

Zoonotic Disease in Colorado: Annual Report

2014

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Communicable Disease Branch
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2014 Colorado Zoonoses Report

Report Year	2009	2010	2011	2012	2013	5-Year Average	2014
Anthrax	0	0	0	0	0	0	0
Brucellosis	0	1	0	2	1	0.8	3
Chikungunya	-	-	-	-	-	-	14
Dengue	-	-	-	-	-	-	10
Hantavirus	2	5	4	3	2	3.2	6
Malaria	26	31	27	30	31	29	30
Plague	0	0	0	1	0	0.2	8
Psittacosis	0	0	0	0	0	0	0
Q-Fever, Acute	7	4	2	9	5	5.4	4
Q-Fever, Chronic	2	0	2	1	3	1.6	2
Rabies, Human	0	0	0	0	0	0	0
Rabies, Animal	103	136	104	183	187	142.6	129
Rocky Mountain Spotted Fever	1	2	3	7	5	3.6	5
Tick-borne Relapsing Fever	0	1	7	7	6	4.2	2
Tularemia	2	3	3	0	2	2.0	16
West Nile Virus	104	79	7	134	321	129	118

Anthrax

Anthrax is a serious infectious disease caused by a bacterium known as *Bacillus anthracis*. Anthrax can be found naturally in soil (as dormant spores) and affects domestic and wild animals around the world. Animals that become infected include cattle, sheep, goats, antelope, and deer. Although it is rare, people can get sick with anthrax if they come in contact with infected animals or contaminated animal products. When anthrax spores get inside the body, they become activated and are no longer dormant. When they become active, the bacteria can multiply, spread out in the body, produce toxins (poisons), and cause severe illness. This can happen when people breathe in spores, eat food or drink water that is contaminated with spores, or get spores in a cut or scrape in the skin. It is very uncommon for people in the United States to get infected with anthrax. In 2014 there were no cases of Anthrax reported.

Disease	2014 Case Count	5-Year Average
Anthrax	0	0

Arboviral Disease

Arboviral disease is a condition caused by one of a number of viruses that are transmitted by mosquito or tick bites. Arboviruses represent a number of different classes of virus but normally cause similar types of illness in humans. The common symptoms of arboviral infection include fever, headache, and progression to neurologic disease which can sometimes lead to death. On October 15, 2014 Arboviral diseases (in addition to West Nile virus) were added to the laboratory reportable list to read, 'West Nile virus (acute infection) and other Arboviral diseases.' Conditions that fall under this classification include California Encephalitis Serogroup, Chikungunya, Colorado Tick Fever, Dengue, Eastern Equine Encephalitis, Japanese Encephalitis, La Crosse Encephalitis, Powassan, Saint Louis encephalitis, Western Equine Encephalitis, and Yellow Fever. Due to the recent and concerning emergence of Chikungunya and Dengue in popular travel destinations of Coloradoans, CDPHE retrospectively gathered information on the number of cases of these conditions that affected Colorado residents in 2014. With the exception of Chikungunya, Dengue, and West Nile virus, no other arboviral diseases were reported CDPHE in 2014.

Disease	2014 Case Count	5-Year Average
Chikungunya	14	Not reportable
Dengue	10	Not reportable

Brucellosis

Brucellosis is a disease caused by several species of *Brucella* bacteria. People who get brucellosis are most commonly affected by *B. melitensis*, *B. abortus*, or *B. suis*. Brucellosis is also known as Bang's disease, Crimean fever, Gibraltar fever, Malta fever, and undulant fever. A number of animal species are at risk for infection with *Brucella* bacteria including goats, sheep, cattle, pigs, seals, and various marine mammals. The disease in people can cause a range of symptoms including fevers, sweats, malaise, muscle pain, and fatigue. If left untreated the disease may persist or reoccur for life. Chronic infection results in recurrent fevers (undulant), arthritis, swelling of specific organs, and possibly neurologic symptoms. People can become infected by eating or drinking unpasteurized dairy products, ingesting undercooked meat, breathing in the bacteria in a laboratory, or through direct contact with infected animals. Three human cases of Brucellosis were reported in Colorado in 2014.

Disease	2014 Case Count	5-Year Average
Brucellosis	3	0.8

Hantavirus

Hantavirus pulmonary syndrome (HPS) is a disease caused by an RNA virus in the Family Bunyaviridae. There are numerous hantaviruses associated with different rodent hosts found worldwide. The cause of HPS in the western USA is Sin Nombre virus. Peridomestic exposure has been associated with most human infections in Colorado. Activities such as cleaning rodent infested homes or structures, working in enclosed spaces (like a crawlspace or shed), moving woodpiles, clearing brush and junk piles and other work that disturbs areas contaminated with mouse

droppings are associated with greatest risk of contracting the disease. Many cases reported seeing a large, rapid, increase in numbers of mice around the house prior to becoming ill. Entering structures that have been closed or uninhabited for long periods of time can pose a potential risk. Occupationally acquired infections have been recognized but are infrequent. Potential occupational exposures have included ranchers and farmers, field mammalogists, agricultural workers, construction, utility and feedlot workers. The risk of exposure for campers, hikers, and tourists is very small. Risk of infection can be reduced with simple steps to reduce contact with mice and their excreta.

Disease	2014 Case Count	5-Year Average
Hantavirus	6	3.2

Malaria

Malaria is a disease of humans caused by a parasite known as *Plasmodium*. There are four parasites in this group that commonly cause illness in humans; *P. vivax*, *P. falciparum*, *P. ovale*, and *P. malariae*. Classic malaria involves recurrent bouts of fever, chills, sweats, and headache. Many other symptoms can occur affecting the gastrointestinal, respiratory, muscular, and neurological systems. Treatment is with antimalarial drugs and supportive care. Transmission occurs by the bite of infected anopheline mosquitoes. Local transmission is rarely seen in the United States, but may occur through blood contact (e.g., transfusions or needle-sharing). There are many other countries where malaria transmission still regularly occurs. Tourists, military personnel, business travelers, mission workers, immigrants and refugees are at risk of acquiring malaria if they travel to endemic locations. When traveling in risk areas avoid mosquito bites, take medication to avoid malaria, and receive proper treatment if infected. In 2014 there were 18 people in Colorado reported to have malaria. Travel exposures were mainly to locations on the African continent.

Disease	2014 Case Count	5-Year Average
Malaria	30	29

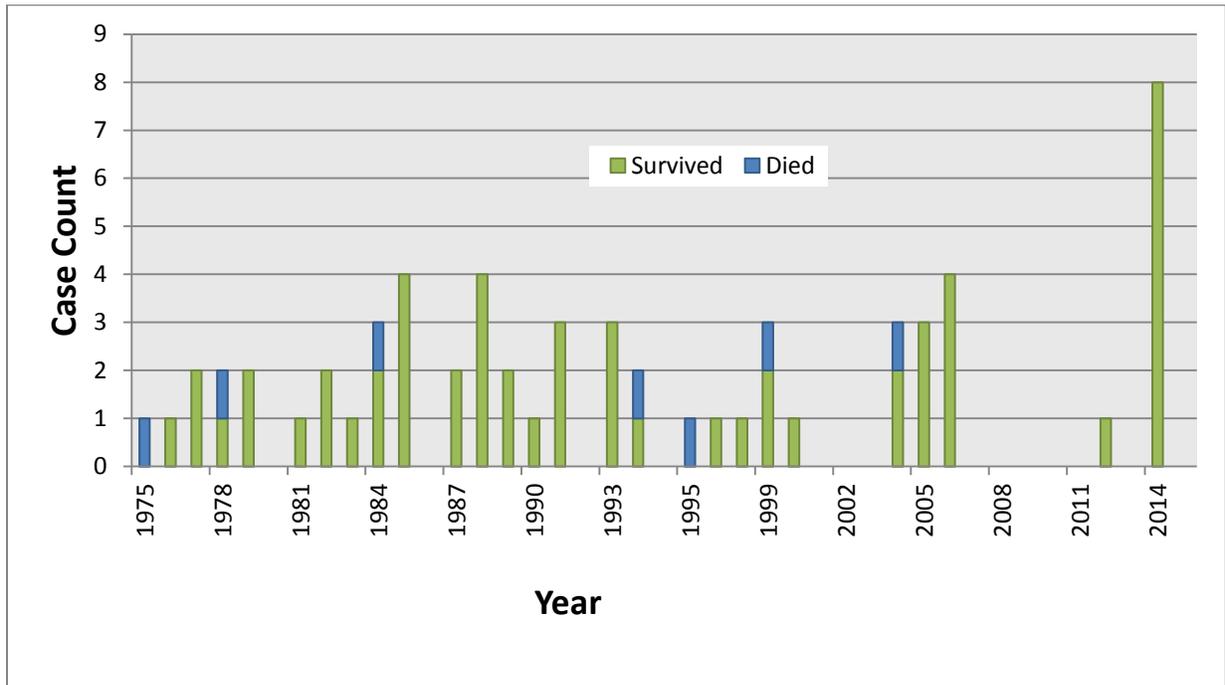
Plague

Plague is a disease caused by a bacterium known as *Yersinia pestis*. There are several forms of the disease which results in different symptoms. Each syndrome has its own sub-name. The most common syndromes are bubonic, septicemic, and pneumonic. Bubonic plague causes painful, swollen lymph nodes, fever, headache, and chills; septicemic plague is a blood infection that results in high fever, chills, abdominal pain, and shock, septicemic plague may cause tissues such as fingers, toes, and nose to turn black and die; pneumonic plague causes a fever, headache, weakness, and a rapidly developing pneumonia and if left untreated can lead to respiratory failure and shock. Pneumonic plague is the only form that is transmissible from person-to-person. The bacterium is transmitted to people by flea bites or direct contact with infected animals. Plague is treatable with antibiotics. Colorado reported eight human cases of plague in 2014, the highest number since reporting began in 1975. An outbreak in the summer that originated from an infected pet dog contributed to the high number of cases seen. Fortunately all human cases in 2014 survived and recovered. The etiological agent of plague, *Yersinia pestis*, was also active in the animal

kingdom. Of 24 samples testing positive for plague, 4 were rodents, 16 were flea pools, 2 were domestic animals (cat and dog), and 2 were non-rodent wildlife (rabbit and bobcat).

Disease	2014 Case Count	5-Year Average
Plague	8	0.2

Human Plague, Colorado 1975-2014



Psittacosis

Psittacosis is caused by the bacterium *Chlamydophila* (previously *Chlamydia*) *psittaci*. Symptoms began as typical influenza-like illness including abrupt onset of fever, chills, headache, and nonproductive cough. The condition may progress to shortness of breath and pneumonia. Treatment is with antibiotics. Birds in the parrot family (psittacine) can be a reservoir for the bacterium. Poultry, pigeons, canaries, and water fowl are less commonly affected. Infection usually occurs when a person inhales organisms excreted in aerosolized dried feces or respiratory tract secretions of infected birds. In 2014 there were no human cases of psittacosis reported in Colorado.

Disease	2014 Case Count	5-Year Average
Psittacosis	0	0

Q-Fever

Q-Fever is a disease caused by the bacterium *Coxiella burnetii*. There are two forms of the disease, acute and chronic. Acute Q-fever symptoms are fever, cough, chills, retrobulbar headache, malaise, weakness, and night sweats. Chronic Q-fever manifests primarily as endocarditis but other

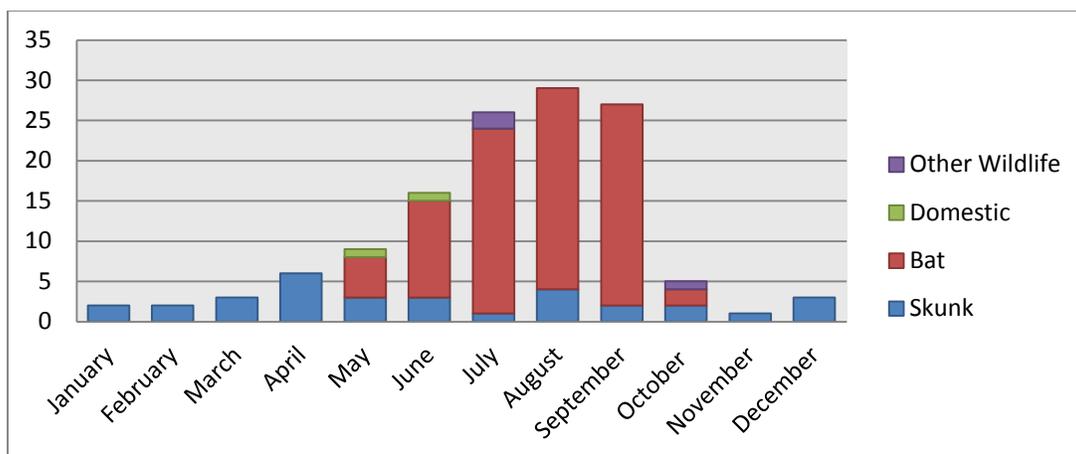
symptoms are possible with or without the development of endocarditis. Treatment is with antibiotics. The bacterium is commonly present in the environment and may persist for years. Livestock including cattle, goats, and sheep can carry the bacterium and occupational exposure to these animals may carry disease risk. Infected animals shed the organism in highest concentration in birthing products but also in urine, feces, and milk. A common exposure mechanism is inhalation of dust from premises contaminated by placental tissues, birth fluids, or excreta of infected animals. Pregnant women, people with certain pre-existing heart conditions and immunosuppressed persons are at increased risk of developing chronic infection. In 2014 there were 3 case of acute Q-fever and 2 chronic cases reported in Colorado.

Disease	2014 Case Count	5-Year Average
Q-Fever, Acute	4	5.4
Q-Fever, Chronic	2	1.6

Rabies

Rabies is a disease caused by a virus with the same name. Rabies virus infects the central nervous system causing neurological symptoms that almost always progress to death. Some symptoms that occur prior to death include insomnia, anxiety, paralysis, hallucinations, increased production of saliva, difficulty swallowing, and fear of water. Rabies is transmitted by the bite of an infected animal. All mammals are susceptible to rabies but a few are known as reservoir species. An infected reservoir species is more likely to transmit the virus to other animals and humans. The species of most concern in Colorado are bats and striped skunks. For this reasons, bats, skunks, and other wildlife should not be handled. If a wild animal allows a person to approach and handle it, the animal is probably ill or injured and will bite in self-defense. A healthy wild animal will usually remain well-hidden and avoid human contact. In 2014, the Colorado Department of Public Health & Environment (CDPHE) Laboratory and Colorado State University (CSU) Veterinary Diagnostic Laboratories confirmed rabies infection in 129 animals in Colorado: 92 bats, 32 skunks, 1 fox, 1 raccoon, 1 coyote and 2 domestic cats. This number mainly reflects those animals that have been tested due to encounters with people, pets, or livestock; many more have not been tested. Of these 129 positive animals, 76 were known or strongly suspected of exposing 101 domestic animals and 57 people.

Laboratory Confirmed Rabies Positive Animals, Colorado 2014



The last human case of rabies in a Colorado resident was in 1931. No cure exists for rabies once symptoms appear. Preventive medication is available for people known or suspected to have been bitten by a rabid animal. It is critically important for people bitten or scratched by a wild animal or an unfamiliar domestic animal to contact their health care provider.

Disease	2014 Case Count	5-Year Average
Rabies, Human	0	0
Rabies, Animal	129	142.6

Rocky Mountain Spotted Fever

Rocky Mountain spotted fever is a disease caused by the bacterium *Rickettsia rickettsii*. The bacterium is transmitted to people by the bite of an infected tick. Symptoms include fever, headache, abdominal pain, and vomiting. After a few days of illness a rash may develop but not all people will get the rash. If not treated early the disease may become severe and life-threatening. Rocky Mountain spotted fever is treatable with antibiotics. The species of tick that can carry the bacteria are the American dog tick (*Dermacentor variabilis*), the Rocky Mountain wood tick (*Dermacentor andersoni*), and the brown dog tick (*Rhipicephalus sanguineus*). Reducing exposure to ticks, checking your-self for ticks and removing attached ones immediately is the best way to prevent infection with tick-borne diseases. In 2014 there were five cases of Rocky Mountain spotted fever reported.

Disease	2014 Case Count	5-Year Average
Rocky Mountain Spotted Fever	5	3.6

Tick-borne Relapsing Fever

Tick-borne relapsing fever is caused by a spiral-shaped bacteria (spirochete) known as *Borrelia hermsii*. Symptoms include a fever lasting a median of three days (range 2-7 days) followed by an afebrile period lasting a median of 7 days (range 4-14 days). This cycle may reoccur from 1 to 10 times if untreated. In addition to the cyclical fever, there may be shaking chills, sweats, headache, muscle or joint pain, and occasionally a rash. Treatment is with antibiotics. The most common reservoirs for the spirochete are wild rodents. The vector tick is *Ornithodoros hermsi*, which is a soft tick that can be found between 1500 and 8000 feet. The ticks live in rodent nests and inflict painless bites at night that are often unnoticed. To prevent tick-borne relapsing fever avoid sleeping in rodent infested buildings and rodent-proof structures to prevent future colonization by rodents and their soft ticks. In 2014 there were two cases of tick-borne relapsing fever reported in Colorado.

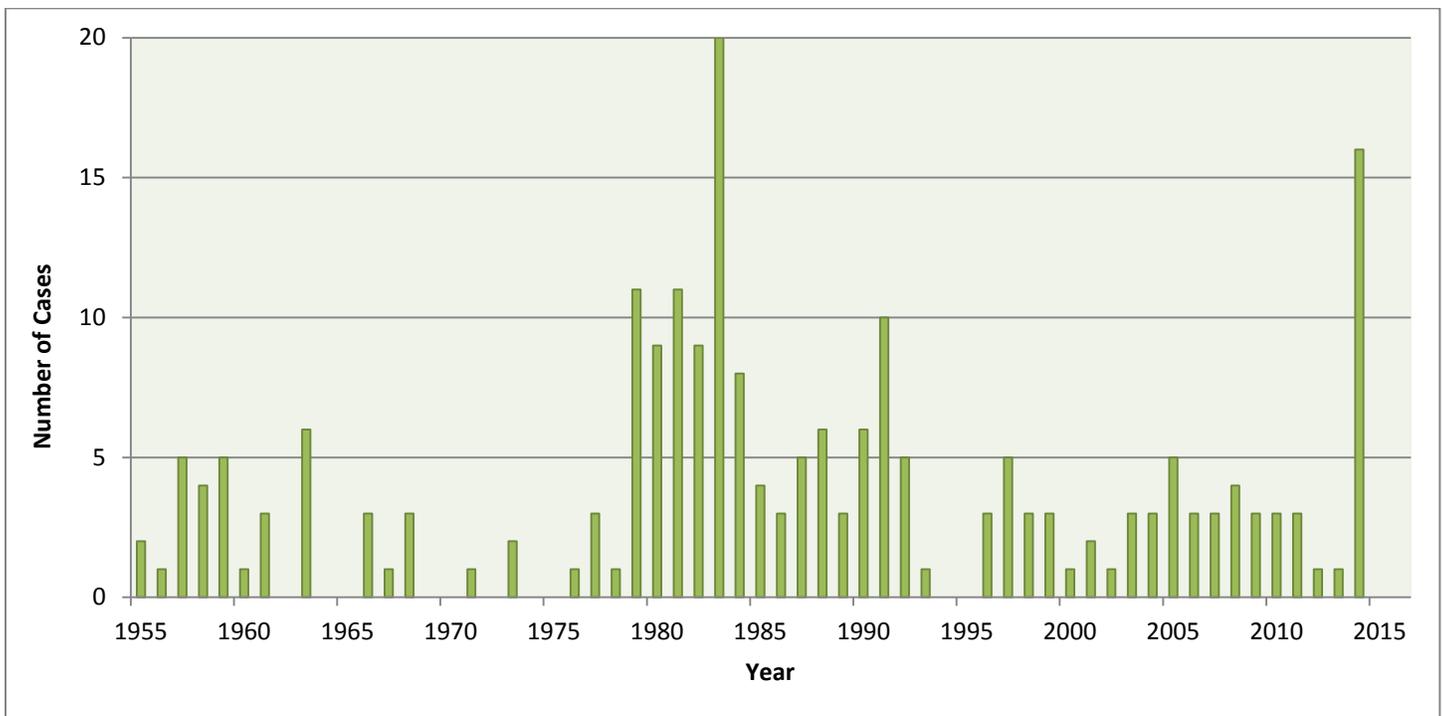
Disease	2014 Case Count	5-Year Average
Tick-borne Relapsing Fever	2	4.2

Tularemia

Tularemia is a disease caused by the bacterium *Francisella tularensis*. Disease in humans is often referred to as rabbit fever. Symptoms vary and depend on how the bacteria entered the body (route of infection). The primary forms of disease are ulceroglandular (a skin ulcer and swollen lymph nodes), glandular (swollen lymph nodes and no ulcer), typhoidal (blood infection or septicemia), and pneumonic (cough, chest pain, and difficulty breathing). Tularemia is commonly associated with rabbits and rodents. Sixteen people in Colorado were diagnosed as having a clinical illness from infection with *Francisella tularensis* in 2014, the etiological agent of tularemia. These cases presented with a diverse range of symptoms including glandular/ulceroglandular, pneumonic, gastrointestinal, and typhoidal. In 2014, 37 animals tested positive for tularemia in Colorado. Twenty-three of these animals were rabbits and 10 were rodents. A total of 62 dogs and cats were tested for tularemia; 2 cats and 2 dogs were positive.

Disease	2014 Case Count	5-Year Average
Tularemia, Human	16	2.0

Human Tularemia Cases, Colorado 1955-2014



West Nile Virus

West Nile virus is the most common arboviral disease in Colorado. The virus has continued to impact Colorado residents since its introduction here in 2002. The disease is transmitted to humans most often by the bite of an infected mosquito. Other modes of WNV transmission have been described, including organ transplant, receipt of blood products, breastfeeding and intrauterine

transmission. These modes of transmission occur infrequently. The reservoir animal for West Nile virus is birds. Other animals, particularly horses, are susceptible to infection but do not serve as reservoirs. In Colorado, WNV human cases can be identified as early as May and as late as December of each year with the vast majority of cases identified in August and September. During the most common transmission months (June-August) mosquito surveillance is conducted to determine the prevalence of virus in the mosquito population and guide decisions on when to conduct mosquito control activities.

In 2014, a total of 118 cases of human West Nile virus (WNV) infection were identified in Colorado from 25 different counties. In addition to the human cases of WNV, a total of 4 horses from 3 counties (Adams, Larimer, and Weld), 1 sheep (Pueblo), and 1 goose (Jefferson) were confirmed by laboratory testing. CDPHE increased surveillance for avian WNV by encouraging submission of samples from sick/dead birds from the raptor rehabilitation centers in Colorado; this resulted in positive results in 4 birds of prey.

The diagnosis of WNV is based on clinical suspicion and WNV testing. Human testing is conducted at the state health department laboratory and most commercial laboratories. Clinical disease ranges from mild febrile illness to severe encephalitis. However, most WNV infections (80%) are asymptomatic. For the purpose of surveillance and reporting, West Nile virus is categorized into two primary groups based on clinical presentation: neuroinvasive disease (meningitis or encephalitis) and non-neuroinvasive disease (fever). During the 2014 season, 46 people (39% of cases) experienced the more severe neuroinvasive presentation which resulted in 4 deaths. The deaths were all in persons over the age of 50 with underlying health conditions.

Disease	2014 Case Count	5-Year Average
West Nile virus, Human	118	129

For additional information on specific zoonotic diseases please visit <https://www.colorado.gov/pacific/cdphe/animal-related-diseases>.