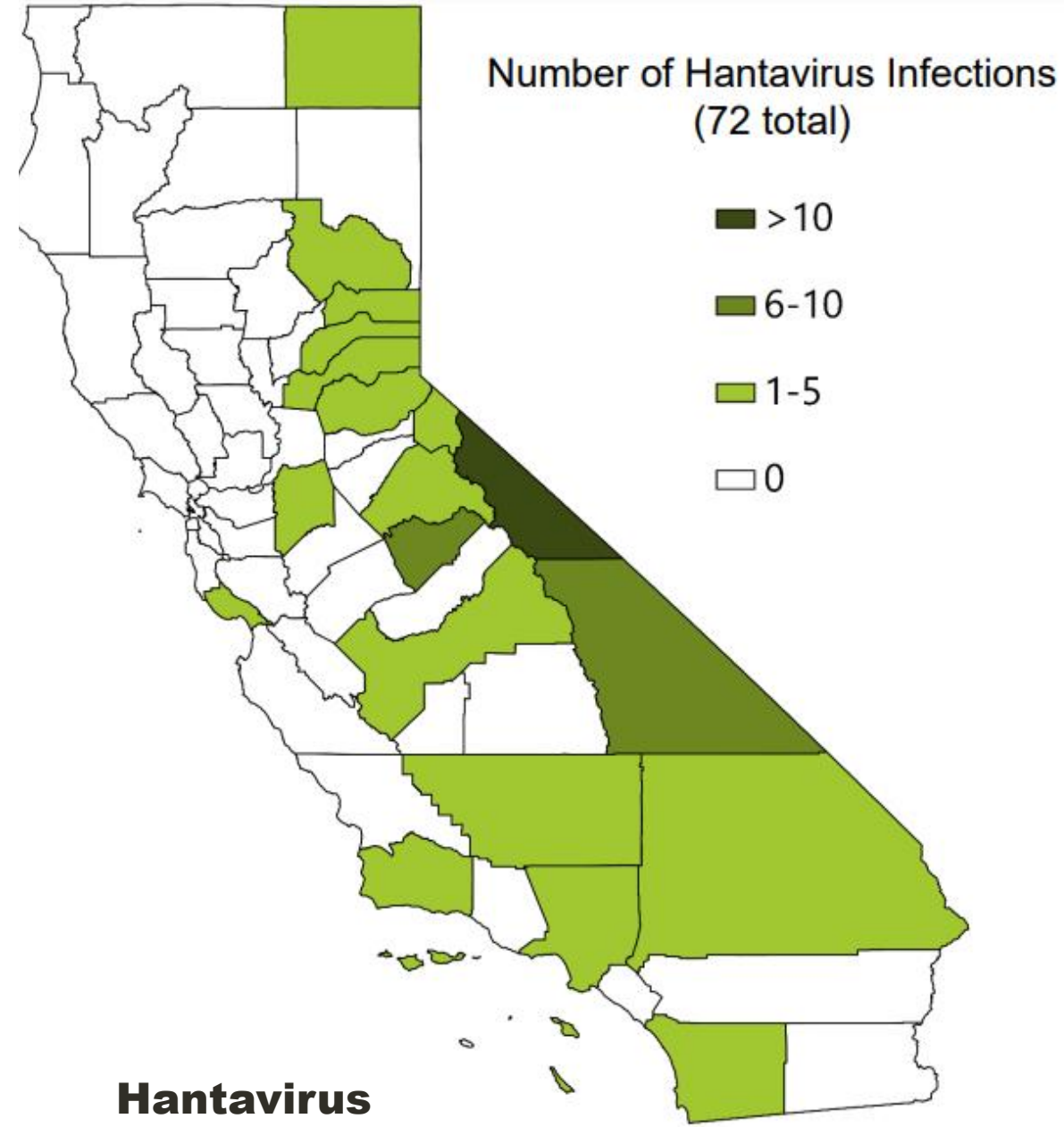
**Tularemia**  
(CDPH data 1980 - 2006)



**Lyme Disease**  
(CDPH data 2007 - 2016)



**Flea-Borne Typhus**  
(CDPH 2013 - 2019)



**Hantavirus**  
(CDPH data updated January 2021)





**DISEASE  
SYMPTOMS  
(IN PEOPLE)**

Asymptomatic

Fever

Malaise

Fatigue

Rash or Skin Necrosis

Anorexia

Vomiting/Diarrhea

Coughing

Sneezing

Organ Failure

Death



Image from Greenwood Wildlife Rehabilitation Center

# AVOIDING ZOO NOTIC DISEASE

- Treat all animals as if they have a zoonotic disease
- Know what diseases occur in the species and habitat
- Use of protective clothing and PPE – e.g., gloves, mask, goggles, protective clothing, rabies vaccine
- Avoid direct contact with abnormal skin on wildlife, secretions, urine, and feces
- Practice good hygiene (e.g. hand washing)
- PPE
- Have a healthy respect for rodents
- Seek medical advice if you become ill after handling wildlife (and public health)
- PPE



## CONSIDER RISK TO WILDLIFE (REVERSE ZOOONOSIS)

- Spanish Imperial Eagles (threatened)
- Ferrer and Hiraldo (1995)
- Reported high occurrence of *S. aureus* **infection** in nestling (common cause of skin infections)
- Nestlings handled without gloves had 45% occurrence of *S. aureus*
- Nestlings handled with disposable gloves had 4% occurrence of *S. aureus*





2013 Infections/Exposures

609 Outbreaks

2.8% Case Fatality Rate

? Infection/Exposure definitions

- species (e.g. cat)
- families (e.g. Felidae)
- value
- disclaimer



<https://vis.csh.ac.at/sars-ani/>

# REVERSE ZOOONOSIS & SARS-COV-2

## Handling Bats

Must wear PPE (face mask/gloves) when handling & contact CDFW about potential release

## Handling Carnivores

Should wear PPE

## Handling Other Species

PPE strongly recommended

# ASSOC. OF FISH & WILDLIFE AGENCIES

Document that provides potential risk mitigation strategies for wildlife scientists, biologists, hunters, trappers, and wildlife control operators that come in direct contact with wildlife.

## COVID-19 and North American Species of Mustelidae, Felidae, and Canidae

*Prepared by the Fish and Wildlife Health Committee of the Association of Fish and Wildlife Agencies*

Recent reports have indicated that several species of the families Mustelidae, Felidae, and Canidae are susceptible to infection by SARS-CoV-2, the causative agent of COVID-19, under non-laboratory conditions. These include the domestic dog, domestic cat, Malayan tiger, Amur tiger, African lion, domestic ferret, and farmed mink. Among captive or domestic animals, the limited available evidence suggests that certain species of captive or domestic Felidae and Mustelidae are more efficient hosts of viral replication, while the very small number of documented infections in domestic dogs worldwide suggests that domestic Canidae may be less susceptible to infection. None of the infections that have been detected to date were from wild free-ranging animals, and currently there is no evidence of a wildlife reservoir for SARS-CoV-2 involving species in North America. Although susceptibility has been established in these few species, there is insufficient information to fully evaluate potential animal-to-human transmission (zoonosis) risks or human-to-animal transmission (reverse zoonosis) risks associated with handling or contact with wild free-ranging animals in these families. Based on our current understanding of transmission pathways, the infection appears less likely to spread among animals with a solitary lifestyle (as occurs with many mustelids and felids) than among animals that live in social groups. There is no evidence at this time that such infections, if they occurred in individual wild mustelids, felids, or canids, would necessarily be maintained in populations of these species, or that SARS-CoV-2 would cause significant disease if established in these species. However, given the novel and unpredictable nature of SARS-CoV-2, these possibilities cannot be totally discounted and certainly warrant further investigation.

There are two potential transmission risk scenarios that may be of concern to stakeholders and biologists: 1) humans acting as a source of infection to mustelid, felid, and canid species and 2) SARS-CoV-2 infected mustelids, felids, and canids acting as a source for human infection. As humans currently represent the major reservoir for SARS-CoV-2 and no evidence exists that this virus is present in wild mustelids, felids, or canids in North America, the risk of transmission from a wild animal to human should not be of concern at this time. The potential for reverse zoonosis, however, may be valid, particularly in contexts such as rehabilitation, wildlife exhibition, and captive animal research where humans and animals may interact in close proximity for extended periods of time. Resources referenced at the end of this document provide additional guidance on risk mitigation strategies for such situations where humans will be in contact with live animals for extended periods of time.

A young child with blue eyes is looking at the camera. A spotted fawn is in the foreground, and a black dog with a red collar and tag is behind it.

**QUESTIONS?**

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# Reminders about possible bat rabies cases

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Free-Ranging Wildlife Health Resident

# Rabies in Californian Bats:

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Signs can be subtle / vague:

- Ataxia \*
- Aggression
- Mental dullness \*
- Difficulty swallowing / drooling
- Paresis / Paralysis \*
- Agitation and hypersensitivity to stimuli
  - sound, light, etc
- Abnormal behavior \*
  - Active during daytime
- Abnormal vocalizations
- Weight loss \*



Image source: maine.gov

\* indicate clinical signs that are also often seen in head trauma cases

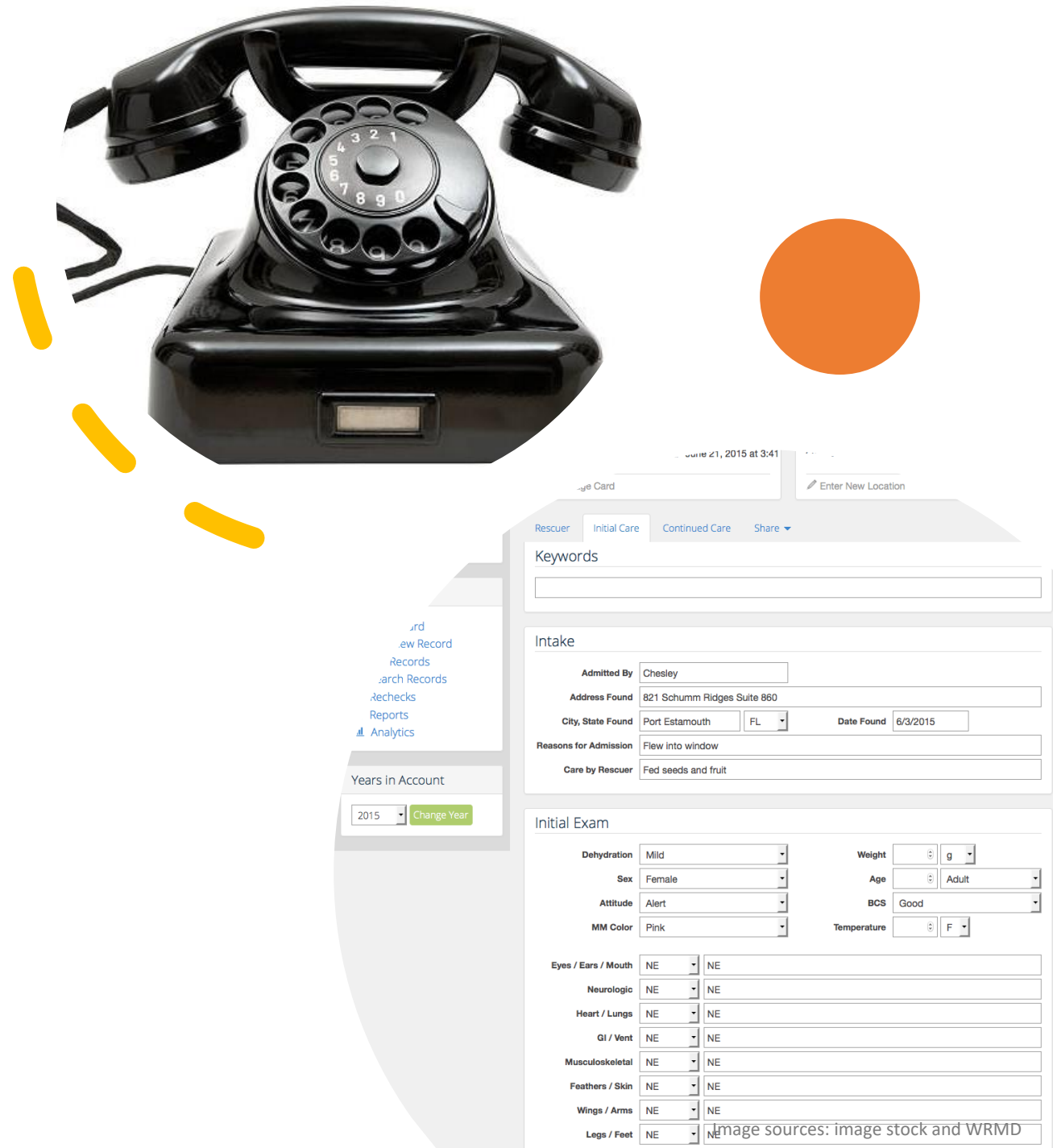


# Rabies in Californian Bats:

STEP 1) Regardless of documented 'exposure', if signs are noted in a bat patient, contact the public health dept of the bat's county of origin to inquire if PHD would like to have tested

STEP 2) If testing is declined by public health, must DOCUMENT in the medical record.

Due to the public health risk, rabies suspect bats should be primarily done by public health department





# Rabies in Californian Bats:

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Goal of these guidelines is ***not*** to euthanize more 'healthy' bats

But must take risk of rabies very seriously

Do not want suspect cases to not be tested OR have delayed testing and reporting



# Rabies in Californian Bats:

## Other Reminders:

- Important to have a Rabies Vector Species Form filled out with every RVS upon intake
- If not filled out by the member of the public, must call and follow up
- If your facility does not have a version of this form, please let us know, WHL can provide you with a template



## RABIES VECTOR ADMISSION FORM

(To be used in conjunction with a LWE WRMD medical record)

### RABIES INFORMATION

Bats, skunks, foxes and raccoons are rabies vector species. Rabies is an infectious viral disease that affects the nervous system of humans and other mammals. Humans can contract rabies from the bite of a rabid animal (one infected with rabies). It is also possible, but quite rare, that humans may contract rabies if infectious material from a rabid animal, such as saliva, gets directly into their eyes, nose, mouth or an open wound. Rabies is NOT transmitted through feces, blood, or urine.

You should contact your local health department if you have been bitten by the animal or if infectious material such as saliva from the animal has gotten into your eyes, nose, mouth, or an open wound, or if the animal has been found in a room with a person who cannot reliably rule out contact, such as a sleeping person, a child, a mentally disabled person, or an intoxicated person\*. If your dog, cat, or other household pet has come into contact with the animal, you should contact your veterinarian.

### RABIES VECTOR ADMISSION WAIVER

To the best of your knowledge...

- 1: Has this animal been touched by you or another person's bare skin?  Yes  No  
2: Has this animal bitten a human?  Yes  No  
3: Was this animal found inside a home?  Yes  No  
3: Has a child been exposed to the animal?  Yes  No  
4: Has a mentally disabled person been exposed to the animal?  Yes  No  
5: Has an intoxicated person been exposed to the animal?  Yes  No  
6: Has a sleeping person been exposed to the animal?  Yes  No

If yes to 1-6, explain: \_\_\_\_\_

Person's name: \_\_\_\_\_ Age: \_\_\_\_\_ Phone: \_\_\_\_\_

- 7: Has this animal bitten a personal pet?  Yes  No  
8: Has this animal been touched by a personal pet?  Yes  No

If yes to 7-8, Pet's name: \_\_\_\_\_ Last Rabies shot date: \_\_\_\_\_

**By signing below, I state that all of the above information is correct.**

NAME: \_\_\_\_\_ PHONE: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

To be completed by LWE:

DATE: \_\_\_\_\_ SPECIES: \_\_\_\_\_ ID#: \_\_\_\_\_



## Caution with other RVS:

Other species also can test positive...

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Two cases in the last 30 days in foxes:

- Gray fox in Humboldt Co
- Gray fox in Plumas Co

