# Animal Disease Surveillance Report 2016

Los Angeles County | Veterinary Public Health

**Los Angeles County Department of Public Health**
Barbara Ferrer, PhD, MPH, Med, Director
Jeffrey D. Gunzenhauser, MD, MPH, Interim Health Officer
Robert Kim-Farley, MD, MPH, Director, Communicable Disease Control and Prevention

**Veterinary Public Health Program**
Karen Ehnert, DVM, MPVM, DACVPM, Director, Veterinary Public Health
Jamie Middleton, DVM, MPH, MS, Deputy Director, Veterinary Public Health

**Veterinarians** (in alphabetical order)
Emily Beeler, DVM, MPH
Cynthia Chan, DVM
Michelle Chang, DVM, MPH
Mellissa Jae, DVM
Tamerin Scott, DVM, MPH, DACVPM

**Field and Investigative Staff** (in alphabetical order)
Rosa Arredondo
Jackaleen Chapman
Cornelious Chisom, Jr.
Stacy Christianson
Radhika Desai-Zamora
Mark Rubalcava
Rafael Sepulveda

**Health Educator**
Christina Johnson

**Epidemiology Analyst**
Askari Addison

**Administrative Staff**
Yulya Ghazaryan
Marlon Chavez
Thelma Mitchell
Schannel Strong

**Other contributors**
Gaël Lamielle, DVM, MPH, DACVPM, Alexandra Swanson, DVM, Asundep Ntui, DVM, MS, DrPH, Erica Ambeba, Jennifer Lam, Hayley Ashbaugh, DVM, MPH, DACVPM, Orlando Mangahis, Gabriela Sandoval.

**Veterinary Public Health Program, Los Angeles County Department of Public Health**
313 N. Figueroa St., Rm 1127, Los Angeles, CA 90012
Tel: 213-288-7060, Fax: 213-481-2375
vet@ph.lacounty.gov
www.publichealth.lacounty.gov/vet

# Table of Contents

## Message from the Director

I am pleased to present the Los Angeles County Department of Public Health, Veterinary Public Health (VPH) Program's 2016 Animal Disease Surveillance Report. This document adds to the data published in two previous Animal Disease Surveillance Reports. It provides the reader with an analysis of the most commonly reported diseases affecting local pets and wildlife in Los Angeles (LA) County, as well as summaries regarding a few unique and unusual animal diseases.

Our department recognizes that human, animal and environmental health are intricately linked, a concept called One Health.[1] There are some diseases that spread from animals to people (zoonotic diseases), and a few that spread in the opposite direction (reverse zoonotic diseases). Three of every five new infectious diseases affecting humans originated in animals.[2] With approximately 40% of people in the County having at least one pet,[3] and wildlife often living in close proximity to homes, human-animal interactions are common. Therefore, tracking and controlling infections in pets and wildlife may help reduce the risk of certain diseases in humans. It also provides our agency with a baseline understanding of local natural disease cycles in animals, information which is critical when assessing potentially new or emerging diseases, or bioterrorist attacks affecting animals.

LA County has one of the most comprehensive animal disease surveillance programs in the nation. The basis for the program is our county's unique animal disease reporting ordinances; however, effective surveillance would not be possible without the support of our many partners. These include local veterinarians, animal control agencies, wildlife experts, vector control specialists, animal diagnostic laboratories, the Los Angeles Quarantine Station of the Centers for Disease Control and Prevention (CDC) at the Los Angeles International Airport, and many others.

This document provides further evidence of the importance of integrating human and animal disease surveillance and the promotion of public health from a One Health perspective in LA County, uniting the fields of human, animal and environmental health.

Sincerely,

Karen Ehnert, DVM, MPVM, DACVPM
Director
Veterinary Public Health Program
Los Angeles County Department of Public Health

# Background

## 1. About Veterinary Public Health

**Mission**

*To take advantage of the relationships between human and animal health in order to promote a healthy community environment for residents of LA County.*

**Vision**

*The residents of LA County are protected from zoonoses and animals are free of reportable diseases.*

---

**Animal disease surveillance and outbreak investigations.** The Veterinary Public Health (VPH) Program performs animal disease surveillance for Los Angeles (LA) County. VPH is an integral part of the Los Angeles County Department of Public Health (DPH), serving all of LA County, except for cities that operate under their own health departments: Long Beach, Pasadena and Vernon. The program is staffed by veterinarians, animal sanitation inspectors, a registered veterinary technician, administrative staff, a health educator, and an epidemiology analyst.

LA County has unique animal disease reporting requirements. After a devastating foot-and-mouth disease outbreak in local livestock in the 1920s, a wide-range of animal disease reporting ordinances were passed. These ordinances stated that all infectious diseases in animals were reportable.[4] Such laws enabled better detection, control, and prevention of diseases in animals. As the county urbanized and the amount of livestock declined, disease surveillance in animals also declined. After the anthrax attacks on people in the United States in 2001, concerns grew about bioterrorism threats, including those from infectious diseases that could infect both people and animals.[5] VPH re-instituted the legal requirement that local veterinarians report infectious diseases in animals, including pets (companion animals). To further improve disease tracking, in 2007 VPH created a Reportable Disease Priority List, which was last updated in 2016 (Appendix). Readers can review both the human and animal disease reporting requirements for LA County at publichealth.lacounty.gov/cdcp/proreporting.htm. Additionally, the California Department of Public Health requires reporting of six diseases in all animals: anthrax, brucellosis (except *B. canis*), plague, rabies, tularemia, and viral hemorrhagic fevers (e.g., Crimean-Congo, Ebola, Lassa and Marburg viruses).[6]

Veterinary practices and animal control agencies are the eyes and ears of the community when it comes to detecting animal diseases. Reporting by veterinarians has allowed VPH to uncover trends and discover new diseases in a way that is unique to LA County. These data inform veterinarians about diseases that are circulating in the community. It may also guide clinical decisions on testing, treatment and prevention of disease in animals. In addition, these data can inform physicians about local zoonotic and vector-borne diseases to which their patients may be exposed, including emerging infectious diseases.

**Pets imported from abroad.** Imported animals may carry diseases that can subsequently infect people and other animals in the United States.[7] VPH assists federal authorities at the Los Angeles International Airport (LAX) to ensure that dogs entering the county are healthy and are accompanied by accurate paperwork. During visual inspections, it is not unusual for VPH staff to identify instances of fraudulent documentation (e.g. describing the animals as older than their actual age), presumably to avoid federal quarantine (see p.

46). VPH also hosts quarterly meetings to bring together multiple agencies to discuss animal importation concerns, including the variety of species being imported, the diseases that may be imported, and humane issues that arise for the animals themselves.

## 2. Abbreviations, Definitions and Technical Notes

*Abbreviations*

CDC – Centers for Disease Control and Prevention

CDPH – California Department of Public Health

DFA – Direct Fluorescent Antibody

LACDPH – Los Angeles County Department of Public Health

ELISA – Enzyme-linked immunosorbent assay

LA County – Los Angeles County

LAX – Los Angeles International Airport

MRSA – Methicillin-resistant *Staphylococcus aureus*

PEP – Post-exposure prophylaxis

PCR – Polymerase chain reaction

USDA – United States Department of Agriculture

VPH – Los Angeles County Department of Public Health, Veterinary Public Health Program

WNV – West Nile virus

### Data Sources

Most data are obtained from disease reports from veterinary practices and animal shelters in the jurisdiction of LACDPH. Diseases in animals in Long Beach, Pasadena and Vernon are occasionally reported by veterinarians LACDPH's jurisdiction, and these cases are included. Data on rabid bats and canine parvovirus is received directly from animal control agencies in Long Beach and Pasadena and is included in this report. Additional data is received from two veterinary diagnostic laboratories. The California Department of Public Health provides data on West Nile virus (WNV) in dead birds for the entire County of Los Angeles. Finally, some data are obtained from disease investigations and surveys.

### Case Definitions

A case definition is a set of criteria used to evaluate reported cases of a disease and determine how they should be counted. Each disease has its own case definition. Cases are categorized as "confirmed," "probable" or "suspected" based on the level of laboratory, clinical, and epidemiologic evidence that the animal has the disease. Laboratory test verification is required for a case to be considered confirmed. VPH is

currently the only public health program in the United States consistently tracking numerous infectious diseases in companion animals. Therefore, this program has established case definitions for multiple animal diseases described in this report.[8] Exceptions are: rabies, West Nile virus (WNV), and psittacosis. These diseases are also tracked by state and Federal programs, and case definitions for these diseases in animals already existed.[9-11] Case definitions for diseases tracked by VPH are available at: publichealth.lacounty.gov/vet/surveillance.htm

### Types of Animal Disease Data


**Directly-transmitted zoonotic disease**. Zoonotic diseases (or zoonoses) can infect both humans and animals and can be transmitted between humans and animals. According to the Centers for Disease Control and Prevention (CDC), about 60% of infectious diseases infecting humans emerged from animals.[12] Examples from this report include rabies and leptospirosis.


**Vector-borne.** Vector-borne diseases are infections transmitted to people and animals by arthropods such as fleas, ticks or mosquitoes. Examples from this report include heartworm disease and WNV.


**Environmental.** Environmental diseases are those transmitted to people and animals from a common source in the environment. An example from this report is the fungal disease valley fever (coccidioidomycosis) which is transmitted to people and to animals from soils in some areas.


**Sentinel**. Sick animals can serve as sentinels, or warnings that a disease may be present nearby. Dead birds diagnosed with WNV can help identify areas in the community where the risk of exposure to the disease is higher.


**Reverse zoonosis.** Reverse zoonotic diseases are those primarily transmitted from people to animals. An example from this report is methicillin-resistant *Staphylococcus aureus* (MRSA).


**Animal disease only.** Although animals and humans may suffer from the same diseases, many infections of pets are not transferred to people. An example from this report is canine parvovirus.

**Counts versus Rates**

Most animal disease data in this report are reported as raw case counts instead of rates. Because there is no census for animals, the total number of animals in LA County is unknown. Therefore, disease rates and percent cannot be accurately calculated.

**Under-Reporting and Reporting Delays**

Under-reporting is a problem with surveillance of both human and animal diseases. Therefore, reported data typically reflect the minimum number of cases. Factors contributing to under-reporting include the following: misdiagnosis; animals with mild illness not seen or tested by a veterinarian; owners declining to pay for diagnostic tests; veterinarians neglecting to report diseases; or cases of disease reported months or years after they initially occurred. These factors may further complicate analysis.

**Disease Dates**

Animal diseases are tracked by the date the animal was first presented to a veterinarian in LA County for evaluation for the condition. In contrast, human disease is typically tracked by the date of onset of illness. The date of disease onset is often unclear in animals, since clinical signs may remain undetected until they are overt or at an advanced stage.

**Incidence versus Prevalence**

Animal disease data in this report consist of new cases reported within the year (incidence), as opposed to the total number of cases present at a given time (prevalence). Note: the animal disease data is not reported in incidence *rates*, since the total population of animals is not available.

**Geographic Trends**

Some cases of disease reported in LA County may have been acquired outside of the County. For several diseases, such as heartworm disease in dogs and cats, the animal's history is evaluated to determine whether the disease was locally acquired.

For the purpose of geographic information in this report, the southern California area is considered to include the following counties (in alphabetical order): Imperial, Kern, Los Angeles, Orange, Riverside, San Bernardino, San Diego, San Luis Obispo, Santa Barbara, and Ventura.

VPH is the only program in the country consistently tracking companion animal diseases; therefore, comparing local animal disease data trends with other jurisdictions (state or national) is difficult or not possible.

## 3. Surveillance Methods

A surveillance system is a way of monitoring disease conditions and events which affect a community's health. Disease data is reported, analyzed and then shared with the public so that protective actions can be taken.[13]

The majority of data in this report are derived from *passive surveillance*, which is dependent upon veterinarians (and as of 2014 – veterinary laboratories) reporting specific diseases. Animal health professionals submit case reports of animal diseases, which VPH then analyzes and summarizes so that the data may be utilized by the public. Because passive surveillance systems require community participation, many cases of animal disease are likely to be unreported. Therefore, the data in this report describe the minimum amount of disease present locally. VPH occasionally performs *active surveillance* by conducting surveys, some of which are published elsewhere.[14]

At the beginning of 2014, VPH began Electronic Laboratory Reporting (ELR) for three conditions in animals: heartworm infection, Valley fever (coccidioidomycosis), and leptospirosis. Veterinary diagnostic laboratories performing certain tests for these diseases on animals from LA County began reporting positive results to VPH electronically. VPH followed up on each ELR report by contacting the veterinarian caring for the animal to request a full case report. The use of ELR significantly increased the amount of available data for these three conditions. VPH plans to expand the number of animal diseases tracked by ELR in the future. Numerous human diseases in LA County are tracked the same way. For a complete list of human diseases tracked by ELR, visit: publichealth.lacounty.gov/cdcp/proreporting.htm.

Reporting and participation by local veterinarians in disease surveillance has allowed for the uncovering of trends and the discovery of new pathogens in a way that is nearly impossible in areas where animal disease reporting laws do not exist. This disease tracking program has also been of direct benefit to local veterinary practices. Disease reporting allows veterinarians to inform their peers about diseases they have been seeing, uncover local disease risks, identify emerging threats, and provide an evidence base for recommended tests, treatments and preventive medications.

VPH also provides access to diagnostic testing of animal specimens in certain situations to enhance surveillance. For example, through 2016, the program continued to arrange for free rabies testing of neurologic or biting animals. VPH also offered free necropsies and other diagnostic testing in cases where a potential disease outbreak was identified (three or more animals affected), or when an emerging, dangerous or foreign pathogen was suspected. Updated information on the disease surveillance services offered by VPH is available at: publichealth.lacounty.gov/vet.

# 2016 Data Highlights for LA County

## Zoonotic Diseases

### Rabies

**38** Rabid bats found in 2016

**10** Rabid bats found indoors in 2016

**3** Rabid bats found at schools in 2016

### Heartworm*

**86** Cases reported in 82 dogs and 4 cats in 2016

**23%** Of cases in 2016 had no travel outside of southern California.

**79%** Of cases in 2016 were asymptomatic when diagnosed

### Leptospirosis *

**14** Cases reported in dogs in 2016

**29%** Of cases in 2016 were likely infected via wildlife exposure in their own yard.

**73%** Of cases in 2016 had not been vaccinated against the leptospirosis.

## Sentinel Diseases

### Valley Fever (Coccidioidomycosis)*

**22** Cases reported in 21 dogs and 1 cat in 2016

**43%** Of cases in 2016 had not traveled outside of Southern California.

**18%** Of cases in 2016 lived near a location with recent earth excavation

* Excludes cities of Long Beach and Pasadena. See page 4 for more information.

## West Nile virus (WNV) in Dead Birds

**124** Cases reported in 2016

**66%** Of all dead birds tested in 2016 were WNV-positive.


**74%** Were detected in in June-August 2016.

## Non-Zoonotic Diseases

### Parvovirus in Dogs

**545** Cases reported in 2016

**34** Animal Shelters and veterinary practices reported cases in 2016.


**Nov** Month with the most cases in 2016.

## Diseases in Detail

# 1. Rabies


**Background and Significance**

Rabies is caused by a virus that infects the brain of both humans and animals. It has one of the highest fatality rates of any known infectious disease – almost all cases are fatal once illness begins.[16] Rabies is transmitted through the bite of an infected animal. There are multiple animal reservoirs harboring different variants (strains) of rabies virus around the world that are capable of transmitting the disease. In the past 50 years, cases of human rabies in Los Angeles (LA) County have been very rare, and were reported only in persons who had been bitten by rabid animals in other countries (Table 1A). However, people have been exposed to rabies in LA County through encounters with rabid bats; in such cases, development of rabies has been prevented via the administration of rabies post-exposure prophylaxis (PEP) soon after exposure.

Rabies has been nearly absent in local pets for decades because of the legal requirement to vaccinate dogs. The last locally-acquired case of rabies in a dog occurred in 1978 from immunization of dogs with a live-type rabies vaccine, a vaccine which was discontinued in the 1980s and replaced with killed vaccines. Prior to that, the last naturally infected and locally-acquired case in a dog was in 1966. A rabid cat and a rabid dog were imported into LA County in 1987 and 2004, respectively. Both were imported from countries where rabies is more common in pets (Table 1A).

Historically, skunks were a reservoir for rabies in LA County. A skunk variant of rabies was established in skunk populations in the Malibu area. The last year in which a rabid skunk was detected in that area was in 1979. It is likely that a wildfire killed the last infected colony of skunks in 1979. A skunk infected with a bat variant of rabies was found more recently, in 2014 (Table 1A).

For over 35 years, insect-eating bats have been the only known reservoir for rabies in LA County. Cases of rabies in bats have been detected every year since bat testing began in 1961 (Figure 1A). Local data show that approximately 10-15% of bats that appear ill or are acting unusual are rabid; however, it is estimated that only about 1-3% of bats in nature are likely to be rabid.[17] Although bats are the primary reservoir for rabies in LA County, bites from other wildlife are treated as potential rabies exposures, because bats may transmit rabies to other wildlife, or rabid wild animals from other areas may be imported into LA County.

All encounters with bats must be carefully assessed by a public health professional or physician for the risk of exposure to rabies. In situations where a person or pet is directly exposed to a bat, people present at the scene should attempt to safely contain the bat without touching it directly (such as by covering it with a bucket) and then contact an animal control agency so that it may be tested for rabies. The reasons include the following:

(1) Rabies is a highly fatal disease and effective post-exposure prophylaxis (PEP) must be administered soon after exposure.
(2) Bat bites are small injuries that may go undetected. Therefore, when a bat is found near a sleeping or impaired person, small child, or pet, a bite from a bat cannot be ruled out.
(3) The results of bat testing play a pivotal role in determining whether PEP is needed. If a bat tests negative for rabies virus, PEP is not necessary. If a bat is not tested, or tests positive for the rabies virus, PEP must be given if there was any chance a bite occurred.

Elsewhere in the United States, there are multiple other important reservoirs of rabies, and multiple variants, including skunks (northern California and the Midwest), foxes (Alaska, Arizona, New Mexico, and Texas), and raccoons (East Coast). In 2007, the United States was declared free of the dog strain of rabies.[18] This was achieved through several decades of strict legal rabies vaccination requirements for all dogs. Animal control agencies continue to enforce these requirements today to maintain this status. However, it is important to understand that any strain of rabies can infect wildlife or pets (including local bat rabies strains), and dog rabies continues to be a major problem in other countries. Furthermore, local residents must be aware that animals incubating the rabies virus could be imported into LA County through global travel and trade, creating the risk of new variants becoming established in local wildlife. Because of these risks, VPH provides a strong rabies surveillance program for the county. Rabies testing is not limited to animals that have bitten a person - VPH also tests suspected animals with neurologic illnesses or abnormal behaviors. VPH continues to detect rabid animals throughout the county using these protocols. Surveillance data on rabies in LA County highlight the importance of rabies vaccination of pets. Local data on rabies also help physicians decide on whether to administer rabies PEP to people bitten by animals.

**Table 1A. Selected Historical Rabies Cases in LA County**

| **IN HUMANS** | | | |
|---|---|---|---|
| **Year** | **Age and sex** | **Probable virus source** | **Comments** |
| 2004 | 22 year old man | Bite from rabid dog in El Salvador | Likely bitten 15 months before illness |
| 1975 | 16 year old girl | Bite from rabid dog in Mexico | Likely bitten 8 months before illness |
| 1949 | 24 year old man | Bite from his own rabid dog in LA | Last locally-acquired human rabies case |
| **IN PETS** | | | |
| **Year** | **Species** | **Probable virus source** | **Comments** |
| 2004 | Dog | Bite from rabid dog in Thailand | Stray dog rescued in Thailand by an American tourist. Dog flew into LA County, died in Santa Barbara County |
| 1987 | Cat | Bite from rabid dog in Mexico | Stray cat rescued in Acapulco by an American tourist. Cat bitten by a rabid dog |
| 1978 | Dog | Live-type rabies vaccine for dogs | **Live vaccines involved no longer used**. All rabies vaccines changed to killed-type 30+ years ago |
| 1966 | Dog | Bite from local rabid skunk | Last locally acquired, naturally acquired rabies case in a dog |
| **IN WILD ANIMALS** | | | |
| **Year** | **Species** | **Probable virus source** | **Comments** |
| 2014 | Skunk (Long Beach) | Bite from local rabid bat | Example of how local bat variant of rabies can “spill over” into other species |
| 1979 | Skunk | Bite from local rabid skunk | Last case of skunk variant of rabies |
| 1973 | Raccoon | Bite from local rabid skunk or bat | Rabid skunks present locally in 1970s |

| Table 1A. Selected Historical Rabies Cases in LA County (continued) | | | |
|---|---|---|---|
| **IN WILD ANIMALS (continued)** | | | |
| 1964 | Fox | Bite from local rabid skunk or bat | Rabid skunks common locally in 1960s<br>Four rabid foxes diagnosed that year |
| 1946 | Coyote | Bite from local rabid dog | Rabid dogs common locally in the 1940s |
| 1944 | Opossum | Bite from local rabid dog | Rabid dogs common locally in the 1940s |

## Data Sources

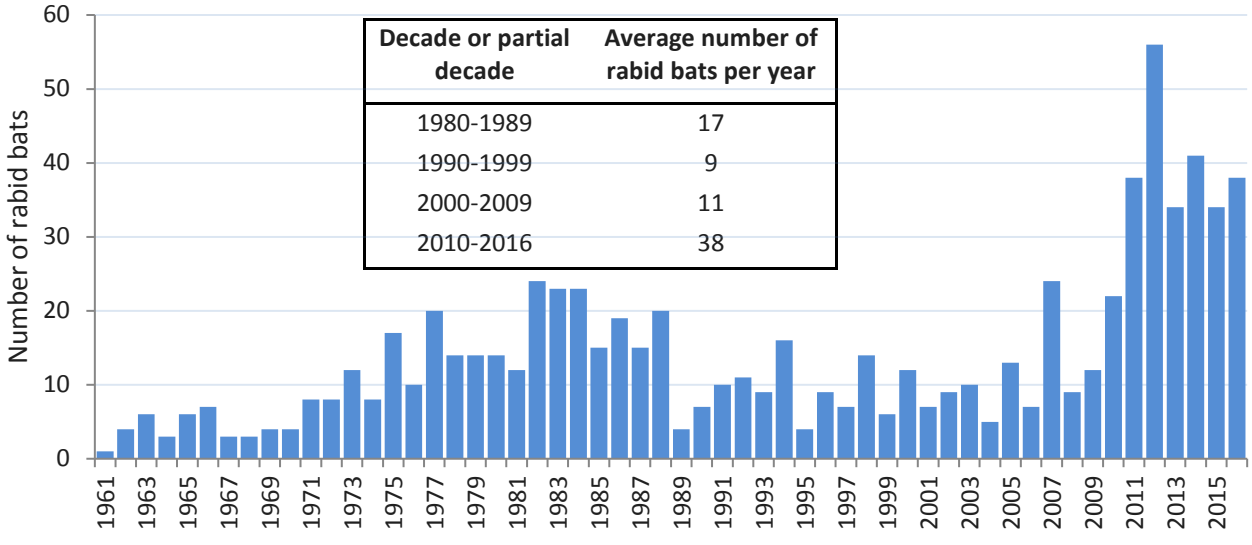
Reports of animal bites and contact with bats are received by VPH from animal control agencies, physicians, veterinarians and the public. Animal control agencies and veterinarians submit deceased animals to VPH for rabies testing. The LA County Public Health Laboratory tests brain tissues of submitted specimens using the Direct Fluorescent Antibody (DFA) test. All samples which test positive by DFA are considered confirmed cases. Rabies data from Long Beach and Pasadena are included in this report, shared by the Long Beach Department of Health and Human Services and the Pasadena Department of Public Health.

## Findings

### Totals - Rabid Bats

- 38 rabid bats were detected in 2016, an increase from the 34 rabid bats detected in 2015.
- The number of rabid bats detected per year has been above the historical average since 2011. So far in this decade, an average of 38 rabid bats have been detected per year, while the average in previous decades was only 9-17 per year. The highest annual count of rabid bats ever recorded in LA County occurred in 2012, with 56 rabid bats (Figure 1A).
- 14% of bats submitted for diagnostic testing in 2016 were positive for rabies. This was within the expected range of 10-15%.

**Figure 1A. Rabid Bats Detected in Los Angeles County, 1961-2016**

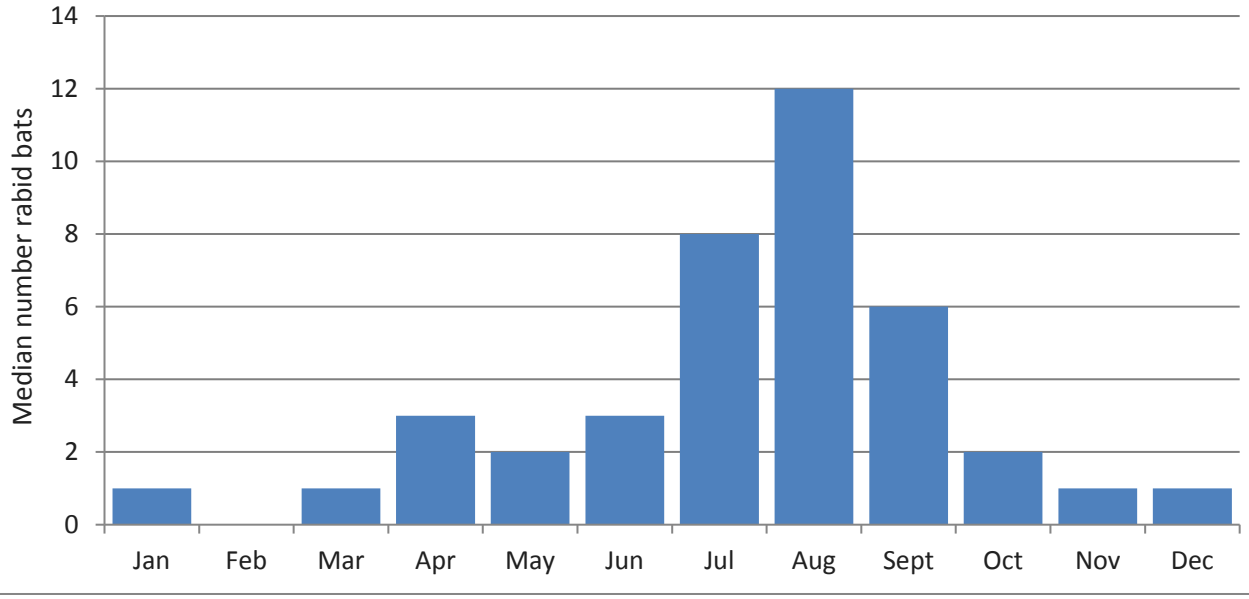



| Decade or partial decade | Average number of rabid bats per year |
|---|---|
| 1980-1989 | 17 |
| 1990-1999 | 9 |
| 2000-2009 | 11 |
| 2010-2016 | 38 |

**Seasonal pattern**

- Rabies in bats is seasonal (Figure 1B). Most rabid bats were detected in late summer and early autumn, when new young bats are learning to fly.

**Figure 1B. Five-Year Median Number of Rabid Bats Detected per month**
**Los Angeles County, 2012-2016**



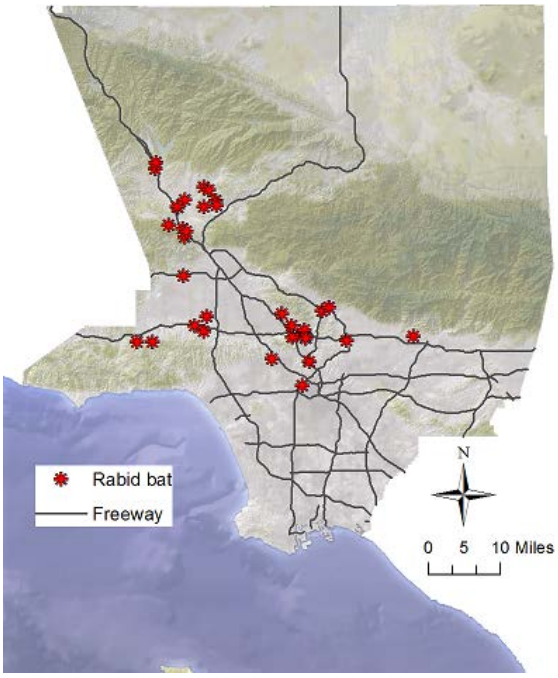

**Human and pet exposed to rabid bats**

- In 2016, 13 people and 14 pets were exposed to the 38 reported rabid bats. This was an increase compared to the 5 people and 11 pets exposed to 34 confirmed rabid bats in 2015.
    - The 13 people were advised by VPH to see a physician for rabies PEP.
    - The 14 pets were vaccinated, quarantined at home and observed for clinical signs of rabies. Quarantines after rabies exposure last 30 days for pets that were up-to-date on their rabies vaccine at the time of the exposure, and 6 months for pets that were not up-to-date on rabies vaccination.

**Geographic Pattern**

- The 38 rabid bats found in 2016 were primarily in the central and western areas of the county, in Santa Clarita Valley, San Fernando Valley, and near Downtown Los Angeles (Figure 1C).
- Eleven of the 38 rabid bats were in the city of Santa Clarita. The reason for the clustering in this city is unknown.
- In the past decade of 2007-2016, rabid bats were found across a wide area of LA County (Figure 1D).

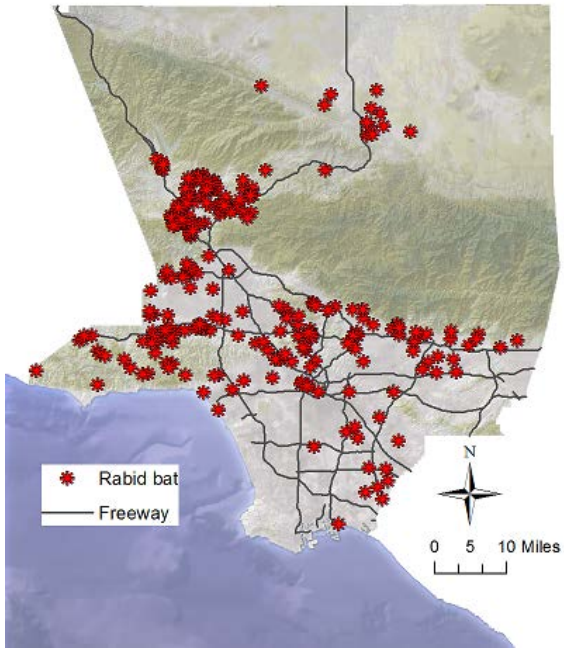
**Figure 1C. Locations of Reported Cases of Rabies in Bats (n=38 bats), Los Angeles County 2016**




**Settings where rabid bats found**

- The majority of rabid bats (23, 61%) in 2016 were found at private residences. The same number of rabid bats (23) were found at homes in 2015.
- In 2016, 10 rabid bats (27%) were detected indoors. Rabid bats found indoors present an increased risk for people and pets for rabies exposure. Six were found inside homes and two were found inside businesses. This is in contrast to 2015, where just one rabid bat was found inside a home and another inside a business.
- In 2016, three rabid bats were found at schools. One was found outdoors at a high school. A crowd of students had gathered around it, but were reported to have touched it. Another was found clinging to an outside wall at an elementary school before the children had arrived for the day. Another was found on a sports field at a middle school before children had been let out to play on the field.

**Figure 1D. Locations of Reported Cases of Rabies in Bats (n=308 bats), Los Angeles County 2007-2016**



### Limitations

Cases of rabies in animals are likely under-counted because bats and other wildlife may become infected with rabies and die without being detected by people, especially in mountainous or remote areas of the county. These data show *reported* rabid bats only. The actual number of rabid bats during these time periods was likely higher.

### Implications and Recommendations

- Local residents should be aware about the occurrence of rabies in bats in LA County, and the potential for other animals to become infected, especially wild animals.

- All dogs and cats should be vaccinated against rabies, including indoor-only animals. Ten confirmed rabid bats were found indoors during 2016, and two were found indoors in 2015.

- Schools and camps should educate all staff about bats and rabies, including custodial staff. Children are often unaware of the risk of rabies from bats.

- Residents should be informed to not feed wildlife. Wildlife routinely fed by people often become more accustomed to being near people and pets. Some species become more aggressive and territorial and are more willing to bite.

- **Bat encounters should be reported to VPH at 213-288-7060.** This includes bats that have been found near pets, small children and sleeping or incapacitated adults.
    - Because of their small teeth, marks from bat bites can disappear rapidly and bites themselves may not wake a sleeping person. Therefore, an unrecognized bite may have occurred if a bat was not observed the entire time it was near people or pets.
    - Bats found inside homes should be tested to ensure that they are not rabid. Bats should not be allowed to fly away, and should be safely contained if possible.
    - Bats should not be touched with bare hands. If possible, they should be covered with a bucket or similar object, and the local animal control agency should be contacted. A list of animal control agencies in LA County is available at: publichealth.lacounty.gov/vet/animalcontrollist.htm.

- The risk of rabies may be higher in imported animals. Rabies suspicion should be high if a sick dog, cat, or other animal comes from another country, especially where rabies is endemic or common in dogs.

**For More Information:** publichealth.lacounty.gov/vet/rabies.htm.

## 2. Heartworm


### Background and Significance

Canine heartworm disease is caused by a parasitic worm, *Dirofilaria immitis*, which is spread to animals through the bite of infected mosquitoes.[19] Mosquitoes breed in standing water, therefore removal of stagnant water is a critical step in reducing the risk of heartworm exposure. In LA County, the Western Treehole Mosquito (*Aedes sierrensis*) is considered the best local vector for this parasite, although other species can also transmit the disease.[20] Many people may be surprised that mosquito-borne diseases can be transmitted in a dry area like LA County. However, mosquitos can breed in very small amounts of water and even underground, in storm drains. Since 2014, two new potential vectors for heartworm, the Asian Tiger Mosquito (*Aedes albopictus*) and Australian Backyard Mosquito (*Aedes notoscriptus*), have been spreading in LA County.[21] The eggs of these mosquitoes are drought-resistant, increasing the challenge for preventing heartworm transmission. These new mosquitoes are potential vectors for human diseases as well, highlighting the importance of mosquito control in protecting both human and animal health.

Once heartworm is transmitted to a pet, the parasites mature in the pet's body over a 6-month period, and then migrate to the large blood vessels in the heart and lungs. An infected dog or cat may appear healthy for months or years after infection. Eventually, heartworm infection can cause a wide range of clinical signs including fatigue, exercise intolerance, and cough. If untreated, an infected pet may develop severe heart failure, lung disease and even die. Dogs are the most commonly diagnosed animals; however, the parasites can also infect cats, ferrets, wolves, coyotes and marine mammals.[19] The disease is maintained in areas where mosquitoes can feed on infected coyotes and infected, untreated dogs.[22] Infection in humans is possible, but rare.[19]

The local transmission of this disease may be facilitated by a warming climate and movements of infected pets or wildlife into the county. Epidemiologic data on local heartworm disease can help veterinarians make clinical decisions on heartworm testing and prevention. Since heartworm disease is mosquito-borne, local data can also reveal patterns in the local ecology of mosquito-borne disease in general.

### Data Sources

In LA County, cases of heartworm in dogs and cats are reportable to VPH by local veterinarians. Starting in 2014, VPH began receiving electronic laboratory reports (ELR) from two large veterinary diagnostic laboratories for every positive heartworm antigen and antibody test result. These positive laboratory reports prompt VPH to further investigate by contacting the veterinarian treating the animal, and occasionally the animal owner, in order to obtain the full report.

Laboratory tests commonly performed to diagnose heartworm in animals include: antigen testing, microscopic identification of parasite larvae (microfilariae) in the animal's blood and occasionally by

echocardiography. Heartworm testing is routinely done in veterinary clinics prior to starting heartworm preventive medications. Animals may have no overt clinical signs at the time testing is performed.

Cases in animals that had not traveled outside of southern California in the two years or more prior to diagnosis were considered southern California-acquired. Cases were categorized as confirmed, probable or suspected based on the results of diagnostic tests performed.* The data exclude cases seen by veterinary practices in the cities of Long Beach and Pasadena (see p. 4); however, veterinary practices outside of Long Beach reported seven cases that live in Long Beach, which are included in this report.

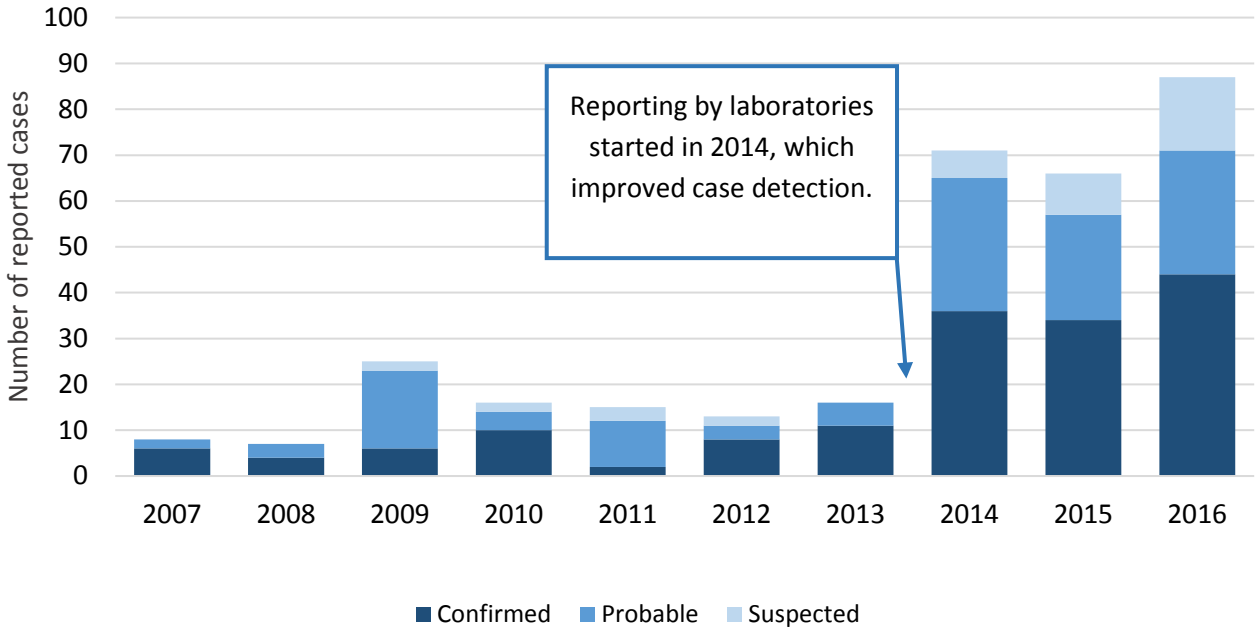
* Heartworm case definition available at: publichealth.lacounty.gov/vet/HeartwormCaseDef.htm

## Findings

**Totals - Dogs and cats with heartworm**

- In 2016, 87 cases of heartworm infection were reported in 83 dogs and 4 cats. This was an increase from the 66 cases reported in 2015.
    - In 2014, two large veterinary laboratories began to report cases electronically (ELR). The median number of cases reported during 2006 through 2013 was 14.5 per year. Between 2014 and 2016, the median number increased to 72 per year. Therefore, ELR likely improved surveillance, and it is unknown whether the true incidence of heartworm increased in 2014.
- Over the decade between 2007 and 2016, a total of 324 cases were reported in 303 dogs and 21 cats (see Figure 2A).
    - 50% were categorized as confirmed, 38% probable and 12% suspected).
    - The median age of dog cases was 5 years, with a range of 8 months to 15 years.
    - The median age of cat cases was 6 years, with a range of 1 year to 17 years.

**Figure 2A. Reported Cases of Heartworm Infection in Dogs and Cats, Los Angeles County, 2007-2016**



**Clinical Findings**

- Information on clinical signs was available for 289 of the cases reported during 2007-2016. Most (77%) had no signs. Of the 67 with signs, 70% had cough, 48% had fatigue, and 9% had heart failure. (Note: Since one pet could have multiple clinical signs, percent totals exceed 100%).

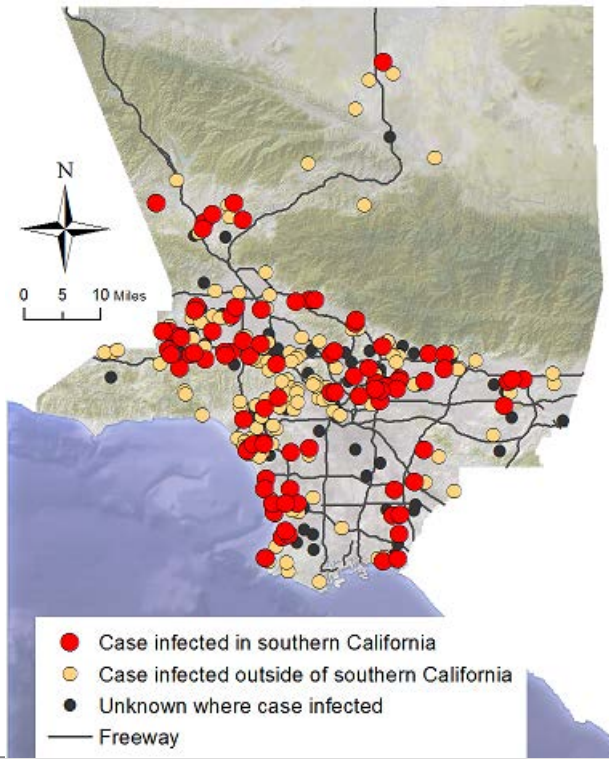
**Treatment**

- Information on treatment was reported for 292 of the cases reported during 2007-2016. Of these, 74% were receiving some treatment for heartworm diseases at the time of reporting, and 26% were untreated.

**Geographic Pattern**

- During 2007-2016, cases appeared to be more common in the western San Fernando Valley, the western and eastern edges of the San Gabriel Valley, and along the western coastline (Figure 2B).
- Several clusters were identified:
    - 2009:
        - 3 dogs on one property in South Pasadena
        - 2 dogs on one property in West Hills
    - 2011:
        - 2 dogs on one property in Castaic
    - 2014:
        - 7 dogs in same area in Pacoima. All of these dogs had been rescued, and all had become infected outside of southern California.
    - 2015:
        - 2 dogs on one property in Palos Verdes Estates
        - 2 dogs in Altadena
    - 2015-2016:
        - 2 dogs in Playa del Rey (one in December 2015 and one in January 2016)
    - 2016:
        - 2 dogs in Culver City
        - 2 dogs in Los Angeles (90211)

**Figure 2B. Locations of Reported Cases of Heartworm Infection in Dogs and Cats (n=324) Los Angeles County 2007-2016**

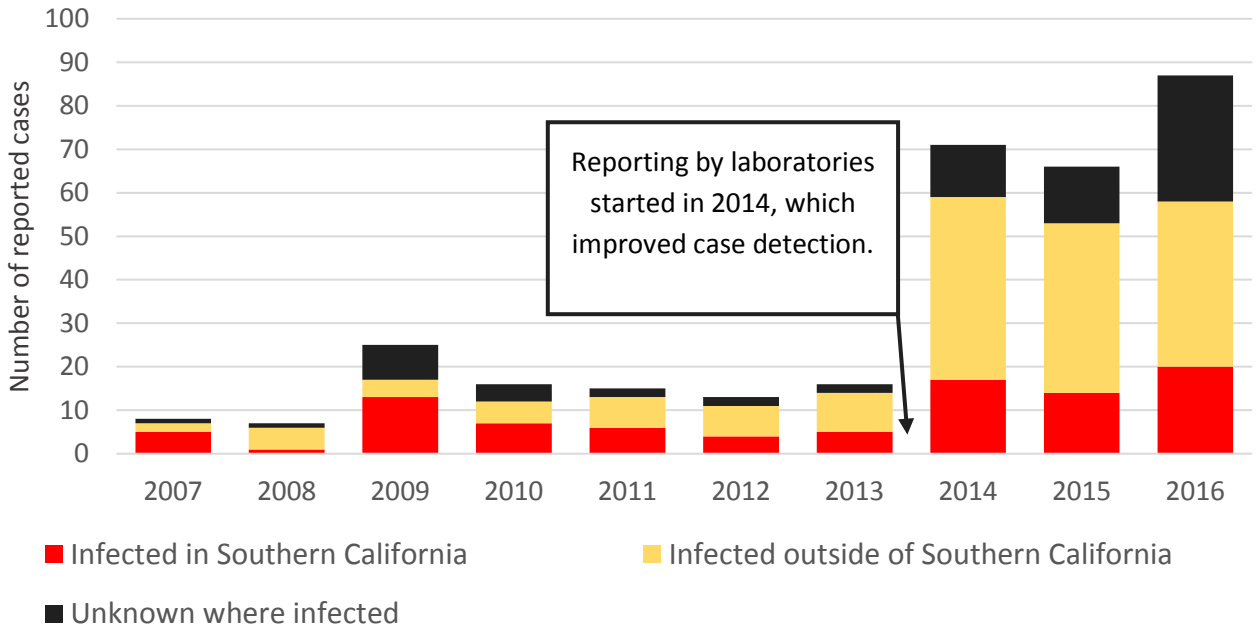



- There was a lack of cases in the South Los Angeles area. However, this may be due to lack of veterinary services and testing (Figure 2B).

**Where Infections Acquired**

- 92 of the 324 cases (28%) reported during 2007-2016 had not traveled outside of the region and likely acquired heartworm infection from mosquitoes in southern California. Nearly half (158, 49%) were likely infected while outside of southern California. For 74 cases (23%), not enough travel history was available to assess exposure (Figures 2B and 2C).
    - In 2016 38 cases that had been infected while the pet was outside of southern California:
        - 29 of these (76%) were infected in United States. The top two states were Texas (7 cases) and Florida (4 cases).
        - 9 of these (24%) were infected in other countries. The top two countries were South Korea (3 cases) and Costa Rica (2 cases).

**Figure 2C. Reported Cases of Heartworm Infection in Dogs and Cats, by Location where Infection Acquired, Los Angeles County, 2007-2016**




**Limitations**

Identification of heartworm cases by VPH is affected by various steps during the reporting process. Under-reporting can occur if: 1) owners do not bring their pets to a veterinarian, or 2) the veterinarian decides not to test the pet for the disease, or 3) the client declines the test. Identification of southern California-acquired cases vs. cases imported into the area may be affected by the ability of animal owners to recall travel done with their pet in the previous two or more years before diagnosis (recall bias).

**Implications and Recommendations**

- Although almost half of the cases were infected outside of southern California, a significant proportion (28%) were infected in southern California. This provides evidence that local mosquitoes are spreading heartworm to local pets.
- Most cases in the past decade were infected outside of southern California. These data show that animals imported into the area from states, regions or countries may bring the parasite with them.
- The majority of cases (77%) were diagnosed before developing clinical signs, most likely during routine screening tests for heartworm.
- Treating pets for heartworm helps prevent spread of the disease. Untreated pets (26% of reported cases) and coyotes may act as reservoirs for the disease.[22] When local mosquitoes bite untreated pets, they may spread it to another pet.
- Monitoring trends in heartworm cases in animals is an important part of monitoring LA County for mosquito-borne disease in general. The local incidence of heartworm may potentially increase in the future. The arrival and spread of a new vectors for heartworm, *Aedes notoscriptus* and *Aedes albopictus*, may increase the risk of transmission. Increases in ambient temperatures may shorten the life cycles of local mosquitoes, leading to larger mosquito populations.
- Prevention
    - Reduce mosquito populations. Areas of standing water around a property should be identified and removed 1-2 times weekly. This step is cost-free and helps protect people and animals from heartworm, West Nile Virus and other mosquito-borne diseases.
    - Monthly heartworm preventive medication is recommended.
        - Many of these medications also protect against a variety of other diseases and parasites of pets, some of which can cause infection in humans, such as roundworms and hookworms.
        - Prevention is advisable, as treatment of infected pets can be costly and presents some risk to their health.
- Screening tests
    - It is recommended that pets be tested annually for heartworm infecton.[23, 24]

**For More Information:** publichealth.lacounty.gov/vet/heartworm.htm.

## 3. Leptospirosis


### Background and Significance

Wildlife can carry several zoonotic pathogens of importance. One of them is the *Leptospira* bacteria, which causes leptospirosis. These bacteria thrive in water and can be found in the urine of commonly infected wildlife such as raccoons, skunks, opossums or rats.[25] Therefore, the risk of this disease being transmitted to animals and people exists even in urban and suburban environments. People and animals become infected with leptospirosis when the bacteria enter the body through mucous membranes (gums, eyes) or breaks in the skin. This occurs most often through contact with water contaminated with animal urine.

There are many different strains (serovars) of *Leptospira* bacteria that circulate among specific animal species (reservoir hosts). Disease usually occurs when an animal-specific serovar infects another species, including humans. The bacteria most commonly attack the liver and kidneys of infected hosts. Depending on the strain involved, clinical signs in animals may include: fever, vomiting and dehydration.[25] While clinical signs in people can vary, they may include: fever, headache, chills and muscle pain.[26] In dogs, vaccines are available that protect against four serovars: canicola, icterohemorrhagiae, grippotyphosa, and pomona.

Animals act as sentinels for the disease. Infected dogs indicate that the bacteria are present in the animal's environment, such as water sources (pets' food/water bowls or fountains) that have been contaminated by infected wildlife. Pets may also be a direct source of infection to people through shedding of the pathogen in infected urine.

### Data Sources

In LA County, cases of leptospirosis in dogs are reportable to VPH by local veterinarians. Starting in 2014, VPH began receiving electronic laboratory reports (ELR) from two large veterinary diagnostic laboratories for every positive antibody or polymerase chain reaction (PCR) test result for leptospirosis. These positive laboratory reports prompt VPH to contact the veterinarian treating the animal to obtain the full report. Diagnosis was typically made through serology or PCR on urine or blood. Serology measures the level of antibodies against *Leptospira* and is best performed by testing two blood samples taken at 2 to 4-week intervals. It provides insight into the serovar of *Leptospira* likely involved in the infection. A single positive PCR test confirms leptospirosis but gives no information on the infecting serovar. VPH veterinarians investigate each leptospirosis case to identify risk factors involved and provide recommendations for testing and prevention of additional infections. Cases of leptospirosis are classified as confirmed, probable or suspected based on test results and the presence of clinical signs*. The data do not include any reports from veterinary practices in the cities of Long Beach and Pasadena; however, one case each was reported on dogs that live in Pasadena and Long Beach by veterinarians in practices outside of those cities (see p. 4).

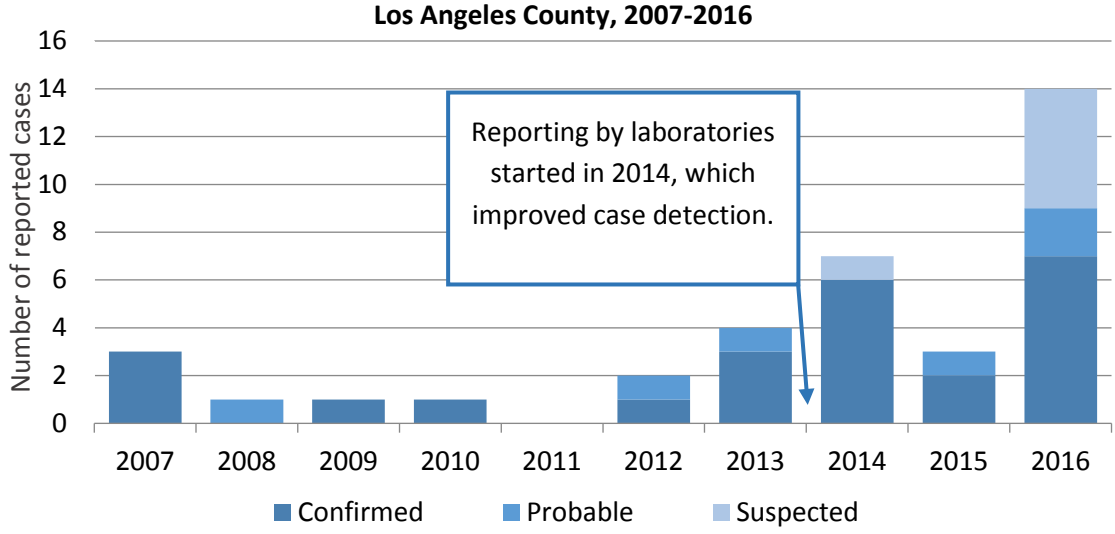
* Case definition available at: publichealth.lacounty.gov/vet/LeptospirosisCaseDef.htm

## Findings

### Totals - Dogs with leptospirosis

- In 2016, 14 cases of were reported in dogs. This was an increase from the 3 reported in 2014 and was also the highest number reported in one year since surveillance began in 2005 (Figure 3A).
- Over the decade between 2007 and 2016, 36 cases of leptospirosis in dogs were reported (Figure 3A).
    - 67% of cases in dogs were categorized as confirmed, 17% probable, and 17% suspected.
        - The median age of the dogs was 6.5 years, with a range of 2.5 months to 15 years.
        - 39% were diagnosed by serology alone, 36% by PCR alone, 17% by both methods; there were three cases (8%) that were diagnosed by ELISA (one case was diagnosed with ELISA and single serology).
        - 6 dogs died from the disease (17%)
        - Vaccination history was available for 33 cases. Of these, 82% had not been vaccinated for leptospirosis.
    - In 2014, veterinary laboratories began to report cases electronically (ELR). The median number of cases reported during 2006 through 2013 was 1.5 per year. Between 2014 and 2016, the median number increased to 7 per year. Therefore, ELR likely improved surveillance, and it is unknown whether the true incidence of leptospirosis increased in 2014.

**Figure 3A. Leptospirosis in Dogs by Year, Los Angeles County, 2007-2016**



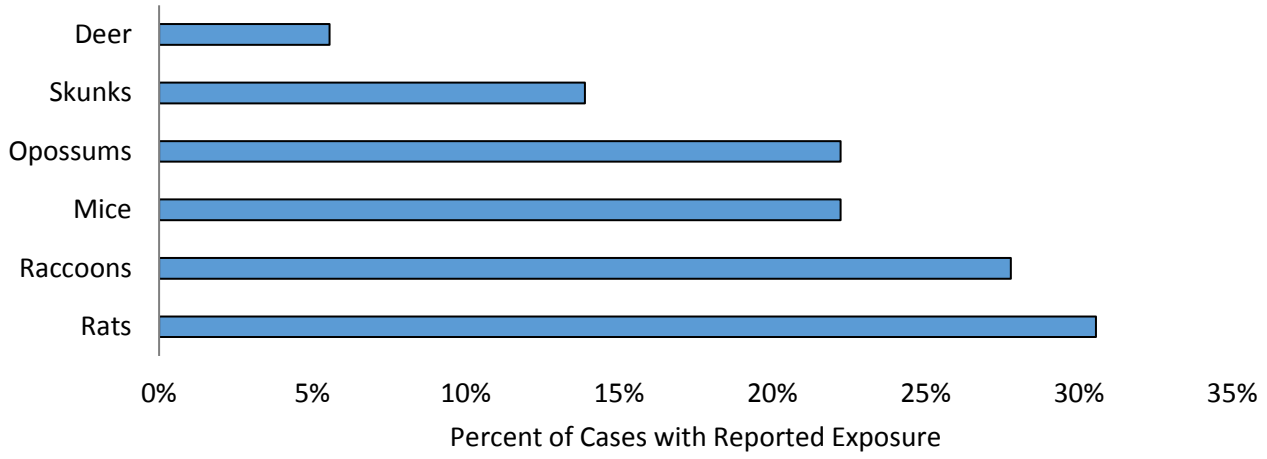

### Seasonal Pattern

- More than half of the 36 cases (23 or 64%) reported between 2007-2016 were diagnosed in in the second half of the year.

### Dog exposures to Wildlife

- 17 of the 36 cases (23 or 64%) reported between 2007-2016 were associated with exposure to backyard wildlife. These included raccoons, mice, rats, opossums and skunks (Figure 3B).

**Figure 3B. Wildlife Exposure in Reported Leptospirosis Cases in Dogs (N=36), Los Angeles County, 2007-2016**




**Clinical findings**

- Azotemia was the most common test finding (67% of cases in dogs). Azotemia typically indicates involvement of the kidneys, dehydration, or both (see Table 3A).
- Evidence of liver involvement (elevated liver blood values) were reported in 47% of cases.
- Fever was reported in only 19% of cases.
- Vomiting was the most common sign, reported in 46% of cases.

**Table 3A. Common clinical findings in reported leptospirosis cases in dogs* (n=36), Los Angeles County, 2007-2016**

| | Percent of cases |
|---|---|
| Increased kidney values on blood test (azotemia) | 67% |
| Increased liver values on blood test | 47% |
| Vomiting | 47% |
| Urinating larger amounts (polyuria) | 28% |
| Diarrhea | 22% |
| Drinking more water (polydipsia) | 19% |
| Fever | 19% |
| Yellowing of whites of eyes (icterus) | 16% |

**Infecting serovars of *Leptospira* in dogs**

- In 8 cases, two serologic tests (paired serology) were performed on the dog. Performing these two tests helps identify the serovar (strain) of the bacteria involved. A four-fold increase or decrease in the antibody titer against a specific serovar in the serologic tests reveals which serovar(s) are more likely to be infecting the dog. In two cases, more than one serovar was implicated in infecting the animal (Table 3B). Knowing the infecting serovar help reveal the likely source of the infection. *Autumnalis* was the most common serovar associated with cases (6 out of the 8). Mice are primary reservoir for the

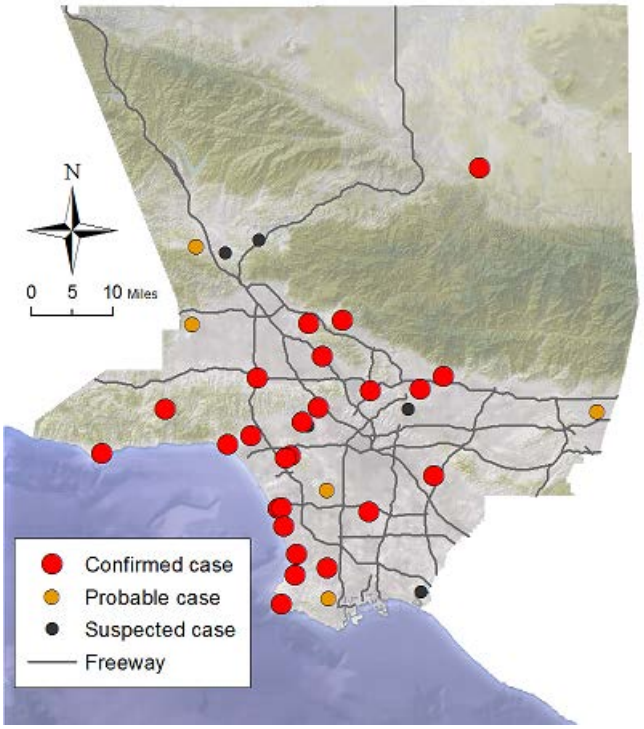
*Autumnalis* reservoir, although other animals, such as rats, raccoons, and opossums, can spread it as well.

| Table 3B. Infecting serovars in cases of confirmed leptospirosis in dogs diagnosed by paired serology (n=8), Los Angeles County, 2007-2016 | | |
|---|---|---|
| **Infecting Serovar(s)** | **Number of cases** | **Primary reservoir hosts – common LA County urban wildlife** |
| *Autumnalis* | 4 | Mice |
| *Autumnalis & Pomona* | 1 | Mice, opossums, skunks |
| *Autumnalis & Grippotyphosa* | 1 | Mice, raccoons, skunks, opossum |
| *Pomona* | 1 | Skunks, opossums |
| *Canicola* | 1 | Dogs |

**Geographic Pattern**

- Dogs with leptospirosis in 2007-2016 lived throughout LA County. This was expected, since dogs are likely exposed to the disease from wildlife species that are common throughout the county.
- Due to the cost of testing, leptospirosis may be more likely to be diagnosed in dogs in higher income areas.

**Figure 3C. Locations of Reported Cases of Leptospirosis in Dogs (n=36), Los Angeles County 2007-2016**



## Limitations

Identification of leptospirosis cases by VPH is affected by various steps during the reporting process. Under-reporting can occur if: 1) the animal is not brought to a veterinarian, 2) the veterinarian decides not to test the animal for the disease, or 3) the pet owner declines to accept or pay for the test.

Some cases of leptospirosis could not be confirmed because only one serologic test was performed or reported. In other cases, a lack of an accurate vaccine history may lead to test misinterpretation as infection instead of as a vaccine-induced positive serologic test. Note that due to cross-reactivity among *Leptospira* serovars in serologic testing, the serovar responsible for infection cannot be completely confirmed.

## Implications and Recommendations

- Leptospirosis is present in LA County. Although the total number of cases remains low, local pets may be at risk of infection.
- Although leptospirosis often affects multiple organs and may cause systemic disease, infected animals often do not develop a fever.
- Local wildlife are the primary suspected sources of leptospirosis in dogs of LA County. Wildlife likely contaminate backyard sources of water (e.g., water bowls, fountains) consumed by dogs.
- Epidemiologic data on leptospirosis in dogs is highly valuable to veterinarians and physicians. It directly affects decisions regarding clinical testing, treatment, and prevention of the disease in animals and people.
- Consider vaccinating dogs against leptospirosis.
    - Especially important in dogs that share an environment with wildlife such as raccoons or rodents.
    - Four-way leptospirosis vaccines are protective against more serovars than the two-way vaccine. The Pomona serovar is likely present in LA County, and is not covered by the two-way vaccine.
- Dogs should be tested for leptospirosis if they have compatible clinical signs.
    - Performing either PCR or paired serologic testing and obtaining a thorough leptospirosis vaccination history is crucial to confirming the disease in dogs.
- Do not attract wildlife into the yard.
    - Keep pets' food and water bowls inside the house, especially at night.
    - Clean pets' bowls daily using soap and hot water.
    - Do not feed wildlife; pick up fallen fruits and other potential food sources in a yard.
- Prevent leptospirosis infection in people. Reduce contact with potentially infected urine by:
    - Washing hands frequently.
    - Cleaning potentially infected areas using gloves.
    - Contacting an exterminator if rat infestations are present.

**For More Information:** publichealth.lacounty.gov/vet/Leptospirosis.htm

## 4. Parvovirus in Dogs


### Background and Significance

Canine parvovirus is a vaccine-preventable viral disease affecting dogs. The virus attacks the intestinal mucosa and immune system, causing vomiting and diarrhea. The diarrhea is often severe and bloody, and contributes to rapid dehydration, as well as loss of protein and electrolytes. Cases of parvovirus in dogs are often fatal without hospitalization and intensive support.[27] Parvovirus in dogs is commonly diagnosed with a rapid enzyme-linked immunosorbent assay (ELISA) test on feces that can be easily performed in most veterinary clinics.[27]

Parvovirus is highly contagious, and is transmitted between dogs by direct or indirect contact with their feces. The virus can survive for prolonged periods in the environment.[27] Vaccination against parvovirus can prevent infection, and has been a part of the standard vaccination recommendations for dogs for over 30 years. To be fully protected, puppies must receive a series of 3 vaccines at ages 2, 3, and 4 months, followed by a booster one year later. Adult dogs are typically revaccinated every 1-3 years.[28]

Canine parvovirus is not zoonotic and, therefore, does not pose a health risk to humans. However, cases of parvovirus in dogs serve as a marker for areas in LA County where access to, or utilization of, basic veterinary preventive health care is low. A lack of basic veterinary care can increase the risk of human exposure to zoonotic diseases.

### Data Sources

Surveillance for parvovirus in dogs began in 2007, when it was first listed as a priority reportable disease by VPH. Because of the large volume of cases, minimal data is collected in each case. Canine parvovirus is reported using an abbreviated spreadsheet-style reporting form. Data collected include only the dog's breed, age, impound date (if applicable), date diagnosed, clinical signs, diagnostic test results, and the dog's zip code of origin. Vaccine status of the dogs was not available for the majority of cases, since most cases were reported by shelters. Medical history is usually not available for stray dogs and dogs relinquished to shelters. Information on the categorization of cases (i.e. the case definition), is available on the VPH website.* Reports were received from Long Beach in years 2010-2016 and from Pasadena in years 2010-2011 and in 2015-2016.

Confirmed canine parvovirus cases were those that had compatible clinical signs and a positive ELISA or PCR test on feces. Because of the minimal amount of data available on cases, no cases were categorized as probable. Suspected cases were those that had compatible clinical signs and/or epidemiologic links to

confirmed cases, and had either no diagnostic testing performed or a negative ELISA test. Confirmed and suspected cases were analyzed together, except where indicated.

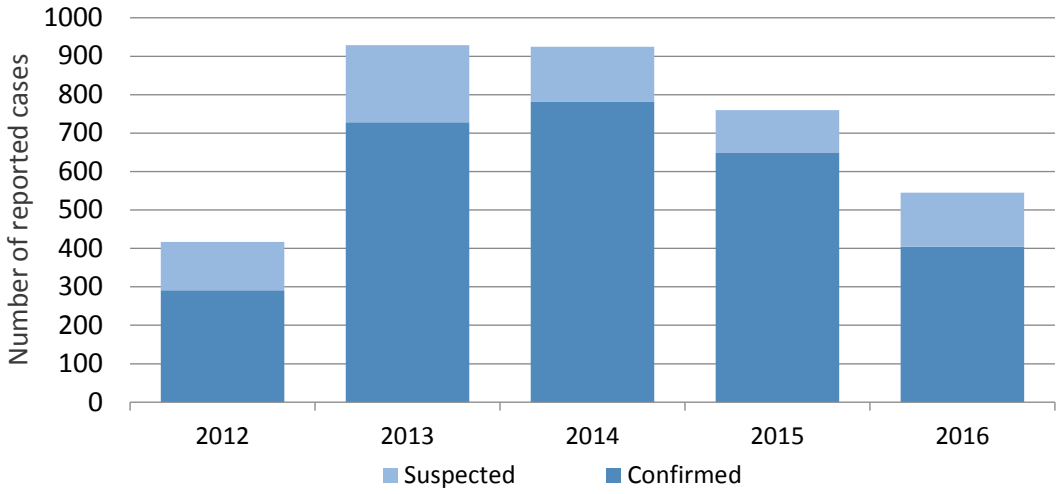
* Case definition available at: publichealth.lacounty.gov/vet/ParvoCaseDef.htm

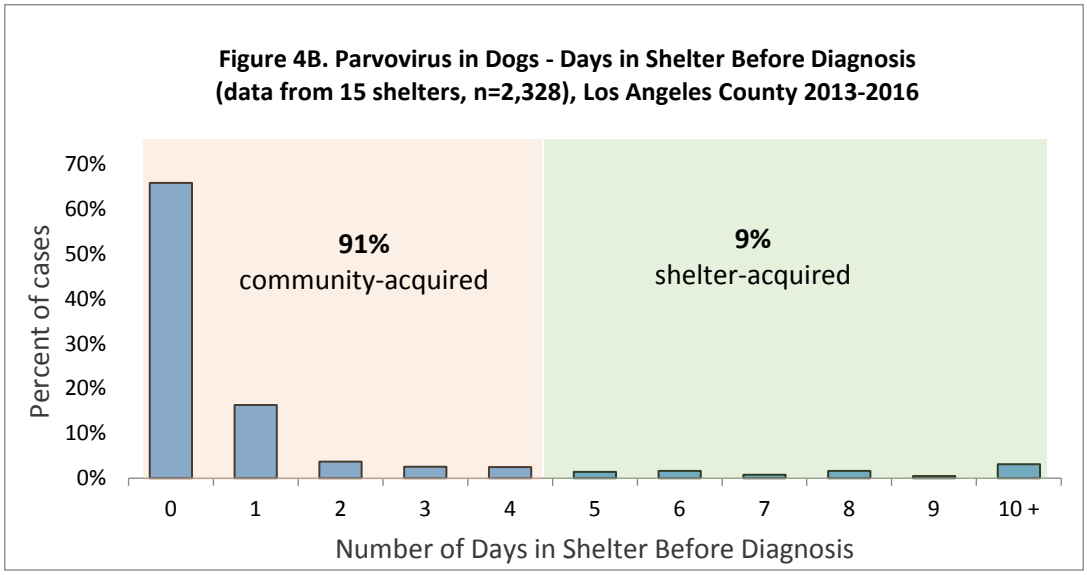
## Findings

### Totals - Dogs with parvovirus

- In 2015, 545 cases of canine parvovirus were reported in dogs. This was a significant decrease from the 760 cases reported in 2014 (Figure 4A).
- In the five years between 2012 and 2016, a total of 3,576 canine parvovirus cases were reported.
    - 80% were categorized as confirmed, and 20% were suspected.
    - The number of cases reported was highest in 2013 (Figure 4A).
    - The median age of the cases was consistently 4 months across all five data years, while the average age rose from 6 months to 7 months.
    - Source of Reports. Animal shelters contributed the most to surveillance, reporting 78% of cases, while private veterinary practices reported 22% cases. A small number (0.2%) were reported by other sources such as pet owners.
    - Sources of Infection. The vast majority of cases obtained their infection from other infected dogs in the community. Even when analyzing just cases that were reported from shelters, the vast majority had become infected in the community, before entering the shelter.
        - Shelter-reported cases between 2013 and 2016 were analyzed for length of stay in the shelter before diagnosis. Dates of entry and diagnosis were available for 2,328 shelter-reported cases. Of these:
            - 66% had clinical signs on the day of entry
            - 91% were diagnosed within 4 days of entry, and were therefore likely infected before entry into the shelter (i.e. community acquired) (Figure 4B)

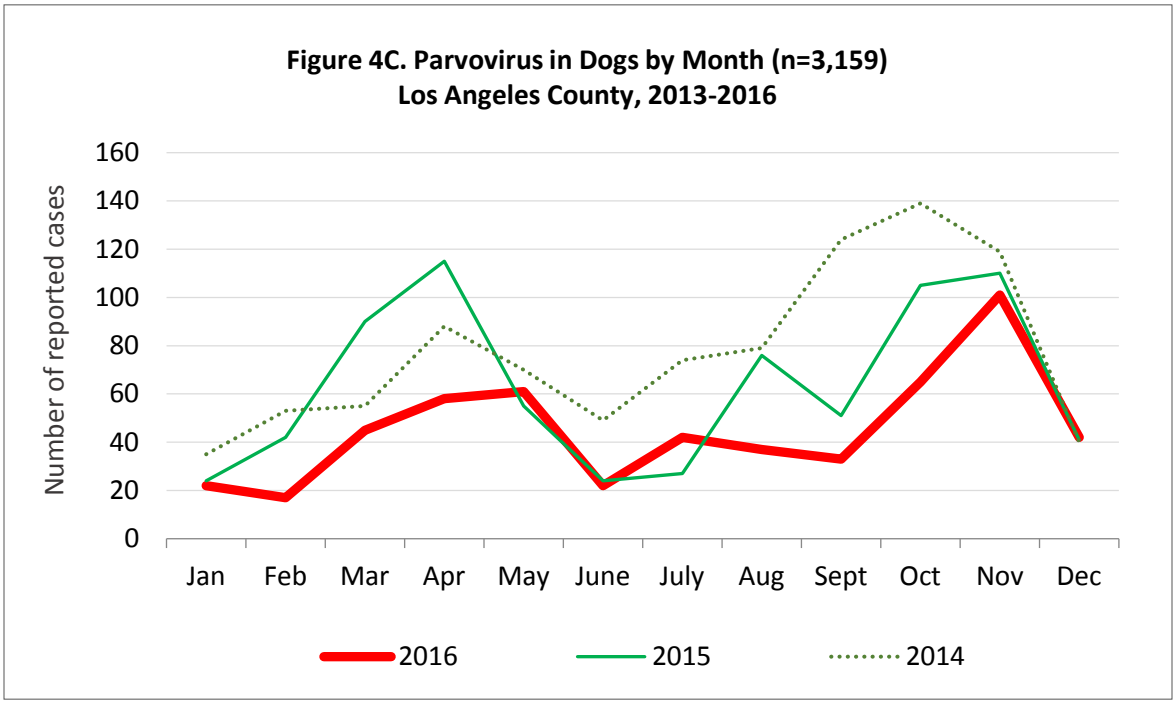
**Figure 4A. Parvovirus in Dogs by Year and Case Type (n=3,576)**
**Los Angeles County 2012-2016**






**Seasonal Pattern**

- Parvovirus infection in dogs followed a bimodal seasonal pattern, with increases in late spring and autumn (Figure 4C). Cases consistently decreased in December and January in each of the last three years.



**Geographic Pattern**

- Although cases of parvovirus occurred all over the county, cases clustered between 2012-2016 in the central part of the Los Angeles Basin, the northeastern part of the San Fernando Valley, the central and eastern parts of the San Gabriel Valley, and in the Antelope Valley (Figure 4D).
- The number of reported cases was higher in zip codes with fewer veterinary practices (Figure 4E).

**Figure 4D. Canine Parvovirus. Number of cases per zip code, Los Angeles County, 2012-2016**

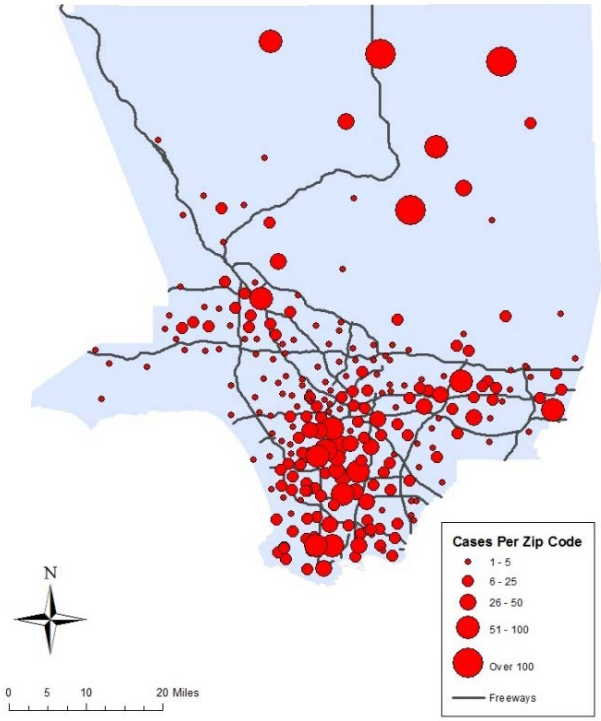
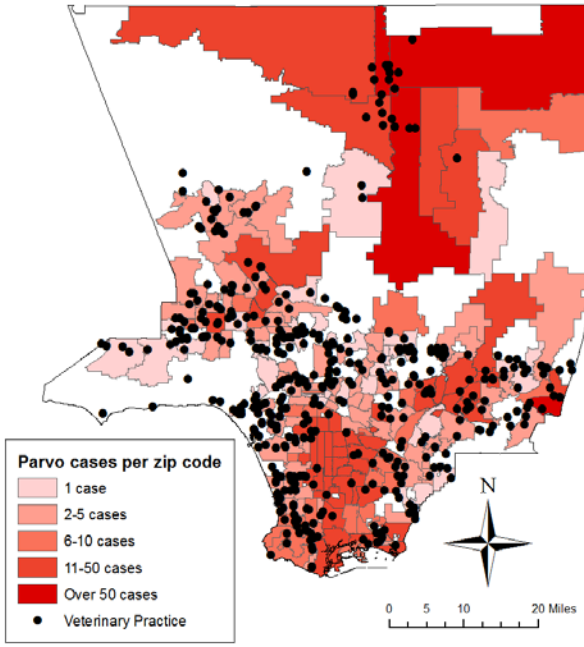


**Figure 4E. Number of canine parvovirus per zip code vs locations of veterinary practices, Los Angeles County 2014-2016**




**Limitations**

Many parvovirus cases in dogs are likely unreported because veterinarians may not report all cases, and dog owners may lack of financial resources for, or access to, diagnostic testing for their dog.

### Implications and Recommendations

- Canine parvovirus data highlights areas in LA County where more veterinary preventive services are needed. Dogs that have not been vaccinated against parvovirus may be less likely to receive other vaccines, including rabies, as well as preventive care such as deworming and flea control. Therefore, people in areas with more canine parvovirus may also face a higher risk for rabies or other zoonotic diseases exposure if their pets become infected.
- Data on canine parvovirus in LA County highlights areas most in need of veterinary care, animal vaccination, and educational outreach.
- Cases of parvovirus in dogs in LA County should be reported to VPH using the simplified Parvovirus Tracking Sheet.*
- Non-profit, governmental, and community organizations working in animal health are strongly encouraged to use canine parvovirus data to guide the location and timing of their community outreach efforts to improve animal vaccination.
    - Education on vaccination of pets for the public is a critical part of outreach. Dog owners should be educated about the disease and the importance of vaccination schedules (including boosters). They should also be educated on zoonotic and vector-borne disease prevention.

**For More Information:** publichealth.lacounty.gov/vet/parvo.htm.

* For veterinary practices: publichealth.lacounty.gov/vet/docs/Forms/ParvoTrackingSheet_vet.pdf
For animal shelters: publichealth.lacounty.gov/vet/docs/Forms/ParvoTrackingSheet_shelter.pdf

## 5. Valley Fever (Coccidioidomycosis)


### Background and Significance

Valley fever (coccidioidomycosis) is caused by a fungus (*Coccidioides immitis*) that is common in dry climates of the southwestern United States, parts of Mexico, and Central and South America.[29] The fungus is found in the soil and spores can spread through the air, especially when the ground is disturbed such as during earthquakes, construction or excavations.[30] Disease occurs when fungal spores are inhaled by a person or animal.[29] Thus, exposure comes from the environment and, with extremely rare exceptions, *Coccidioides immitis* does not spread directly between people or between animals. Many people and pets that are exposed to the fungus do not get sick from Valley fever.[31] Symptoms of Valley fever in humans and animals are generally similar and include: fever, fatigue, cough and sometimes skin lesions.[31] Dogs may also suffer from weight loss and bone infections that appear similar to some types of bone cancers.[32]

Some pets, because of specific behaviors (living outdoors, digging into the ground), may be more likely to be exposed to Valley fever compared to people. Therefore, animals with Valley fever may act as sentinels for human disease in areas of LA County where the fungus is present.

### Data Sources

In Los Angeles (LA) County, cases of Valley fever in animals are reportable to VPH by local veterinarians. Starting in 2014, VPH began receiving electronic laboratory reports (ELR) from two large veterinary diagnostic laboratories for every positive antibody test result for Valley fever. Each report was investigated by a VPH veterinarian in order to obtain a full case report. As a result, the number of reports and completeness of data received increased significantly starting in 2014. Occasionally, cases of Valley fever were not reported until a year or more after they were first diagnosed – this occurs when a laboratory reports a positive test, but the diagnosing veterinarian reports that the condition was initially diagnosed earlier, usually by biopsy or by being tested in another jurisdiction. Cases that were diagnosed outside of LA County were counted as cases in LA County only if they had illness from the disease while in LA County. Healthy dogs that were simply being tested for the disease were not counted as cases.

Diagnosis was accomplished by detection of antibodies against the disease (serology) and/or biopsy of lesions or affected tissues, plus recognition of specific clinical signs. Location of probable exposure was assessed by obtaining a travel history. Exposure location was recorded as LA County, southern California other than LA County (Imperial, Kern, Orange, Riverside, Santa Barbara, San Bernardino, San Diego, San Luis Obispo and Ventura Counties) or outside of southern California. If available, travel destinations for those cases outside of LA County were recorded. In addition, each report was categorized as confirmed, probable or suspected based on the case definition for Valley fever in animals in LA County.* The data collected do

not include any reports from veterinary practices in the cities of Long Beach or Pasadena (see p. 4).

*Case Definition available at: publichealth.lacounty.gov/vet/CoccidioidomycosisCaseDef.htm

## Findings

### Totals - Dogs and cats with Valley fever

- In 2016, 22 cases of coccidioidomycosis in 21 dogs and one cat were reported. This was an increase compared to the 16 cases reported in dogs in 2014.
  - In 2014, veterinary laboratories began to report cases electronically (ELR). The median number of cases reported during 2006 through 2013 was 3.5 per year. Between 2014 and 2016, the median number increased to 16 per year. Therefore, ELR likely improved surveillance, and it is unknown whether the true incidence of coccidioidomycosis increased in 2014.
- In the decade between 2007 and 2016, 74 cases of Valley fever in animals in LA County were reported in 90 dogs, 2 cats, and 1 Northern Elephant Seal.
    - 59% of cases were considered confirmed, 33% probable, and 8% suspected.

**Figure 5A. Valley Fever (Coccidioidomycosis) in Animals, Los Angeles County, 2007-2016 (N=93 animals)**

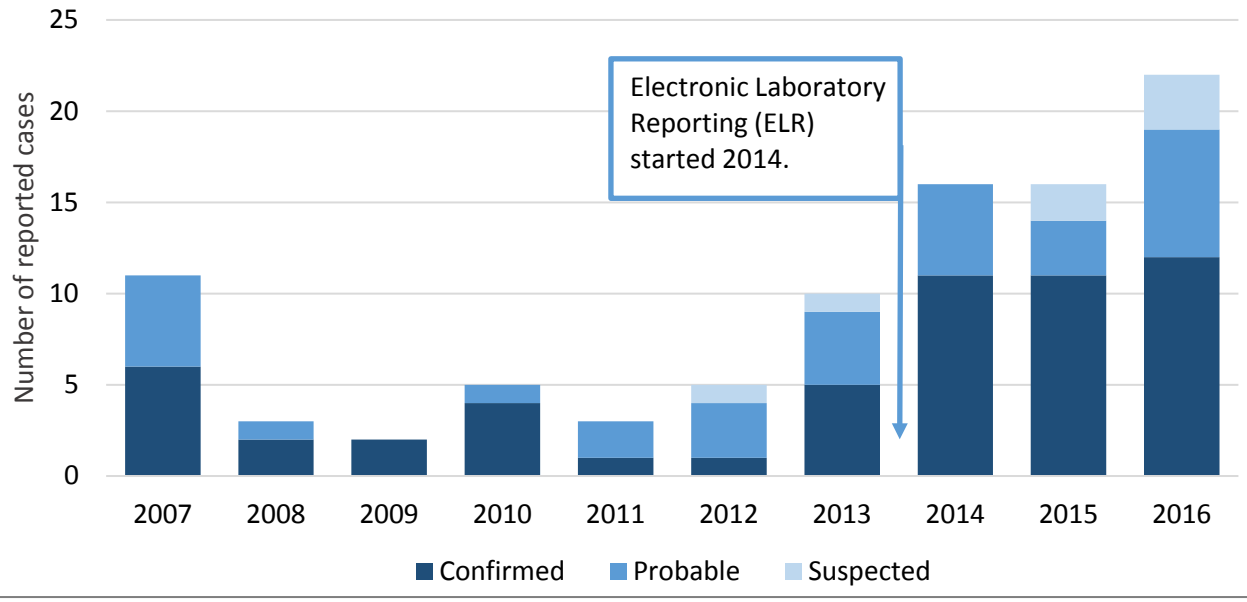
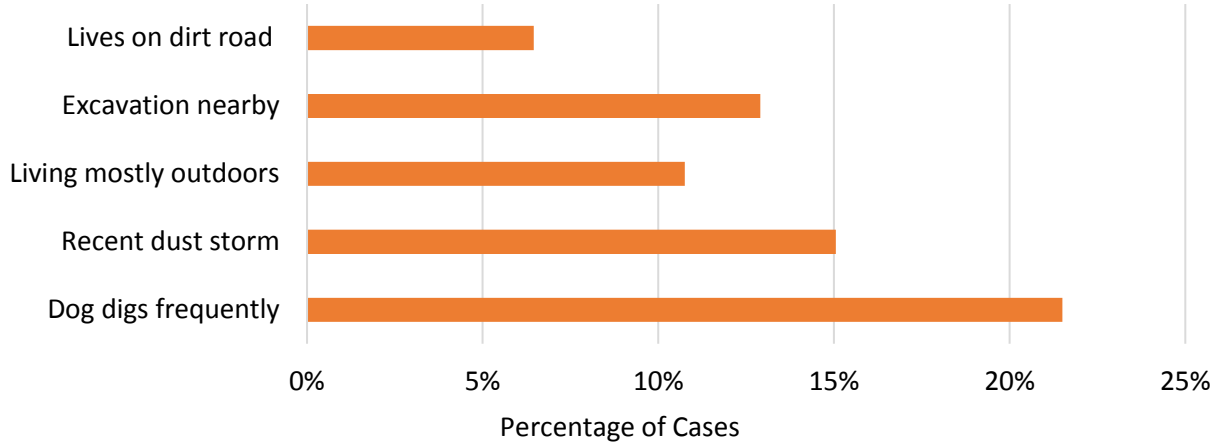


**Figure 5B. Reported Exposure Risk Factors for Valley Fever (Coccidioidomycosis) in Animals (N=93), Los Angeles County, 2007-2016**




**Exposures and risk factors**

- Between 2007-2016:
  - 26 cases (28% of reports) did not report travel outside of southern California.
  - 47 cases (51% of reports) had traveled outside southern California
    - The top three most common places of exposure outside of southern California were Arizona, Central California, and the Mojave Desert.
  - 20 animals (22% of total reports) were reported to dig in the soil frequently. Other exposure factors reported included: being in a dust storm (15%), living mostly outdoors (10%), and proximity to construction sites or other locations involving excavation (12%) (Figure 5B).

## Clinical Findings

- Dog cases 2007-2016
  - 64% had cough
  - 54% had fever
  - 43% had pneumonia or lung lesions detected on radiographs
  - 39% had weight loss
  - 37% had lameness
  - 21% had bone lesion(s) detected on radiographs
  - 24% had enlarged lymph nodes
  - 6% had eye lesion(s)
- Cat cases 2007-2016 (2 cats)
  - 1 had an eye lesion
  - 1 had a non-healing fungal abscess
- Northern Elephant Seal cases 2007-2016 (1 case)
  - Weight loss and failure to grow. Fungal lesions found throughout body after its death.

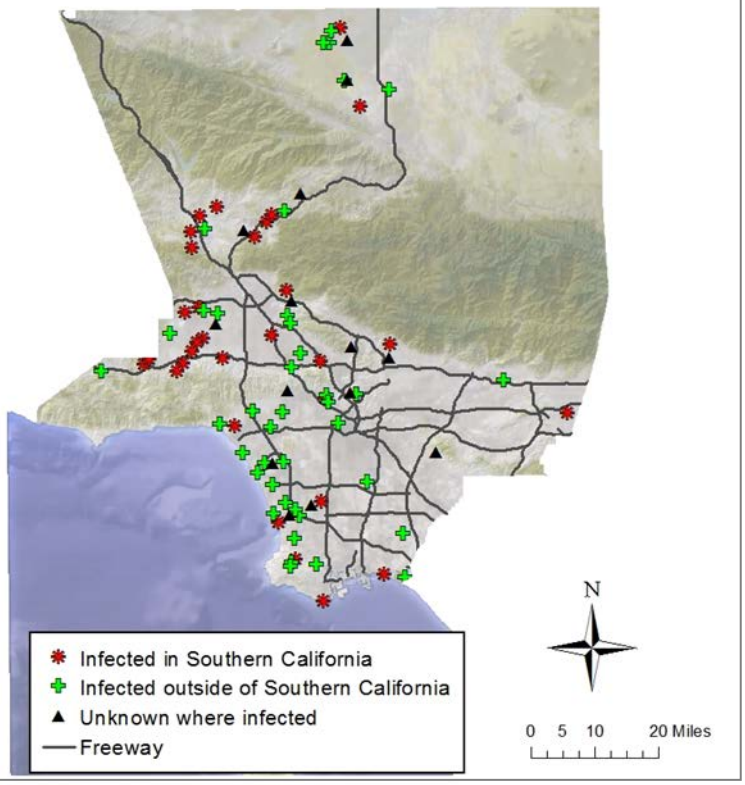
**Geographic pattern**

- During 2007-2016, most southern California-acquired cases were reported from the San Fernando Valley. Many imported cases were found on the western coastal area of LA County (Figure 5C).

## Limitations

Classification of cases on the basis of exposure location may be affected by the ability of animal owners to remember travel with their pet prior to diagnosis (recall bias). Because antibody levels in affected animals can remain positive for a long time, it may be difficult to differentiate current infection compared to previous exposure.

**Figure 5C. Locations of Reported Cases of Valley Fever in Animals (N=92), Los Angeles County 2007-2016**




*One case was missing address and zip code

## Implications and Recommendations

- In LA County, Valley fever is known to be endemic in the Antelope Valley, Santa Clarita Valley and western San Fernando Valley. Many of the locally-acquired animal cases were reported from the San Fernando Valley. However, other areas of the county also have a low number of cases reported.
- Pets with Valley fever may act as sentinels for risk of exposure for the humans that live in the same area. Monitoring disease in animals may help identify cases in humans.
- Animal owners and their pets should limit outdoor activities during dust storms and nearby excavations. Dust control, such as by wetting down work areas with water, should always be performed during projects that involve excavation; this will reduce the likelihood of inhaling fungal spores. Pet owners should discourage their pets from digging in soil.
- Veterinarians suspecting Valley fever in their patients should obtain a thorough travel history, to help assess the local burden of the disease.
- Veterinarians should rule out Valley fever in local pets with proliferative bone diseases, especially in animals coming from endemic areas.

**For More Information:** publichealth.lacounty.gov/vet/coccidioidomycosis.htm.

## 6. West Nile Virus (WNV)


**Background and Significance**

West Nile virus (WNV) is transmitted to people by the bite from an infected mosquito. The majority of humans that are infected (80%) do not show signs of disease, while about 20% may experience flu-like symptoms. Less than 1% of infected people suffer from a serious neurological form of the disease.[33] Presently, there is no vaccine available for humans.

The disease is maintained in the environment by small song birds which occasionally show signs of illness from WNV. Many types of larger birds, such as crows, ravens, jays and birds of prey, become very ill and die from it. Chickens can become infected by WNV, but do not become sick from it. Mosquitoes become infected when they bite an infected bird.[33] Although the virus has been found in a number of mosquito species, those from the Culex genus are the most important vector for WNV in the United States.[34] Mosquitoes breed in standing water, therefore elimination of standing water is a critical step in reducing the spread of WNV.

Several other animal species are susceptible to WNV, including squirrels, horses and some reptiles.[35] Horses with the disease usually suffer from severe neurological signs. However, horses are the only species that can reliably be protected from WNV by vaccination. Dogs and cats rarely get sick from WNV.[35] Horses and people are considered “dead end hosts” because, once infected, they are not expected to pass the virus to other mosquitoes after they get bitten.[36]

Originally from Africa and Europe, WNV was not found in the Americas until 1999, when it first caused neurologic disease in birds, horses and people in the New York City area.[37] Within just 3 years, the disease spread across the United States and became established in California by the end of 2003.[38] Since then, integrated surveillance programs have been put in place to count cases of WNV in humans, horses, wild birds, and mosquitoes. In some areas, chickens are periodically tested to see if they were exposed to WNV, by checking if their immune system is making antibodies against WNV.

Testing for the disease in deceased wild birds identifies outbreaks early and is one of the most cost-effective ways to track the virus in the community.[39] In a given community, bird WNV cases tend to be detected approximately one month before human cases appear, and therefore serve as an early-warning system. The location where a WNV-positive bird was found may not be the same location where it originally acquired the infection, since birds can fly large distances. However, a bird infected with WNV increases the risk of WNV in the area where it dies, since its will serve as a source of the virus for local mosquitoes while it is still alive

and weakened by the virus. Therefore, mapping dead birds infected with WNV highlights areas of heightened WNV risk for humans. In LA County, cases of WNV occur every year in both humans and animals.

## Data Sources

In 2002, the California Department of Public Health (CDPH) expanded mosquito-borne disease surveillance to include West Nile Virus (WNV) testing of mosquitos, chickens and live and dead wild birds, in collaboration with local health departments and vector control districts. The Veterinary Public Health Program (VPH) first began participating in dead bird testing that year, with the assistance of local animal control agencies, wildlife centers and the public. Fresh bird carcasses were collected for testing, and the results were mapped and shared with the community. This surveillance program was temporarily suspended in August 2013, when federal funding for much of the work was no longer available. In August 2015, VPH again began collecting and testing dead birds.

During 2013 and earlier years, multiple bird species and tree squirrels were accepted for testing. Since 2014, most testing has been limited to crows, ravens, and jays (corvids) and birds of prey, with occasional testing of other species. The majority (95%) of bird carcasses in 2014 through 2016 were tested by polymerase chain reaction performed by the Center for Vectorborne Diseases at the University of California, Davis. Before 2013, an in-house rapid-antigen test strip (VecTest™, Medical Analysis Systems, Camarillo, CA) was periodically used on corvids. Using this procedure, animals testing positive were considered confirmed, and only confirmed cases were counted. The data reported here reflect the cumulative data for LA County, including tests arranged by both VPH and local vector-control agencies across all of LA County, therefore it includes data from Long Beach, Pasadena and Vernon.

Data on human WNV cases were obtained from the Acute Communicable Disease Control Program of the LA County Department of Public Health, and does not include data from Pasadena, Long Beach, and Vernon.

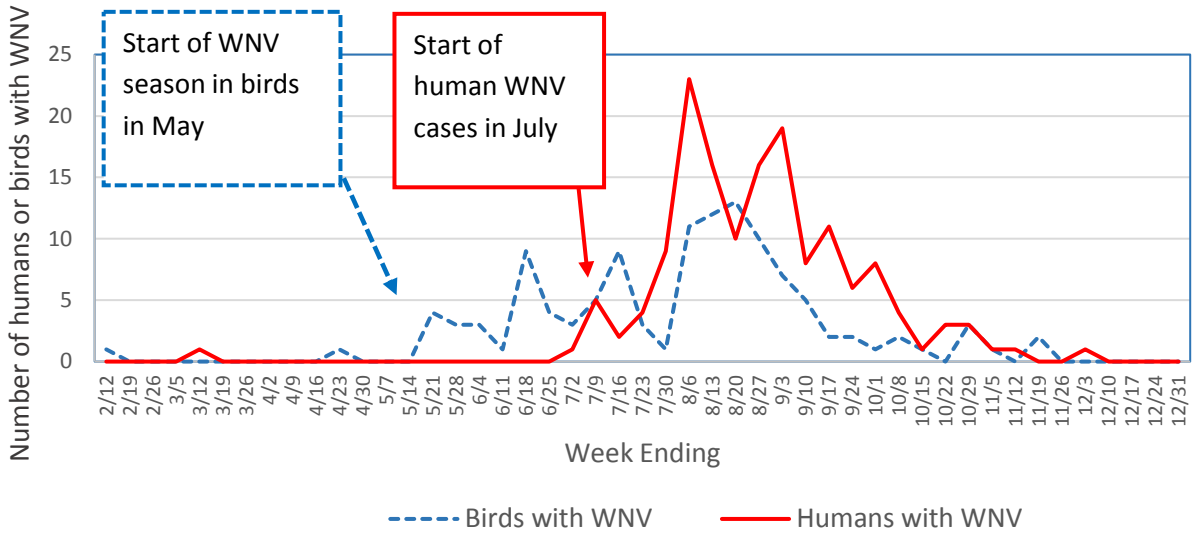
## Findings

### Totals – Birds and Humans with WNV

- In 2016, WNV was detected in 124 dead wild birds in LA County. A total of 66% of dead birds tested were WNV positive. This was an increase from the 103 infected birds (62% of those tested) detected across LA County in 2015.
- There were 153 people infected with the virus in the jurisdiction of the LA County Department of Public Health (i.e. excludes Pasadena, Long Beach, and Vernon) during 2016, a decrease from the 300 people infected in 2015.
- Bird cases began to increase in late May, signaling the start of the WNV season. Human cases began appearing about six weeks later, in early July. [40] (Figure 6A).

**Figure 6A. Humans and Dead Birds Infected with WNV, by week**
**Los Angeles County, 2016**

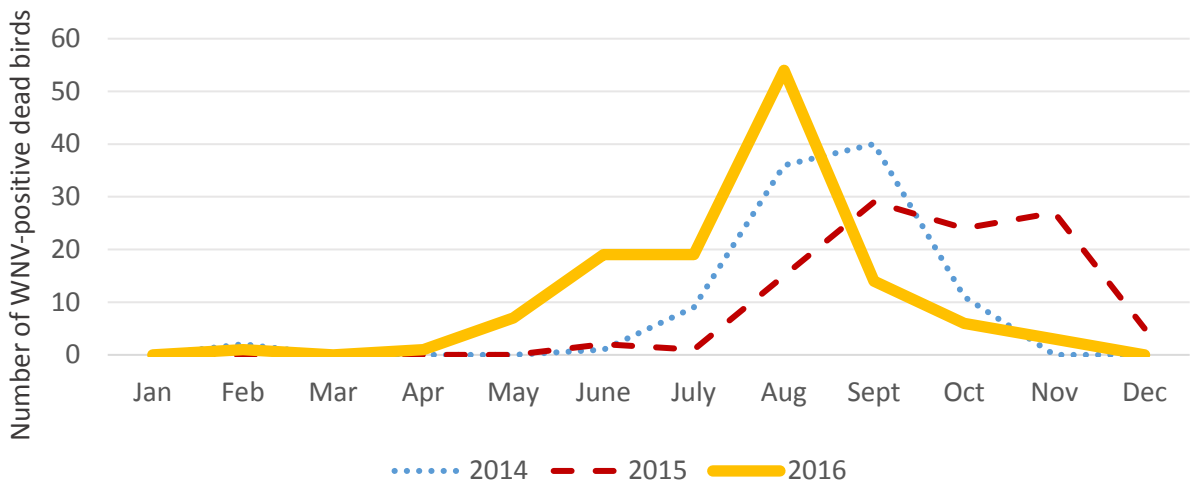
*Excludes bird and human data from the cities Pasadena, Long Beach and Vernon.*




**Seasonal Pattern**

- The peak of the WNV shifts from year to year. In 2016, WNV positive birds peaked in August, earlier than it had in the two preceding years. (Figure 6B)

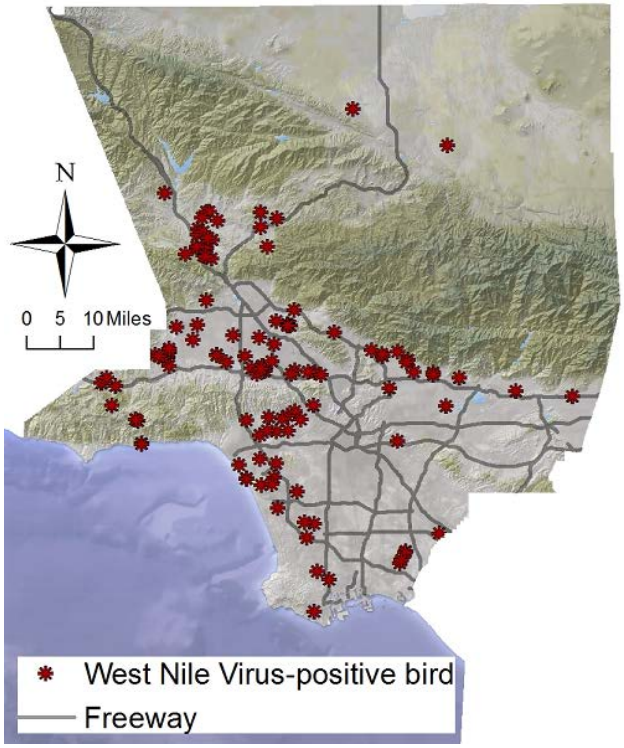
**Figure 6B. West Nile Virus in Dead Birds**
**Los Angeles County, 2014-2016**




**Geographic pattern**

- During 2016, WNV-positive dead birds were detected in multiple areas in LA County (Figure 6C).
- The cities with the highest percentage of WNV-positive birds, and higher risk of exposure to WNV, were:
    - Altadena 100% (of 5 tested)
    - Los Angeles in zip codes starting with 913 and 914 in the San Fernando Valley– 83% (of 36 tested)
    - Santa Clarita – 75% (of 24 tested)

**Figure 6C. West Nile Virus-positive Birds, by location where found, Los Angeles County 2016**



### Limitations

The total number of wild crows in LA County is unknown; therefore, it is impossible to calculate the percent of birds affected by WNV.

Due to the reduction of federal funding for WNV surveillance for the State of California in 2013, VPH discontinued testing of birds for WNV in late August 2013. VPH restarted testing in 2015, however, public reporting of dead birds did not return to levels seen in 2013, and fewer birds were reported and tested.

### Implications and Recommendations

- Monitoring WNV in dead birds offers several benefits to public health.
    - The severity of WNV varies each year. Bird testing can help identify changes in timing and location of WNV exposure risk in a changing climate.
    - Areas within LA County most severely affected by WNV-positive birds correspond to areas of increased human risk.
        - Years in which bird cases are high (i.e. elevated risk in environment) and human cases are low may reflect success in human WNV prevention programs.
    - Bird cases occur about one month before human cases, acting as an early-warning system.
    - WNV cases have a strong seasonal pattern and exposure risk rises in late summer and fall.
- Reduce exposure to mosquitoes through mosquito control.
    - Mosquitoes breed in standing water. Areas of standing water around a property (such as fountains, bird baths, pet water bowls, buckets, gutters, etc.) should be identified and emptied 1-2 times weekly. This helps protect people and animals from WNV, heartworm disease and other mosquito-borne diseases.
    - Wearing long-sleeved clothing and avoiding outdoor areas between dusk and dawn can reduce risk.
    - Large bodies of stagnant water, such as neglected swimming pools, should be reported to the local vector control agency. To find your local vector control agency, enter your zip code at this website: http://westnile.ca.gov/ziplocator.php
- **Report dead birds in LA County to VPH at 213-288-7060**. Only birds that are freshly dead, and collected and put aside in a secure place, can be tested.
- There are no reports of a person getting infected from handling live or dead infected birds. However, the public should avoid bare-handed contact when handling any dead animal. Birds that are to be collected for WNV testing, or are to be discarded, should be picked up using gloves or a shovel, before placing the bird's carcass in a bag. The hands of the person bagging the dead bird should be washed thoroughly afterward.
- Communities should engage in targeted interventions to prevent WNV infections between mid-spring and late fall.

**For More Information:** publichealth.lacounty.gov/vet/WNV.htm

## 7. Methicillin-Resistant Staphylococcal Infections and Co-infections


### Background and Significance

Since the discovery of antibiotics in the 1900s, their use has greatly reduced illness and death due to bacterial infections.[41] While bacteria may develop resistance to antibiotics naturally, continuous overuse and misuse of these products have facilitated the development of widespread resistance.[42] Today, bacteria that are resistant to antibiotics, such as methicillin-resistant Staphylococcus aureus (MRSA), represent a major threat to public health, especially in human healthcare settings.[43]

Antibiotic resistance has been a concern in food-producing animals for many years and is becoming an increasing concern in small animal veterinary medicine.[44] Unlike humans, dogs and cats do not usually harbor Staphylococcus aureus; any MRSA diagnosed in these species is thought to be the result of reverse zoonosis, in which the animals became temporarily colonized through contact with humans harboring the bacteria.[45] However, dogs and cats do commonly carry a related species of bacteria, *Staphylococcus pseudintermedius*, which has also demonstrated antibiotic resistance.[46]

Laboratory tests such as bacterial culture and antibiotic sensitivity are useful in determining the most efficient treatment against a specific infection. Unfortunately, when cost is a limiting factor, veterinarians may not be able to submit every suspect bacterial infection for culture and sensitivity testing. The treatment plan in these cases usually involves empirical antibiotic use, which could possibly contribute to increased bacterial resistance.

While some antibiotic-resistant bacteria do not cause disease, severe infections can occur if the bacteria enter open wounds (e.g. surgical sites) or when they infect individuals with depressed immune systems.[47] Collecting data on antibiotic resistance from small animal veterinary clinics may help uncover trends of antimicrobial resistance in Los Angeles (LA) County.

### Data Sources

Methicillin-resistant staphylococcal infections in animals are reportable in LA County to Veterinary Public Health (VPH) by local veterinarians. Reports were also received for non-methicillin-resistant staphylococcal infections that were resistant to other antibiotics, as well as for co-infections with other species of bacteria. Bacterial resistance to methicillin was not directly recorded by the veterinary diagnostic laboratories; an assessment of resistance to methicillin was based on resistance to oxacillin, another antibiotic in the same class, which can be used to predict methicillin sensitivity.

## Findings

### Totals – Mammals with staphylococcal infections

- In 2016, 89 animals (87 dogs, 1 horse and 1 marine mammal) with methicillin-resistant staphylococcal infections were reported in LA County. Some animals were concurrently infected with multiple staphylococcal species, resulting in a total of 95 isolates reported.
- For the rest of this section, we considered only those cases reported by a single veterinary dermatology practice in LA County in 2016, totaling 80 cases. *S. pseudintermedius* was cultured twice from one animal for two separate episodes of dermatitis; this was reported as two individual isolates. Another animal was infected with two biotypes of *S. pseudintermedius*, bringing the total number of staphylococcal isolates reported from this dermatology practice to 82.
    - The most common resistant species found was *S. pseudintermedius*, with 62 isolates, representing approximately 75% of the total isolates reported. (Table 7A).
    - The most common conditions associated with resistant staphylococcal infections were: dermatitis (69 cases), otitis externa (12 cases), and abscess (1 case) (Table 7A).

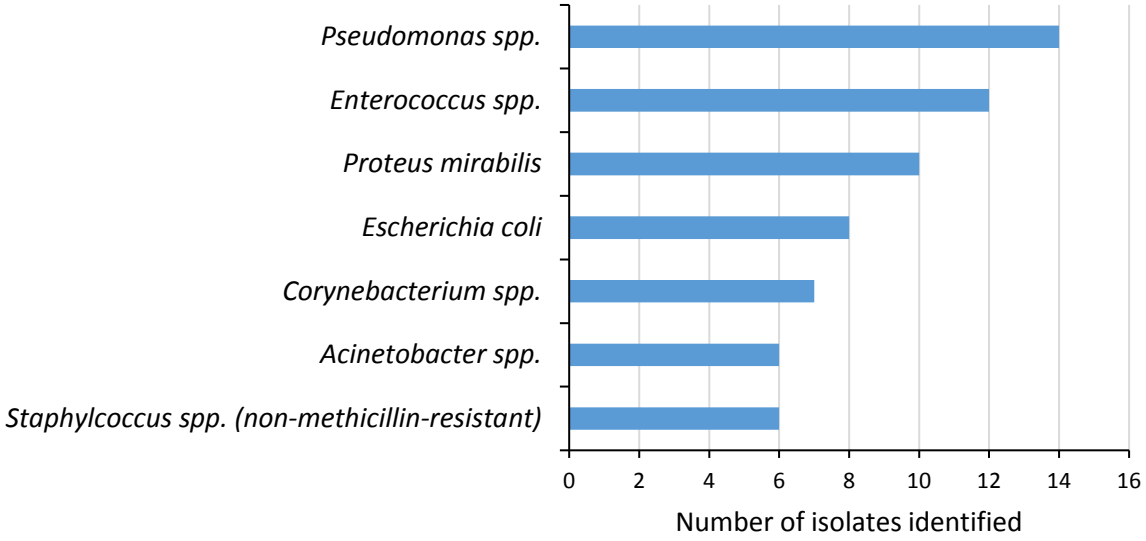
**Table 7A:** Reported methicillin-resistant *Staphylococci* isolates and lesion type (n=82)
From a single veterinary dermatology clinic in Los Angeles County, 2016

| Species | # isolates | Dermatitis | Otitis | Abscess |
|---|---|---|---|---|
| *S. pseudintermedius* | 62 | 53 | 8 | 1 |
| *S. schleiferi* | 19 | 15 | 4 | 0 |
| *S. lentus* | 1 | 1 | 0 | 0 |
| **Total** | 82 | 69 | 12 | 1 |

### Co-infections with other bacteria

- Related to the 80 cases of methicillin-resistant staphylococcal infections reported from this dermatology practice, the most commonly identified bacterial co-infections were with: *Pseudomonas* spp. (14 isolates), *Enterococcus* spp. (12 isolates), *Proteus mirabilis* (10 isolates), *Escherichia coli* (8 isolates), *Corynebacterium* spp. (7 isolates), and *Acinetobacter* spp. (6 isolates). (Figure 7A).
    - There were also 6 co-infections with several staphylococcal species that were not methicillin-resistant.

**Figure 7A: Bacterial co-infections to methicillin-resistant *Staphylococcus* from a single veterinary dermatology clinc in LA County, 2016**

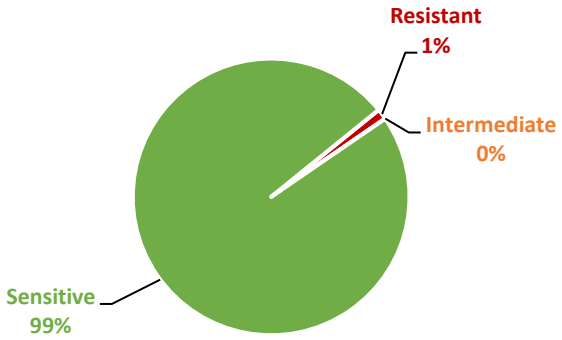



**Staphylococcal antibiotic resistance patterns**

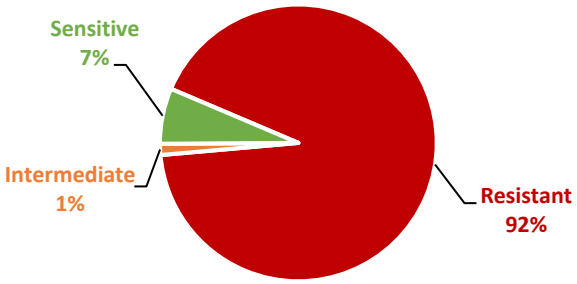
- The resistance of *Staphylococcus* sp. overall, to other antibiotics tested in laboratory bacterial culture and sensitivity panels were variable (Figure 7B).

**Figure 7B. Antibiotic-resistance in Staphylococcal infections to select antibiotics from a single veterinary dermatology practice in LA County, 2016** (n = number of times antibiotic was tested)

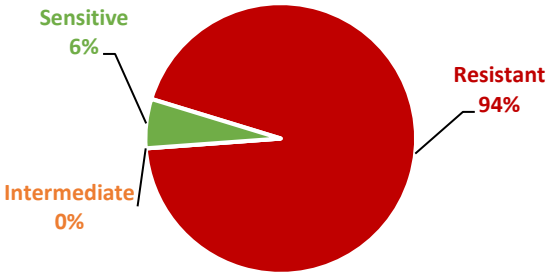
**A.** Resistance pattern to amikacin(n = 83)



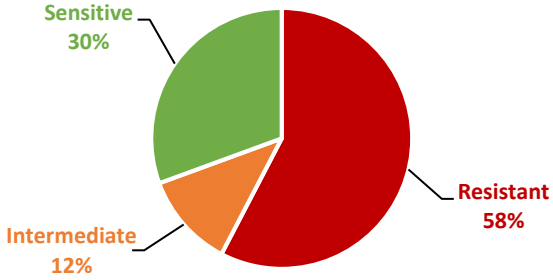

**B.** Resistance pattern to cephalexin (n = 83)



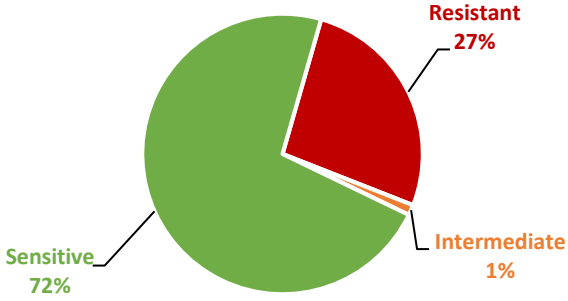

**C.** Resistance pattern to cefovecin (n = 86)



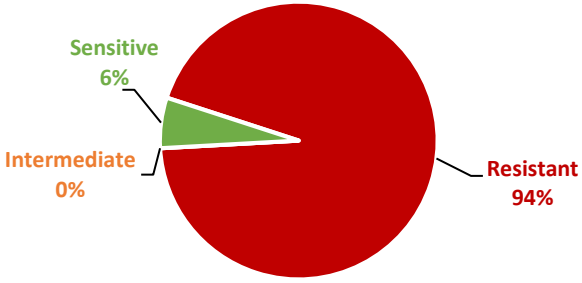

**D**. Resistance pattern to enrofloxacin (n = 85)




**E.** Resistance pattern to chloramphenicol (n = 86)




**F.** Resistance pattern to amoxicillin/clavulanic acid (n = 86)



**Case Examples**

- Methicillin-resistant *S. pseudintermedius* (MRSP) was cultured from the skin of a dog with ongoing dermatitis. This isolate was also found to be resistant to almost all of the antimicrobials tested in the susceptibility panel, only sensitive to amikacin and with intermediate sensitivity to moxifloxacin.
- Methicillin-resistant S. aureus (MRSA) was cultured post-operatively from an enucleation site and ocular implant in a horse. *Escherichia hermannii* and a *Pseudomonas* spp. were also cultured as co-infections. This case was not included in the data analysis for this report.
- Culture from a corneal ulcer in a California sea lion pup found methicillin-resistant *Staphylococcus sciuri*, in addition to co-infections with an *Enterococcus* species, *Pseudomonas* aeruginosa, and *E. coli*. Of interesting note, the *E. coli* was also found to be extremely resistant to antimicrobial therapy, only sensitive to imipenem, amikacin, and polymyxin B. This case was not included in the data analysis for this report.

## Limitations

The data presented is derived only from the limited number of reports received by VPH from a single veterinary dermatology practice, and may not accurately represent the total number or distribution of antibiotic resistant infections in LA County. Considering only reports from a dermatologist possibly over-represents cases of resistant bacterial dermatitis. Veterinarians may not have the ability to submit all suspect cases for bacterial culture and antibiotic sensitivity testing, and also may not be reporting all cases of antibiotic-resistant infections. The antibiotic panels used by the veterinary laboratories when performing antibiotic sensitivity tests are not consistent; the number of times each antibiotic was assessed varied among the cases (see sample sizes in Figure 7B). Some isolates may reflect environmental flora rather than a true disease-causing organism.

## Implications and recommendations

- Antibiotic-resistant infections are detected in LA County veterinary practices. Based on the data collected, the most common methicillin-resistant isolate in small animals continues to be *S. pseudintermedius* (MRSP), a microorganism commonly harbored by dogs and cats. MRSA infections were uncommonly reported in pets.
- With regard to antibiotic-resistant infections, the relationship between animal and human health remains unclear. Although MRSP rarely causes disease in humans, zoonotic transmission of MRSP from animals to humans is possible. [48] Antibiotic-resistant organisms can opportunistically cause severe infections in both animals and humans who are immunosuppressed, or if the bacteria are inoculated into a wound.
- Pet owners should be educated about antibiotic-resistance in bacteria.
    - It is possible for a person to become colonized by MRSA during visits to human healthcare facilities. Pet owners could then transfer the MRSA to their pets, causing temporary colonization or active infection.
    - Pet owners with a history of recent surgery, open wounds, or immunosuppressive conditions should exercise appropriate personal hygiene around their pets to minimize the risk of opportunistic infections (e.g. frequent handwashing and avoiding licks to the face, hands or wounds).

- Empirical antibiotic use to treat suspected bacterial infections without first performing culture and sensitivity testing may promote more antibiotic-resistant bacteria in the environment.
- Veterinarians should strive to consistently submit samples for bacterial culture and antibiotic sensitivity testing prior to prescribing antibiotics for pets. Several guidelines are available regarding:
    - Judicious uses of antimicrobials [49,50]
    - Antimicrobial use for treatment of UTIs in dogs and cats [51]

**For More Information:** publichealth.lacounty.gov/vet/AMR.htm.

## 8. Imported Pets and Public Health

### Background and Significance

In recent years, the pet trade has increased both locally and globally. Between 2002 and 2005, the number of puppies being imported into California tripled, and the majority of puppy imports occurred in LA County.[7]

There are numerous documented animal welfare issues related to some international pet traders, including poor sanitation and lack of immunization of the animals.[52, 53] Imported animals may pose a significant disease risk to LA County, as evidenced by the importation of two separate rabid pets while they were visibly sick. In 1987 a rabid cat was imported from Mexico and in 2004 a rabid dog was imported from Thailand (see p. 10).[7] Other animals imported into the United States have been diagnosed with Monkey Pox, leishmaniasis, screwworm infestations, canine distemper and canine parvovirus.[7, 54, 55] In addition, there is evidence that 2015-16 outbreak of canine influenza H3N2 in the Midwest was related to a single introduction of the virus from South Korea.[56]

The Centers for Disease Control and Prevention (CDC) is the federal agency in charge of regulating imported dogs and cats.[7] Since 2013, CDC regulations state that imported dogs from countries listed as "non-rabies free" were required to be vaccinated for rabies no earlier than 3 months of age, and could legally enter the United States one month after the rabies vaccination was given. Therefore, in 2013, the minimum age at which a dog could legally enter the United States from a country where rabies was present was 4 months.[55] Dogs that arrived from rabies endemic (i.e. non-"rabies free") countries without being vaccinated against rabies were required to be confined at the importer's address until one month after the rabies vaccine was given, with the importer signing a confinement agreement. Pets taken out of the United States were subject upon return to the same regulations as those entering for the first time.

On August 11, 2014, the CDC published new guidance regarding the importation of dogs. It reaffirmed the requirements that all imported dogs, including puppies and service animals, must be healthy on arrival and vaccinated for rabies at least 30 days prior to their arrival into the United States; the earliest legal age of rabies vaccination is 3 months. The new guidance also reaffirmed that dogs from countries considered to be "rabies-free" by the CDC may be imported without proof of rabies vaccine if the dog lived in that country for at least 6 months prior to importation; however, the CDC may deny any dog entry into the United States if it does not meet these requirements. Confinement agreements for unvaccinated imported dogs may still be issued but only if specific requirements are met.[57]
For more information visit: http://www.cdc.gov/importation/bringing-an-animal-into-the-united-states/dogs.html

For pet cats, neither a general health certificate nor rabies vaccination is required by the CDC for entry into the United States, although some airlines or states may have different requirements. However, cats may still be subject to inspection. If a cat appears to be ill, further examination by a licensed veterinarian at the owner's expense may be required at the port of entry.[58]

Note that federal pet importation regulations may change over time. Updated recommendations may be available on websites of the CDC and United States Department of Agriculture Animal and Plant Health Inspection Service (USDA APHIS). For more information visit: aphis.usda.gov/aphis/pet-travel

During the past several years, VPH has assisted the CDC with inspections of selected shipments of dogs at Los Angeles International Airport (LAX) to verify the health status of animals and their ages. VPH compares the physical age of the animal with the age stated on the accompanying paperwork and also enforces local dog importation quarantines within LA County. Not all shipments could be inspected, so larger shipments were prioritized.

### Data Sources

In 2011, VPH and CDC worked with airlines at LAX to create an Advance Notification System for dog imports. Airlines at LAX notify both agencies in advance when a dog is imported as cargo (not when brought in as carry-on). VPH performs live inspections of selected dog shipments, and maintains a database that contains relevant data, including:

- Advance Notifications received from airlines
- Live animal inspections performed by VPH staff
- Information on animals under federal importation quarantines in LA County

### Findings

**Totals - Advanced Notifications and Inspections on imported dogs in 2016:**

- 428 Advance Notifications were received from 17 airlines. This was a slight decrease as compared to 543 Advanced Notifications from 22 airlines in 2015.
    - Of the 428 Advanced Notifications received in 2016, 280 (65%) of these shipments were inspected. The other 35% of shipments were not inspected because they arrived after regular work hours, on the weekends, or due to competing priorities at VPH which did not allow for staff to be at LAX.
    - Dogs were imported from 43 different countries. This is an increase from 2015 data, which showed dogs were imported from only 24 countries.
    - Of the 43 countries where dogs were imported in from, 58% are considered rabies endemic by the CDC. The most common rabies-endemic regions of origin were East Asia, Eastern Europe and South America.
    - 88% of shipments listed a California-based consignee (i.e. importer).
    - French Bulldogs continued to be one of the most popular imported breeds.
    - A total of 9 dogs were issued health orders 2016.
        - The range of diseases that VPH issued health orders for were respiratory disease (coughing, sneezing, nasal discharge), skin disorders, and gastrointestinal disease (diarrhea).
    - 5 puppies (2 separate shipments) were shipped back by the CDC to their country of origin after VPH found that they were underage.

- A local private veterinarian subsequently reported one dog VPH inspected to VPH after it incidentally tested positive for canine heartworm. The veterinarian noted that the dog was imported by an animal rescue group.

### Limitations

The Advance Notification System relies on airlines to report upcoming dog importation shipments to VPH and the CDC. Airlines might not report all imported dogs. VPH does not have access to a master list of all dog shipments; therefore, the total number of dogs imported through LAX is not known.

VPH only collects importation data on dogs coming from other countries through LAX. Dogs coming through neighboring international airports and then driven to LA County are not tracked by the program. Animals traveling into LA County from elsewhere within the United States are not tracked and may have originally come from abroad.

The dog's country of origin is typically assumed to be the country where the dog boarded the flight, as additional information about the animal's origin is usually not available. Prior to the flight, dogs may have travelled from another country that may or may not be considered "rabies-free" by the CDC.

Targeting larger, multiple-dog shipments for inspection may lead to underrepresentation of health issues related to shipments of single animals.

Diagnostic workups are not required for imported animals that are ill; many diseases may be missed by a brief physical exam.

### Implications and Recommendations

- Inspections are helpful for determining if imported pets are sick or old enough to be imported, so it would be valuable for the protocols developed by VPH and CDC at LAX to be replicated at other airports and land crossings throughout the country.
- Collaborative outreach to airlines at LAX by VPH and the CDC has helped to maintain the number of Advance Notifications received by both agencies.
- Many of the dogs that are imported into LA County come from rabies-endemic countries.
- Some frequent importers have websites that advertise their puppies as being bred domestically. As a result, new owners purchasing these dogs may not know that their new puppy is from abroad.
- Pet owners and veterinarians should inquire about the origin of puppies. If the owner of a new puppy did not see the dog's parents, it could be imported.
- VPH is beginning to see a trend in local rescue groups importing in adult dogs in from rabies endemic countries from South America and Asia. Because the consignee (importer) name may be the name of an individual instead of that of a rescue group, the importation activity of rescue groups may be difficult for VPH to track. International rescued dogs may represent an even higher risk for importation of diseases than those part of the commercial pet trade. Dogs that are rescued tend to be stray or street dogs, which have an increased likelihood of exposure to infectious diseases.

- Veterinarians should ask pet owners for copies of any paperwork associated with a new pet and inquire about its origin. Veterinarians should check the teeth to verify the age of puppies, and match the description of a dog to any available paperwork. If the paperwork seems questionable, veterinarians should consider giving vaccine boosters.
- If a dog is sick, veterinarians should consider foreign animal diseases, including rabies. Suspected rabies or any other infectious disease in an imported animal must be reported to VPH immediately.
- Dog owners should pick up and discard feces immediately, not let the puppy mingle with other animals until it is confirmed to be healthy and fully vaccinated, and always wash their hands after handling their puppy or any other animal.

**For More Information:** publichealth.lacounty.gov/vet/PetImport.htm

## 9. Other Diseases, Studies and Investigations

### 2014 – 2016 Feline Panleukopenia

Feline panleukopenia (aka feline distemper) is a vaccine-preventable disease affecting cats. It is highly contagious between cats, but not transmissible to dogs or people. It is spread between cats through direct contact, or indirectly through contamination of the environment with the virus. The virus attacks the intestinal tract and the immune system in cats, causing fever, loss of appetite, vomiting, dehydration, and sometimes diarrhea. Occasionally the only sign is sudden death, especially in kittens. The virus is present in all of the secretions (saliva, urine, feces) of an infected cat. Cats that have been infected can remain contagious for several weeks after recovery. The virus can survive in the environment for more than a year.[59]

Vaccination against panleukopenia is highly effective at preventing infection, and is a part of the standard vaccination recommendations for kittens and cats. To be fully protected, kittens must receive a panleukopenia vaccination 3-4 times before 20 weeks of age. Kittens are most commonly vaccinated at ages 2, 3, and 4 months, followed by a booster one year later. Adult cats are typically revaccinated every 1-3 years.[60]

Surveillance for panleukopenia in Los Angeles County began in 2007. However, it is highly likely that there is significant underreporting of cases, since cats are less likely to be seen by a veterinarian than a dog.[61] Los Angeles County has significant populations of feral cats [62] that are even less likely to be cared for by a veterinarian, or vaccinated.

The feline panleukopenia virus is closely related to the canine parvovirus. As a result, the canine parvovirus ELISA test is often used to test a cat's feces to diagnose panleukopenia. Cases were counted as Confirmed if they has positive ELISA test, and as Suspected if they were not tested but had compatible signs and were linked to Confirmed cases.

*2014-2016 Panleukopenia in Cats in LA County*

- A total of 333 cases were reported
- 70% were confirmed, and 30% were suspected.
- The number of cases reported was highest in 2014 (Figure 9A).
- The median age of the cases across all three years was 2 months. The average age across all years was about 7 months.
- Most cases of panleukopenia were observed in the second half of each year (Figure 9B).
- Cases clustered in the central part of the Los Angeles Basin, the LA Harbor area, the northeastern part of the San Fernando Valley, and in the Antelope Valley (Figure 9C).

**Figure 9A. Panleukopenia in Cats by Year and Case Type (N=337), Los Angeles County, 2014-2016**

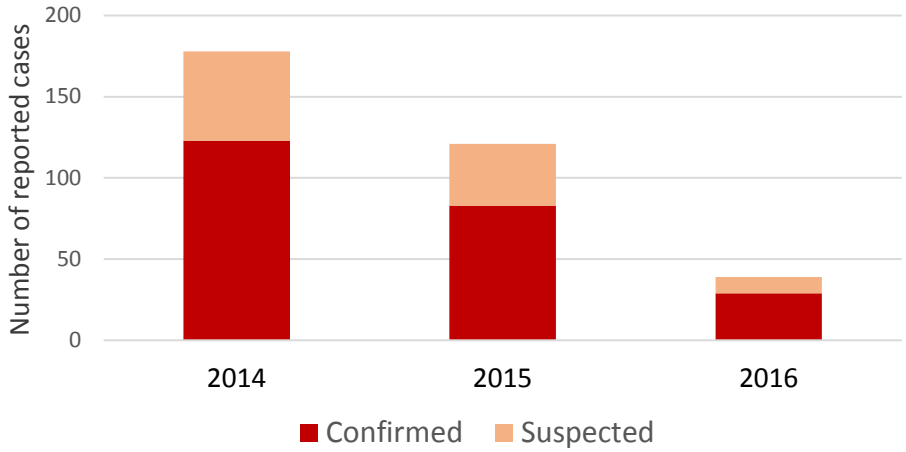
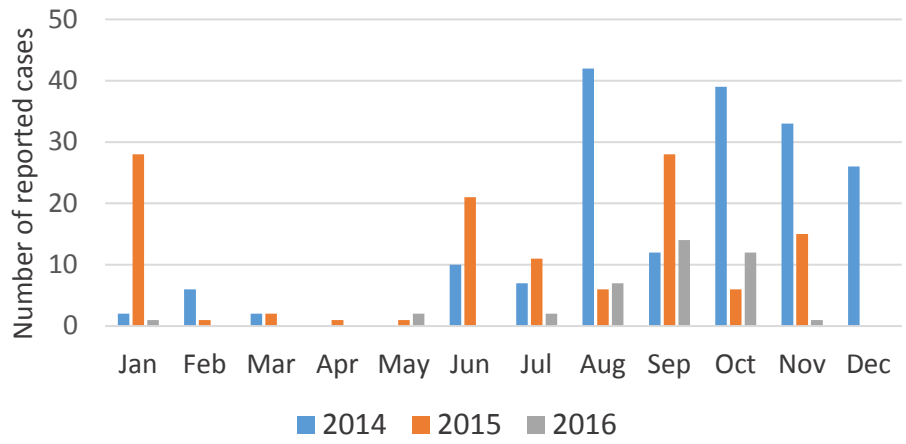
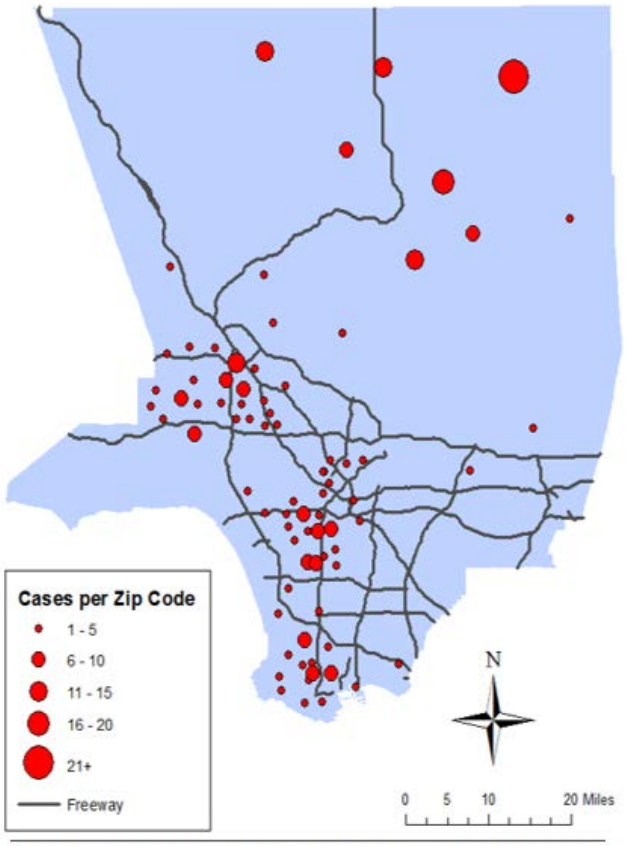



**Figure 9B. Panleukopenia in Cats by Month (N=337), Los Angeles County 2014-2016**



Feline panleukopenia outbreaks can be difficult to control for several reasons. The initial signs (fever, lethargy, loss of appetite) are non-specific and can easily be mistaken for other health problems. In some cases, the only sign is sudden death in the cat. Healthy-appearing cats can spread the virus, because some cats are contagious for weeks after they recover from the infection. The virus can survive a very long time in the environment, so cats can easily be exposed to the virus in an environment even after infected cats are removed.

**Figure 9C. Number of reported cases (N=321*) of Panleukopenia per zip code, Los Angeles County, 2014-2016**




*There are 12 missing zip codes, so these were excluded from results of mapping

Protecting the cats of LA County from panleukopenia involves multiple steps. All kittens and cats should be kept at home until they are fully vaccinated for panleukopenia. Sick cats should immediately be moved away from healthy cats, and tested for the virus. Cages and equipment that have been in contact with sick cats should be thorough cleaned and disinfected. Only a few types of disinfectants kill the virus: freshly diluted bleach (1/2 cup per gallon of water) potassium peroxymonosulfate, and accelerated hydrogen peroxide (not regular hydrogen peroxide) have been shown to kill the virus. Note that commonly used quaternary ammonium disinfectants and alcohol hand sanitizers do not kill the virus.[59] Sick cats should always be handled last, to avoid spreading the virus to healthy cats. This is especially important in any group setting, such as a shelter, rescue group, or cattery, where many cats are at risk of being exposed to the virus.

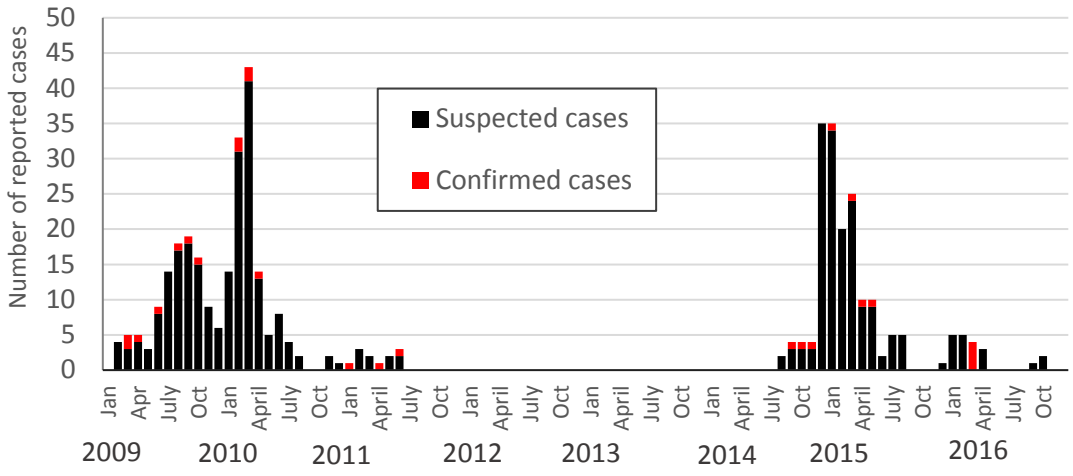
## 2009-2016 Distemper in Raccoons and Other Wildlife

Canine distemper is a highly contagious viral disease that causes a two-phase fever, coughing, nasal and ocular discharges, vomiting and diarrhea. In many cases, neurologic signs such as tremors and seizures also appear. The disease is often fatal in animals. Although this disease does not cause illness in people, it is related to the virus that causes measles. Multiple other species are susceptible to distemper including raccoons, skunks, foxes, ferrets, lions and tigers. Distemper does not cause illness in domestic cats. [63]

Animals infected with distemper can transmit the virus through direct contact with other animals or by contaminating the environment with infectious discharges. Once the virus infects an animal, it spreads throughout the body, suppressing the immune system as well as infecting most body systems. The disease is suspected based on the clinical signs, and confirmed by having either a PCR-positive test on urine or blood, or by having immunohistochemical testing that is positive for the virus in fixed tissues.[63,64]

LA County data show that large outbreaks of distemper occur in local raccoons every few years. The virus can infect other local species, such as skunks, foxes, and dogs.

**Figure 9D. Distemper in Raccoons Los Angeles County, 2009-2016**



*2009 - 2016 Large outbreak of distemper in raccoons, skunks, coyotes, and foxes.*

- Between January 2009 and October 2016, two separate large outbreaks of distemper were reported by animal control agencies. (Figure 9D.)
    - One outbreak occurred during 2009-2011, and the other during 2014-2016.
    - 428 raccoons cases were reported in total across the two outbreaks, with 26 cases confirmed by necropsy.
    - Distemper was also reported in 6 coyotes, 6 foxes, and 17 skunks during the outbreaks, with one fox and one skunk case being confirmed by necropsy.
    - A total of 45 raccoons, 6 skunks, 4 foxes and one coyote from the outbreaks were tested for rabies and all were negative.
    - In both outbreaks, cases were reported across a wide area of the county. The 2009-2011 outbreak centered primarily north of Downtown Los Angeles, while the 2014-2016 outbreak centered on the South Bay region. (Figures 10E and 10F)

**Figure 9E. Locations of Reported Cases of Raccoons with Distemper (n=246), Los Angeles County January 2009-June 2011**

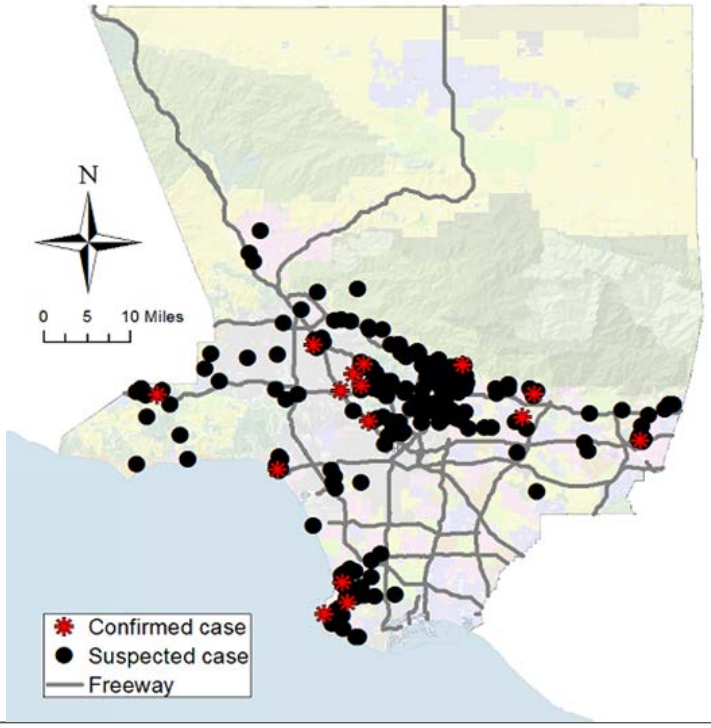
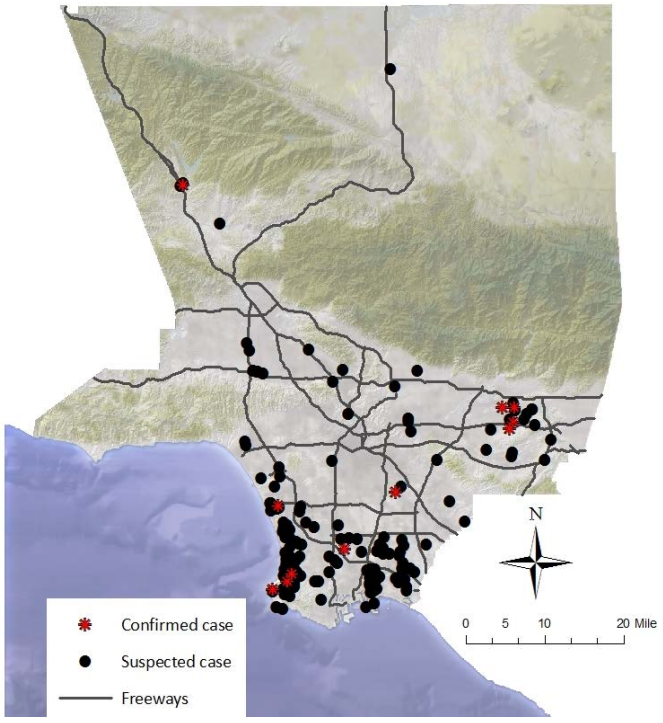



**Figure 9F. Locations of Reported Cases of Raccoons with Distemper (N=182). Los Angeles County, August 2014-October 2016**



*2007 - 2008 Outbreak of distemper in gray foxes in Monrovia*

- Between November 2007 and April 2008, Monrovia Animal Control and the Pasadena Humane Society reported 34 gray foxes with clinical signs compatible with distemper, with one case being confirmed by necropsy. The foxes were found along the foothills of the Angeles National Forest. The other 33 gray foxes were considered to have been suspected cases.

*2005-2006 Outbreak of distemper raccoons in Glendora*

- Between October 2005 and January 2006, Glendora Animal Control reported 18 severely ill raccoons with signs including green oculonasal discharge, diarrhea, dehydration, depression, and lethargy. One case was confirmed as having distemper by necropsy.

Outbreaks of distemper in wildlife serve as a good reminder that wildlife, pets and people may come into close contact and serve as conduits for disease transmission. The public can help reduce the distemper burden in LA County through the following preventive measures: make sure dogs are properly vaccinated against distemper, keep all pet food indoors, keep trash in sealed containers, and never feed wildlife. It is unclear whether dogs or wild animals are the reservoirs for distemper. However, taking preventative measures is essential for protecting animals in the community from this virus.

## 2016 Aliso Canyon Natural Gas Leak

The Southern California Aliso Canyon Storage Facility in the San Fernando Valley began leaking natural gas on October 23, 2015 and was permanently sealed on February 18, 2016. During this time, there was much concern over the possible adverse health effects from the gas leak to humans, pets, and wildlife.[65] VPH became involved in response activities after receiving a report of three dead birds that were found at a residence in the affected area. The birds were submitted for necropsy and VPH began monitoring pet health in the area to determine if animals were being impacted by the leak. VPH developed new tools to gather information from both animal health care providers as well as the public.

*Active Surveillance Efforts*

VPH contacted 17 veterinary hospitals and 3 animal shelters located nearest to the gas leak on a weekly basis to determine if they had seen any animals that may have become ill after exposure to gas fumes. VPH also created and distributed a new animal disease reporting form for veterinarians to report potential illness related to the gas leak. An online reporting portal was also created for the public to also directly report potentially related pet illness to VPH.

By April 10, 2016, VPH received reports for 15 pets from veterinarians. The most common clinical signs reported by veterinarians included respiratory signs, gastrointestinal signs, lethargy, and skin irritation. VPH also received reports on 17 pets directly from pet owners and 3 animal reports initially reported by owners with a follow-up report from the veterinarian. The most common clinical signs reported by pet owners were lethargy, gastrointestinal signs, respiratory signs, skin irritation, eye/mucous membrane irritation, and neurologic signs (See Table 9A).

*Animal Testing*

Three dead warbler birds, found in a private citizen's swimming pool, were recovered by VPH and submitted for necropsy. Based on the results, it was not possible to confirm or rule out any environmental inhalant toxicant as the cause of death.

**Limitations**

Currently there are no readily available diagnostic that can to confirm or rule out whether clinical signs in a pet were caused by the gas leak. Since many of the clinical signs reported were non-specific, it is unclear if they were related to the gas leak or due to existing comorbidities. Many owners' who reported that their pet experienced adverse health effects from the gas leak did not follow up with a veterinarian. Thus, it was unclear if the adverse health effects were related to the gas leak or if the pet had another unrelated concurrent illness. Limited published literature exists regarding the health effects and clinical signs attributed to natural gas leaks in pets.

Although more research is necessary on the health effects of natural gas leaks, this situation demonstrated the public health relationship between humans, pets, and the environment.

| Table 9A. Reports of animals with illness in animals living near the Aliso Canyon Gas leak, 2015-2016. Clinical Signs, health status, housing, and relocation status | | | | | | |
|---|---|---|---|---|---|---|
| | Reports from Veterinarians Only (n = 15) | | Reports from Pet Owners Only (n = 17 animals total) | | Initial Report from Pet Owners with Follow-up Report from Veterinarian (n = 3 animals total) | |
| | Dogs (n= 12) | Cats (n= 3) | Dogs (n= 15) | Cats (n= 2) | Dogs (n= 3) | Cats (n=0) |
| **Clinical Presentation** | | | | | | |
| Lethargy | 3 | 0 | 8 | 2 | 2 | 0 |
| Skin Irritation | 3 | 0 | 4 | 0 | 1 | 0 |
| Respiratory Signs | 8 | 3 | 4 | 0 | 1 | 0 |
| Neurologic Signs | 0 | 0 | 3 | 0 | 2 | 0 |
| Urinary Signs | 1 | 0 | 1 | 0 | 0 | 0 |
| Gastrointestinal Signs | 4 | 3 | 8 | 1 | 1 | 0 |
| Eye/mucous membrane irritation | 0 | 0 | 3 | 0 | 1 | 0 |
| **Health Status** | | | | | | |
| Alive | 8 | 3 | 15 | 1 | 2 | 0 |
| Euthanized | 1 | 0 | 0 | 0 | 1 | 0 |
| Died | 1 | 0 | 0 | 1 | 0 | 0 |
| Unknown | 2 | 0 | 0 | 0 | 0 | 0 |
| **Housing** | | | | | | |
| Indoors only | 8 | 0 | 7 | 1 | 3 | 0 |
| Outdoor (full or part time) | 2 | 0 | 7 | 1 | 0 | 0 |
| Unknown | 2 | 3 | 1 | 0 | 0 | 0 |
| **Relocated** | | | | | | |
| Yes | 5 | 3 | 8 | 0 | 2 | 0 |
| No | 4 | 0 | 7 | 2 | 1 | 0 |
| Unknown | 3 | 0 | 0 | 0 | 0 | 0 |

## Nontuberculous and Rapidly-growing *Mycobacterium* spp –six cases

The *Mycobacterium* genus is mostly well known for two ancient human scourges and one in cattle. In people, *Mycobacterium tuberculosis* causes tuberculosis and *Mycobacterium leprae* causes leprosy (also known and Hansen's disease). In cattle, *Mycobacterium bovis* causes tuberculosis. *M. tuberculosis* grows very slowly compared to many other types of bacteria, dividing once every 15-20 hours.

There are other types of *Mycobacteria* which can also cause infections, but are different from the three listed above. Many people are less familiar with these types of *Mycobacteria*. They are referred to as non-tuberculous *Mycobacteria* (NTM). NTM tend to live in the environment and cause opportunistic infections in immunocompromised animals and people. Many NTM infect animals: some primarily affect pets, while others afflict fish, amphibians, and a wide variety of other vertebrates.[66] A commonly-encountered species of NTM that can cause infections in people and animals is *M. avium*. A subset of NTM that grow much faster than *M. tuberculosis* in culture are known as rapidly-growing mycobacteria, or RGM. Commonly encountered examples of RGM include *M. chelonae*, *M. fortuitum* and *M. abscessus*.

RGMs may cause infection and inflammation of connective tissue (cellulitis), upper respiratory tract infections, and granulomas (infected swellings) inside the body or in the skin. [67] RGM can be resistant to some antibiotics, therefore it is important to identify the type of RGM bacteria and examine its antimicrobial susceptibility pattern.[68]

*Mycobacterium* spp infections (including NTM and RGM) in animals are reportable to the VPH. To date, there have been only 6 cases RGM reported; the case summaries are below.

*Case 1*
In August 2016, an adult male, pit-bull mix was presented to a veterinarian in the San Fernando Valley with firm nodules and hair loss (alopecia) on the ear flaps (ear pinnae). This is a classic presentation site for a condition called canine leproid granuloma, which is typically caused by RGM and is more common in large breed dogs. Fine need aspirates of the nodules were taken and sent for cytology. The microscopic findings revealed a granulomatous inflammation with *Mycobacterium* species consistent with leproid granuloma. The dog was placed on twice doxycycline treatment for a month, and the lesions resolved.

*Case 2*
In April 2015, an adult spayed Domestic Short Hair cat in the South Bay area presented to a veterinarian with rear leg lameness, enlargement of the lymph nodes in the abdomen, enlargement of the liver, and nodules in the liver. The cat's clinical signs gradually worsened to the point of paralysis in all four legs. The cat also had several unrelated health conditions, and was immunocompromised. Ultrasound-guided fine needle aspiration of the liver and lymph nodes in the abdomen and liver revealed a fatty liver (hepatic lipidosis), inflammation and bacteria that were visually confirmed as *Mycobacterium* spp. No further testing was done to identify the exact species, and the cat died later that month.

*Case 3*

In January 2015, an older adult neutered rat terrier in the San Gabriel Valley sustained multiple wounds during a dog fight. The dog's wounds were treated by a veterinarian with antibiotics, but still had not healed after a month of treatment. The wound site was swabbed and cultured. It tested positive for RGM. The culture isolate was forwarded to DPH's Public Health Laboratory, and the species *M. chelonae* was identified. Once the dog was placed on doxycycline and enrofloxacin therapy for approximately one month, and it resolved.

*Case 4*

In March 2015, an older adult neutered Domestic Short Hair presented to a veterinarian in West LA with several-week history of mucous-like nasal discharge that was non-responsive to antibiotic treatment. The cat was known to be infected with Feline Leukemia Virus (FeLV) and therefore was immunosuppressed. The nasal discharge was sent to a veterinary laboratory for culture, and it tested positive for RGM. The culture isolate was forwarded to DPH's Public Health Laboratory, and *M. chelonae* was identified. The cat improved on doxycycline therapy.

*Case 5*

In September 2009, an adult recently-spayed dog in the South Bay area presented to a veterinarian with urine dribbling (incontinence), an enlarged liver and spleen, enlarged lymph nodes in the neck and shoulders and inside the chest, a large amount of free fluid in the abdomen and some in the chest, and fibrous tissue growing around the intestines and urinary bladder. The dog had been recently adopted from an area with livestock and where manure was used as a fertilizer and had had a litter of puppies before being spayed. A large amount of fluid was removed from the abdomen and submitted for culture, which grew a bacteria called *Fusobacterium*. Fibrous tissue from the abdomen was submitted for PCR testing for mycobacteria, and tested positive for the NTM species *M. avium*. The dog also had a low-titer (1:50) positive serology for *Leptospira icterohaemorrhagiae* consistent with a leptospirosis exposure. The dog was treated with doxycycline and enrofloxacin and improved on treatment.

*Case 6*

In February 2008, an adult spayed canine in the South Bay area had a surgically-removed mass from her right lower lip. The mass was not analyzed. Seven months later the mass recurred, and a sample was sent to a veterinary laboratory for analysis. Culture from the mass revealed *M. avium*, which was confirmed by PCR. A second surgical removal and antibiotic regimen was scheduled. The patient's owner was advised to stop the dog from licking the faces of children, and not let the dog have contact with immunocompromised individuals.

**Limitations**

This section covers NTM and RGM case data as reported to VPH from veterinarians practicing in LA County. These types of infections can only be definitively diagnosed by laboratory testing, usually by culture. Many NTM or RGM infections may not be definitively diagnosed in pets if the pet owner is not able to afford to pay for the testing. Therefore, the true incidence of these cases in pets in LA County is unknown. Moreover, when testing is performed, many veterinary laboratories do not identify the exact species of bacteria

involved. The assistance of the Los Angeles County Public Health Laboratory was key in identifying the RGM bacteria *M. chelonae* in three of the six cases reviewed here.

**Implications**

NTM and RGM bacteria are naturally present in the environment, and can cause infections in people and pets. These infections can sometimes be severe, resistant to many antibiotics, and difficult to treat. Therefore, bacterial culture and antibiotic sensitivity testing are very important parts of diagnosing and treating these infections. These bacteria can also cause infections in immunocompromised people. People usually obtain these infections from the environment, not directly from animals. However, if a pet has an NTM or RGM infection, people should always avoid direct contact with infected tissue (such as an open sore on the pet) and should wash hands after handling the animal.

## Helpful Resources

**Overview of Animal Disease Reporting in Los Angeles County**
http://www.publichealth.lacounty.gov/vet/disintro.htm

**Los Angeles County - Priority List of Reportable Animal Diseases**
http://publichealth.lacounty.gov/vet/docs/2016LACountyAnimalReportableDiseaseList.pdf

**Los Angeles County Animal Disease Reporting Forms**
http://publichealth.lacounty.gov/vet/Forms.htm

**Los Angeles County Animal Diseases, Conditions and Data**
http://www.publichealth.lacounty.gov/vet/AnimalDiseaseList.htm

**Consultation with a Los Angeles County Public Health Veterinarian**
All professionals and the public are encouraged to call with questions or a request for a consultation. During working hours (8:00am-5:00pm Monday-Friday), the Veterinarian-On-Duty can be reached at 213-989-7060. Or email us at vet@ph.lacounty.gov.

**Los Angeles County Animal Health Alert Network**
The Animal Health Alert Network is an email system that keeps Veterinarians informed about local animal disease problems or outbreaks. Any animal health worker in Los Angeles County can join. Those interested in joining may contact: vet@ph.lacounty.gov.

**Articles in *Pulse* Magazine - publication of the Southern California Veterinary Medical Association**
Past articles covered local cases of rabies, canine parvovirus trends, flea-borne typhus (a.k.a murine typhus) in humans, avian influenza, and much more. To learn more about the SCVMA, visit http://www.scvma.org.

**World Health Organization (WHO): Veterinary Public Health**
http://www.who.int/zoonoses/vph/en/

**Centers for Disease Control and Prevention (CDC): One Health**
http://www.cdc.gov/onehealth/

**California Department of Public Health (CDPH): Veterinary Public Health Section**
https://www.cdph.ca.gov/programs/vphs/Pages/default.aspx

## References


1. Centers for Disease Control and Prevention. One Health. May 3, 2018. Available at: http://www.cdc.gov/onehealth.
2. Centers for Disease Control and Prevention. CDC and Zoonotic Disease. April 2, 2018. Available at: http://www.cdc.gov/about/facts/cdcfastfacts/zoonotic.html.
3. Office of Assessment and Epidemiology, Los Angeles County Department of Public Health. 2007 Los Angeles County Health Survey Background Summary & Methodology. Available at: http://www.publichealth.lacounty.gov/ha/LACHSBackMeth2007.htm.
4. Veterinary Public Health Program, Los Angeles County Department of Public Health. Important animal laws and regulations. March 2, 2017. Available at: http://publichealth.lacounty.gov/vet/Laws.htm.
5. Khan A. Public health preparedness and response in the USA since 9/11: a national health security imperative. *Lancet*. 2011; 378(9794):953-956.
6. California Department of Public Health. California Code of Regulations – Reportable Diseases and Conditions. July 2016. Available at: https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/ReportableDiseases.pdf
7. Ehnert K and Galland GG. Border Health: Who's guarding the gate? *Vet Clin. North Am*. 2009; 39(2):359-371.
8. Veterinary Public Health Program, Los Angeles County Department of Public Health. Animal Disease Surveillance. October 20, 2015. Available at: http://www.publichealth.lacounty.gov/vet/surveillance.htm.
9. Centers for Disease Control and Prevention. Rabies, Animal. 1997 Case Definition. April 29, 2015. Available at: http://wwwn.cdc.gov/nndss/conditions/rabies-animal/case-definition/1997.
10. California Department of Public Health. California mosquito-borne virus surveillance & response plan. March 2017. Available at: http://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/2017CAMBVirusSurveillanceResponsePlan.pdf.
11. National Association of State Public Health Veterinarians. Compendium of Measures to Control *Chlamydophila psittaci* Infection among Humans (Psittacosis) and Pet Birds (Avian Chlamydiosis), 2017. Available at: http://www.nasphv.org/documentsCompendiaPsittacosis.html.
12. Centers for Disease Control and Prevention. Zoonotic Diseases. April 2, 2018. Available at: http://www.cdc.gov/onehealth/zoonotic-diseases.html.
13. U.S. Centers for Disease Control and Prevention. Surveillance Resource Center. November 7, 2017. Available at: https://www.cdc.gov/surveillancepractice/index.html
14. Ehnert K, Beeler E, Coelho L, *et al.* Healthy Pets, Healthy Families Initiative. February 2014. Available at: http://publichealth.lacounty.gov/vet/docs/2014HPHFCommunityReport.pdf.
15. Henning KJ. Overview of Syndromic Surveillance – What is Syndromic Surveillance? MMWR *Morb Mortal Wkly Rep*. Sept 24, 2004;53(Suppl):5-11. Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/su5301a3.htm
16. Banyard AC, Horton DL, Freuling C, Müller T, and Fooks AR. Control and prevention of canine rabies: The need for building laboratory-based surveillance capacity. *Antiviral Res*. 2013; 98:357-364.
17. Davis A, Gordy P, Rudd R, Jarvis JA, and Bowen RA. Naturally-acquired rabies virus infections in wild-caught bats. *Vector Borne Zoonotic Dis*. 2012; 12(1):55-60.
18. Centers for Disease Control and Prevention. US Declared Canine-Rabies Free. September 7, 2007. Available at: http://www.cdc.gov/news/2007/09/canine_rabies.html.
19. American Heartworm Society. Heartworm Basics. 2018. Available at: https://www.heartwormsociety.org/pet-owner-resources/heartworm-basics.
20. Ledesma N and Harrington L. Mosquito Vectors of Dog Heartworm in the United States: Vector Status and Factors Influencing Transmission Efficiency. *Top Companion Anim Med* 2011; 26(4):178-185.
21. Greater Los Angeles County Vector Control District. Invasive *Aedes* Mosquitoes. 2016. Available at: http://www.glacvcd.org/vector-information/mosquitoes/invasive-mosquitoes
22. Sacks BN, and Caswell-Chen EP. Reconstructing the spread of *Dirofilaria immitis* in California coyotes. *J Parasitol.* 2003;89(2):319-323.

23. American Heartworm Society. Summary of the Current Canine Guidelines for the Prevention, Diagnosis, and Management of Heartworm (*Dirofilaria immitis*) Infection in Dogs. 2014. Available at: https://heartwormsociety.org/images/pdf/Canine-Guidelines-Summary.pdf.
24. American Heartworm Society. Summary of the Current Feline Guidelines for the Prevention, Diagnosis, and Management of Heartworm (*Dirofilaria immitis*) Infection in Cats. 2014. Available at: https://heartwormsociety.org/images/pdf/Feline-Guidelines-Summary.pdf.
25. Greene CE, Sykes JE, Moore GE, Goldstein RE, and Schultz RD. Chapter 42: Leptospirosis. In: Greene CE, editor. *Infectious Diseases of the Dog and Cat, 4th^d Edition*. St. Louis: Elsevier; 2012. p. 431-447.
26. Centers for Disease Control and Prevention. Leptospirosis – Signs and Symptoms. October 27, 2017. Available at: http://www.cdc.gov/leptospirosis/symptoms/index.html.
27. Mitchell, KD. Canine Parvovirus. The Merck Veterinary Manual. Accessed May 2018. Available at: http://www.merckvetmanual.com/mvm/digestive_system/diseases_of_the_stomach_and_intestines_in_small_animals/canine_parvovirus.html?qt=canine%20parvovirus&alt=sh.
28. Welborn LV, *et al.* 2011 AAHA Canine Vaccination Guidelines. Journal of the American Animal Hospital Association. 2017. Available at: https://www.aaha.org/public_documents/guidelines/vaccination_recommendation_for_general_practice_table.pdf
29. Centers for Disease Control and Prevention. Valley Fever (Coccidioidomycosis). May 22, 2017. Available at: http://www.cdc.gov/fungal/diseases/coccidioidomycosis.
30. University of Arizona Health Sciences, College of Medicine – Valley Fever Center for Excellence. 2017. Check for Risk Factors. Available at: http://vfce.arizona.edu/valley-fever-people/check-risk-factors.
31. Centers for Disease Control and Prevention. Symptoms of Valley Fever (Coccidioidomycosis). January 25, 2017. Available at: http://www.cdc.gov/fungal/diseases/coccidioidomycosis/symptoms.html.
32. Greene RT. Chapter 60: Coccidioidomycosis and Paracoccidioidomycosis. In: Greene CE, editor. *Infectious Diseases of the Dog and Cat, 4th^d Edition*. St. Louis: Elsevier; 2012. p. 634-645.
33. Centers for Disease Control and Prevention. West Nile Virus. February 22, 2018. http://www.cdc.gov/westnile.
34. Centers for Disease Control and Prevention. West Nile Virus in the United States: Guidelines for Surveillance, Prevention, and Control, 4th Revision. June 14, 2013. Available at: http://www.cdc.gov/westnile/resources/pdfs/wnvGuidelines.pdf.
35. Center for Food Safety and Public Health. West Nile Virus Infection. August 2013. Available at: http://www.cfsph.iastate.edu/Factsheets/pdfs/west_nile_fever.pdf.
36. Centers for Disease Control and Prevention. West Nile Virus Transmission. December 14, 2017. Available at: https://www.cdc.gov/westnile/transmission/index.html.
37. Nash D, Mostashari F, Fine A, Miller J, O'Leary D, Murray K, et al. The outbreak of West Nile Virus infection in the New York City area in 1999. The *N Engl J Med*. 2001;344(24):1807-1814.
38. Centers for Disease Control and Prevention. West Nile Virus - Final Annual Maps & Data for 1999-2015. July 13, 2016. Available at: http://www.cdc.gov/westnile/statsMaps/finalMapsData/index.html.
39. Healy JM, Reisen WK, Kramer VL et al. Comparison of the Efficiency and Cost of West Nile Virus Surveillance Methods in California. *Vector-Borne Zoonot.* 2015;15(2):147-155
40. Acute Communicable Disease Control Program, Los Angeles County Department of Public Health. West Nile Virus: 2016 - Los Angeles County Epidemiology Final Report. http://publichealth.lacounty.gov/acd/docs/West%20Nile/Arbo2016.pdf.
41. Aminov RI. A Brief History of the Antibiotic Era: Lessons Learned and Challenges for the Future. *Front Microbiol.* 2010;1(134):1-7.
42. Centers for Disease Control and Prevention. About Antimicrobial Resistance. March 5, 2018. Available at: http://www.cdc.gov/drugresistance/about.html.
43. Centers for Disease Control and Prevention. General Information About MRSA in Healthcare Settings. May 23, 2018. Available at: http://www.cdc.gov/mrsa/healthcare/index.html.
44. Centers for Disease Control and Prevention. Antibiotic Use in Food-Producing Animals. January 26, 2018. Available at: http://www.cdc.gov/narms/animals.html
45. Weese JS and Fulford MB Chapter 2: Bacterial Diseases. Weese JS, Fulford MB, editors. *Companion Animal Zoonoses*. Ames:Wiley-Blackwell 2011. p. 188-196
46. Weese JS. Methicillin-resistant *Staphylococcus pseudintermedius* (MRSP) owner information sheet. May 17, 2011. Available at: http://www.wormsandgermsblog.com/files/2008/04/JSW-MA3-MRSP-Owner.pdf.

47. World Health Organization. Antimicrobial resistance. 2018. Available at: http://www.who.int/mediacentre/factsheets/fs194/en.
48. Paul NC, Moodley A, Ghibaudo G, Guardabassi L. Carriage of methicillin-resistant *Staphylococcus pseudintermedius* in small animal veterinarians: indirect evidence of zoonotic transmission. Zoonoses Public Health. 2011; 58: 533–9. doi: 10.1111/j.1863-2378.2011.01398.x. Epub 2011 Jan 31.
49. American Association of Feline Practitioners & American Animal Hospital Association. Basic Guidelines of Judicious Therapeutic Use of Antimicrobials. January 2014. Available at: http://www.catvets.com/public/PDFs/PracticeGuidelines/Guidelines/2014AntimicrobialsGuidelines%20AAHA_AAFP.pdf
50. American Veterinary Medical Association. Judicious Therapeutic Use of Antimicrobials. 2018. Available at: https://www.avma.org/KB/Policies/Pages/Judicious-Therapeutic-Use-of-Antimicrobials.aspx
51. Weese JS, *et al.* Antimicrobial Use Guidelines for Treatment of Urinary Tract Disease in Dogs and Cats: Antimicrobial Guidelines Working Group of the International Society for Companion Animal Infectious Diseases. Veterinary Medicine International. June 27, 2011. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3134992.
52. International Fund for Animal Welfare. How much is that doggie on my browser – The truth behind online puppy sales. 2012. Available at: https://www.ifaw.org/united-states/news/unleashing-truth-about-online-puppy-sales.
53. Dogs Trust. The puppy smuggling scandal – An investigation into the illegal entry of dogs into Great Britain under the Pet Travel Scheme. 2014. Available at: http://www.dogstrust.org.uk/press-materials/dt_puppy_smuggling_report_v12_web(1).pdf.
54. Ehnert K, Kim-Farley R. Chapter 18: Reducing Zoonoses: Controlling Animal Importation. In: Fielding JE and Teutsch SW, editors. *Public Health Practice: What Works*. New York: Oxford Press; 2012. p. 162-171.
55. Centers for Disease Control and Prevention. Multistate Outbreak of Monkeypox – Illinois, Indiana, and Wisconsin, 2003. *MMWR Morb Mortal Wkly Rep*. June 13, 2003;52(23):537-540. Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5223a1.htm
56. Voorhees IEH, Glaser AL, Toohey-Kuth KL, Newbury S, Dalziel BD, Dubovi E, Poulsen K, Leutenegger C, Willgert KJE, Brisbane-Cohen L, Richardson-Lopez J, Holmes EC, and Parrish C. Spread of Canine Influenza A (H3N2) Virus, United States. *Emerg Infect Dis* 2017. 23(12): 1950-1957.
57. Centers for Disease Control and Prevention. Bringing a Dog into the United States. October 12, 2017. Available at: http://www.cdc.gov/importation/bringing-an-animal-into-the-united-states/dogs.html.
58. Centers for Disease Control and Prevention. Bringing a Cat into the United States. September 1, 2016. Available at: http://www.cdc.gov/importation/bringing-an-animal-into-the-united-states/cats.html.
59. Koret Shelter Medicine Program. University of California at Davis. Guidebook: Feline Panleukopenia. April 27, 2017. Available at https://www.sheltermedicine.com/library/guidebooks/?utf8=true&search%5Bslug%5D=feline-panleukopenia
60. American Association of Feline Practitioners. 2013 AAFP Feline Vaccination Advisory Panel Report. *J Feline Med Surg* 2013. 15:785-808. Available at: http://journals.sagepub.com/doi/pdf/10.1177/1098612x13500429.
61. Burns K. Vital Statistics. *J Am Vet Med Assoc* 2013 242(3):280-303. Available at https://www.avma.org/news/javmanews/pages/130201a.aspx
62. Herbst J. The Complicated Politics of L.A.'s Feral Cats. Los Angeles Magazine. September 25, 2017. Available at: http://www.lamag.com/mag-features/politics-feral-cats/.
63. Greene CE and Vandevelde M. Chapter 3: Canine Distemper. In: Greene CE, editor. *Infectious Disease of the Dog and Cat, 4th Edition*. St. Louis: Elsevier; 2012. p.25-42
64. Creevy KE. Canine Distemper Overview. In *The Merck Veterinary Manual* 2018. Available at: http://www.merckvetmanual.com/mvm/generalized_conditions/canine_distemper/overview_of_canine_distemper.html.
65. Los Angeles County Department of Public Health. Aliso Canyon Gas Leak: Results of Air Monitoring and Assessments of Health. February 5, 2016. Available at: http://www.publichealth.lacounty.gov/media/docs/AlisoAir.pdf.

66. Thoen CO. Mycobacterial Infections Other than Tuberculosis. In *The Merck Manual Veterinary Manual* 2018. Available at http://www.merckvetmanual.com/generalized-conditions/tuberculosis-and-other-mycobacterial-infections/mycobacterial-infections-other-than-tuberculosis.
67. O'Brien CR, Fyfe JA, and Malik R. Infections Caused by Rapidly Growing Mycobacteria. In: Greene CE, editor. *Infectious Diseases of the Dog and Cat, 4th^d Edition*. St. Louis: Elsevier; 2012. p. 515-521
68. Malik R, O'Brian CR and Fyfe JA. Canine Leproid Granulomas (Canine Lerosy) In: Greene CE, editor. *Infectious Diseases of the Dog and Cat, 4th^d Edition*. St. Louis: Elsevier; 2012. p. 513-515.

## REPORTING ANIMAL DISEASES / DEATHS

**Always report as soon as possible:**

- Occurrence of any unusual disease
- Outbreak or cluster (3 or more cases) of animal disease/deaths of any cause
- Animal illness concurrent with human illness
- Disease not endemic to area
- Illness in animal recently imported from another country

### Urgency Reporting Requirements

☎ = Report **immediately** by telephone
✉ = Report within **1 working day** of identification
⑦ = Report within **7 calendar days** from time of identification

## DISEASE PRIORITY LIST 2016

| | | |
|---|---|---|
| ✉ All Diseases on the Reportable Disease List of the California Department of Food and Agriculture (CDFA) | ⑦Hemorrhagic gastroenteritis (HGE) of dogs | ☎ Viral Encephalitis (EEE, WEE, VEE, Japanese Encephalitis) |
| ✉ Anaplasmosis | ☎ Hemorrhagic Fevers, viral(Crimean-Congo, Ebola, Lassa, Marburg) | ✉ West Nile Virus |
| ☎ Anthrax | ⑦ Histoplasmosis* | ✉ Yersiniosis |
| ✉ Babesiosis | ✉ Influenza (any type) | ☎ Unusual disease |
| ⑦ Blastomycosis* | ⑦ Leptospirosis | ☎ Outbreak of any disease |
| ☎ Botulism | ✉ Listeriosis | |
| ✉ Bovine Spongiform Encephalopathy | ⑦ Lyme Disease | In Los Angeles County, report all diseases in this list **and the list of the California Department of Food and Agriculture (CDFA)** to the Los Angeles County Veterinary Public Health Program. |
| ☎ Brucellosis (any type) | ✉ Methicillin-resistant *Staphylococcus* spp | |
| ☎ *Burkholderia pseudomallei* | ✉ Mycobacterium spp | |
| ✉ Calicivirus, feline virulent | ⑦ *Onchocerca lupi* | |
| ⑦ Campylobacteriosis | ⑦ Parvovirus | |
| ⑦ Chagas Disease | ⑦ Panleukopenia | |
| ✉ Chronic Wasting Disease | ☎ Plague | |
| ⑦ Coccidioidomycosis | ✉ Psittacosis | |
| ☎ Contamination of food product-suspected | ✉ Pseudorabies | |
| ⑦ Cryptococcosis* | ☎ Q Fever | |
| ⑦ Distemper | ☎ Rabies | |
| ✉ Domoic Acid Poisoning | ⑦ Rocky Mountain Spotted Fever | |
| ⑦ Ehrlichiosis | ✉ Salmonellosis | |
| ☎ Exotic Newcastle Disease | ⑦ Salmon Poisoning Disease | |
| ☎ Foot-and-Mouth Disease | ☎ Screw worm myiasis | |
| ⑦ Giardia | ✉ *Streptococcus equi* (Strangles) | |
| ☎ Glanders | ⑦ Tetanus | |
| ⑦ Heartworm | ☎ Tularemia | |

***Added to list in 2016**

**NOTE:** Ringworm and roundworm are not reportable. **Reporting Forms:** http://www.publichealth.lacounty.gov/vet/Forms.htm

**Phone:** (213) 989-7060 **Email:** vet@ph.lacounty.gov **Fax:** (213) 481-2375.

2016

CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE
ANIMAL HEALTH BRANCH

January 2017

# LIST OF REPORTABLE CONDITIONS FOR ANIMALS AND ANIMAL PRODUCTS*

**Pursuant to Section 9101 of the California Food and Agricultural Code, Title 3 California Code of Regulations § 797 and Title 9 Code of Federal Regulations Section 161.4(f)*

**WHO MUST REPORT:** **Any licensed veterinarian, any person operating a diagnostic laboratory, or any person who has been informed, recognizes or should recognize by virtue of education, experience, or occupation, that any animal or animal product is or may be affected by, or has been exposed to, or may be transmitting or carrying any of the following conditions, must report that information.**

**WHAT TO REPORT:** **Immediately report any animal disease not known to exist in the United States, any event with increased mortality and/or morbidity of unknown cause or source and any toxicology condition likely to contaminate animals or animal products (meat, milk or eggs). Report any emergency condition or regulatory condition. All monitored diseases should be reported by diagnostic facilities.**

**CALL IF YOU SEE:** Vesicles, unusual or unexplained illness, CNS signs, mucosal diseases, hemorrhagic septicemias, larvae in wounds, uncommon ticks, high morbidity or mortality. Some diseases are listed under the major species of concern; if you see compatible signs for such conditions in another species, please report!

## EMERGENCY CONDITIONS
**Report within 24 Hours of Discovery**

**MULTIPLE SPECIES**
- Anthrax (*Bacillus anthracis*)[1]
- Crimean Congo hemorrhagic fever[1]
- Foot-and-mouth disease
- Heartwater (*Ehrlichia ruminantium)*
- Japanese encephalitis
- Melioidosis (*Burkholderia pseudomallei*)
- Rabies of livestock[1]
- Rift Valley fever
- Screwworm myiasis (*Cochliomyia hominivorax* or *Chrysomya bezziana*)
- Surra (*Trypanosoma evansi*)
- Vesicular stomatitis
- Livestock exposed to toxic substances
- Unexplained high mortality or diseased animals

**BOVINE**
- African trypanosomiasis (Tsetse fly diseases)
- Bovine babesiosis (Cattle tick fever)
- Bovine spongiform encephalopathy
- Contagious bovine pleuropneumonia (*Mycoplasma mycoides mycoides* small colony)
- Foot-and-mouth disease
- Hemorrhagic septicemia (*Pasteurella multocida B/Asian* or *E/African*)
- Lumpy skin disease
- Malignant catarrhal fever
- Rinderpest
- Schmallenberg virus/ Akabane
- Theileriosis (*Theilera parva parva* or *T. annulata*)

**CAPRINE/OVINE**
- Contagious agalactia *(Mycoplasma agalactiae)*
- Contagious caprine pleuropneumonia *(Mycoplasma capricolum capripneumoniae)*
- Foot-and-mouth disease
- Nairobi sheep disease
- Peste des petits ruminants (Goat plague)
- Schmallenberg virus/ Akabane
- Sheep pox and goat pox

**PORCINE**
- African swine fever
- Classical swine fever
- Foot-and-mouth disease
- Nipah virus
- Senecavirus A
- Swine vesicular disease
- Vesicular exanthema of swine virus (VESV)

**AVIAN SPECIES**
- Avian influenza (HPAI and H5/H7 LPAI)
- Exotic Newcastle disease
- Turkey rhinotracheitis (Avian metapneumovirus)

**EQUINE**
- African horse sickness
- Dourine (*Trypanosoma equiperdum*)
- Glanders (Farcy; *Burkholderia mallei)*
- Hendra virus (Equine morbillivirus)
- Venezuelan equine encephalomyelitis
- Vesicular stomatitis

**CERVIDS/LAGOMORPHS/CAMELIDS**
- Viral hemorrhagic disease in rabbits (Calicivirus)

## REGULATORY CONDITIONS
**Report within Two Days of Discovery**

**MULTIPLE SPECIES**
- Brucellosis *(B. melitensis, B. abortus, B. suis)*[1]
- Pseudorabies (Aujeszky's disease)
- Tuberculosis (*Mycobacterium bovis)*[1]
- Tularemia[1]

**BOVINE**
- Bovine brucellosis (*Brucella abortus*)[1]
- Bovine tuberculosis (*Mycobacterium bovis*)[1]
- Trichomonosis (*Tritrichomonas fetus*)

**CAPRINE/OVINE**
- Caprine and ovine brucellosis[1] (excluding *Brucella ovis*)
- Scrapie
- Sheep scabies (Body mange; *Psoroptes ovis)*

**PORCINE**
- Porcine brucellosis (*Brucella suis*)[1]
- Pseudorabies (Aujeszky's disease)
- Swine enteric coronavirus diseases (excluding transmissible gastroenteritis)

**AVIAN SPECIES**
- Fowl typhoid (*Salmonella gallinarum)*
- Ornithosis (Psittacosis, avian chlamydiosis; *Chlamydophila psittaci*)
- Pullorum disease (*Salmonella pullorum*)

**EQUINE**
- Contagious equine metritis (*Taylorella equigenitalis*)
- Eastern equine encephalomyelitis
- Epizootic lymphangitis
- Equine herpesvirus myeloencephalopathy (EHM)
- Equine infectious anemia
- Equine piroplasmosis (*Babesia caballi* or *Theileria equi*)
- Western equine encephalomyelitis
- West Nile virus

**CERVIDS/LAGOMORPHS/CAMELIDS**
- Chronic wasting disease in cervids

## WHERE TO REPORT:

**CA Department of Food and Agriculture**
**Animal Health Branch (AHB)**
**District Offices:**

| | |
|---|---|
| **Redding** | **530-225-2140** |
| **Modesto** | **209-491-9350** |
| **Tulare** | **559-685-3500** |
| **Ontario** | **909-947-4462** |

**CDFA- Animal Health Branch**
**Mailing Address: 1220 N Street**
**Sacramento, CA 95814**
**Physical Address: 2800 Gateway Oaks**
**Sacramento, CA 95833**
**Telephone 916-900-5002**
**OR**
**US Department of Agriculture**
**Animal and Plant Health Inspection Services**
**Veterinary Services (VS)**
**10365 Old Placerville Road, Suite 210**
**Sacramento, CA 95827-2518**
**Toll free at 1-877-741-3690**

## MONITORED CONDITIONS
**Report within 30 Days of Discovery**

**MULTIPLE SPECIES**
- Bluetongue
- Echinococcosis/hydatidosis (*Echinococcus* species)
- Epizootic hemorrhagic disease
- Johne's disease (Paratuberculosis; *Mycobacterium avium paratuberculosis*)
- Leishmaniosis
- Q Fever (*Coxiella burnetii*)

**BOVINE**
- Anaplasmosis (*Anaplasma marginale* or *A. centrale*)
- Bovine cysticercosis (*Taenia saginata*)
- Bovine genital campylobacteriosis (*Campylobacter fetus venerealis*)
- Bovine viral diarrhea
- Enzootic bovine leukosis (Bovine leukemia virus)
- Infectious bovine rhinotracheitis (Bovine herpesvirus-1)

**CAPRINE/OVINE**
- *Brucella ovis* (Ovine epididymitis)
- Caprine arthritis/encephalitis
- Enzootic abortion of ewes (Ovine chlamydiosis; *Chlamydophila abortus*)
- Maedi-visna (Ovine progressive pneumonia)
- *Salmonella abortusovis*

**PORCINE**
- Porcine cysticercosis (*Taenia solium*)
- Porcine reproductive and respiratory syndrome
- Swine erysipelas (*Erysipelothrix rhusiopathiae*)
- Swine influenza
- Transmissible gastroenteritis (Coronavirus)
- Trichinellosis (*Trichinella spiralis*)

**AVIAN SPECIES**
- Avian infectious bronchitis
- Avian infectious laryngotracheitis
- Duck viral hepatitis
- Infectious bursal disease (Gumboro disease)
- Influenza A viruses
- Mycoplasmosis (*Mycoplasma synoviae* and *Mycoplasma gallisepticum*)

**EQUINE**
- Equine herpesvirus-1 and 4 (excluding EHM)
- Equine influenza
- Equine viral arteritis

**CERVIDS/LAGOMORPHS/CAMELIDS**
- Camelpox in camels
- Myxomatosis in rabbits

**FISH, AMPHIBIAN, CRUSTACEAN, BEE, AND MOLLUSK**
- **Compatible with the OIE list:**

http://www.oie.int/en/animal-health-in-the-world/oie-listed-diseases-2017/

[1] Diseases in green, seen in any species, are also reportable to California Department of Public Health

**For additional information, contact CDFA (email: cavet@cdfa.ca.gov or visit our website at www.cdfa.ca.gov/ahfss/animal_health) or USDA at http://www.aphis.usda.gov/animal_health**

**Los Angeles County**
**Department of Public Health**
**Veterinary Public Health Program**
313 N. Figueroa St. Rm 1127
Los Angeles, CA 90012

Suggested Citation: Veterinary Public Health, Los Angeles County Department of Public Health. 2016 Animal Disease Surveillance Report.
Publication #: LACO-DPH-CDD-VET-2018.1
http://publichealth.lacounty.gov/vet/reports/2016LACountyAnDisSurvReport.pdf
Published August 2018