



# WEST VIRGINIA ANIMAL RABIES ANNUAL REPORT 2019

## **INTRODUCTION**

Rabies is a fatal but preventable disease in mammals caused by the rabies virus. The rabies virus is transmitted through saliva or brain/nervous system tissue and can be spread to people and pets if they are bitten or scratched by a rabid animal. While the virus is most commonly transmitted through the bite of a rabid animal, it can also be transmitted when fresh saliva from a rabid animal comes into contact with wounds or mucous membranes (i.e., eyes, nose, mouth).

The rabies virus infects the central nervous system and ultimately causes disease in the brain. Once a person begins to exhibit signs of the disease, the result is nearly always death. Early symptoms of rabies include fever, headache, and general weakness or discomfort. As the disease progresses, more specific symptoms appear and may include insomnia, anxiety, confusion, slight or partial paralysis, excitation, hallucinations, agitation, hypersalivation (increase in saliva), difficulty swallowing, and hydrophobia (fear of water). Death usually occurs within days of the onset of these symptoms.

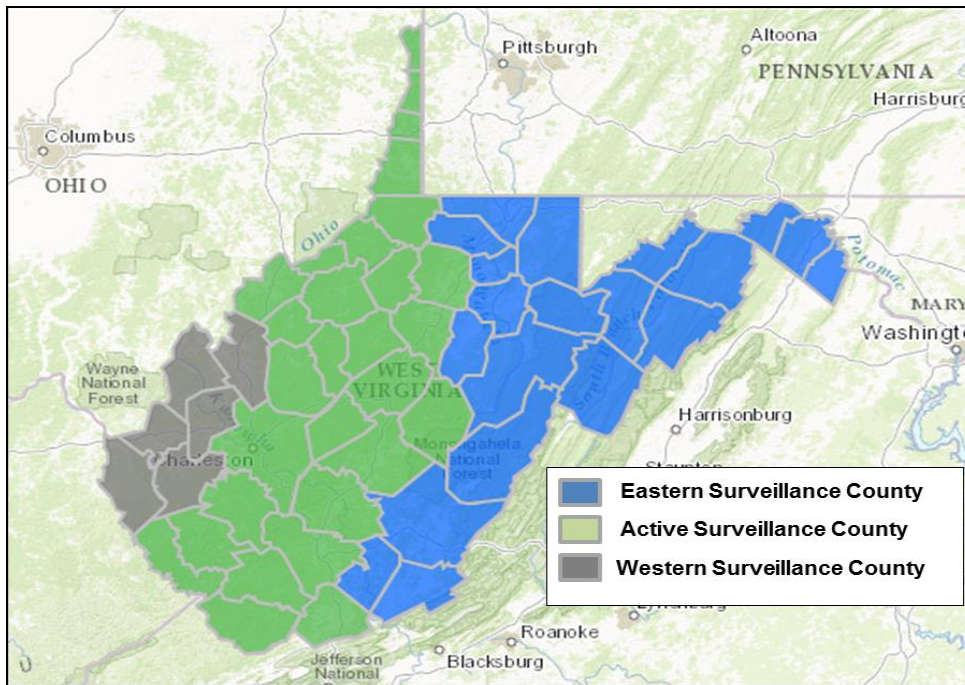
All species of mammals are susceptible to rabies virus infection but only a few species serve as important reservoirs and vectors for the disease. In the United States, distinct strains of rabies virus have been identified in raccoons, skunks, foxes, coyotes and several species of insectivorous bats. In West Virginia, the most commonly found strain of rabies is racoon strain; bat strain rabies is also found and is widespread across the state.

### ***Reporting, Preventive Measures and Surveillance***

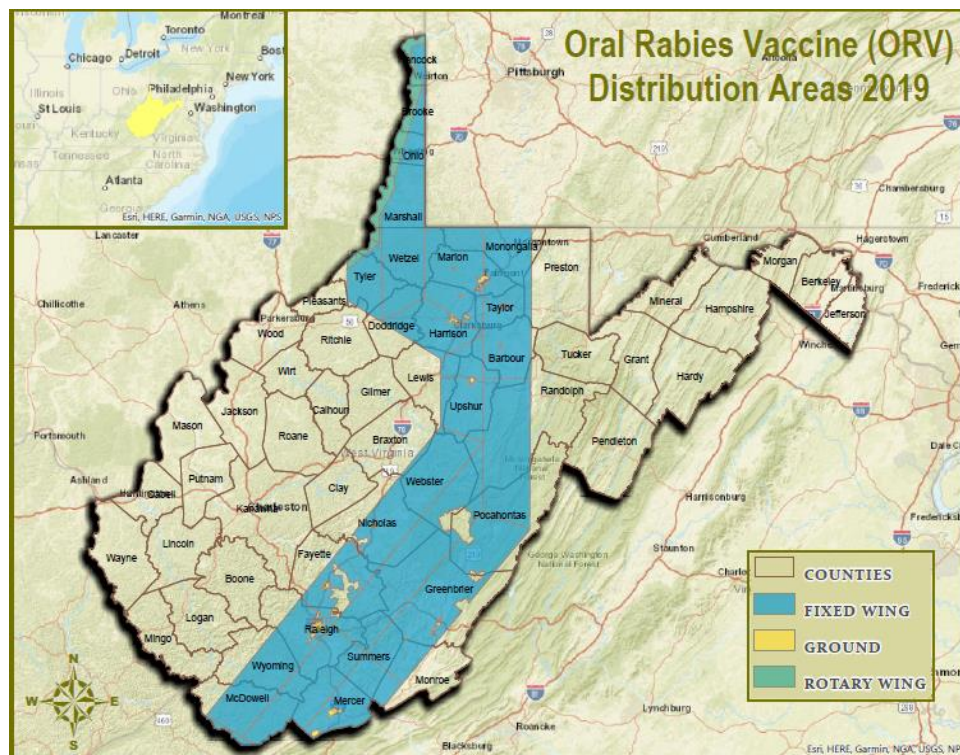
Rabies is classified as a Category II infectious disease, and any case in a human or animal is required by state law to be reported to a local health department (LHD) within 24 hours to help prevent the spread of the disease.

For rabies surveillance, West Virginia is divided into three regions: Eastern Surveillance Region, Active Surveillance Region, and Western Surveillance Region (Figure 1). Raccoon strain rabies is prevalent in the Eastern Surveillance Region and counties within this region report the greatest number of animal rabies cases. The Active Surveillance Region serves as a buffer zone between the Eastern and Western Regions and counties within this region report lower numbers of raccoon strain rabies. No cases of raccoon strain rabies have been reported in the Western Region.

Surveillance and preventative measures, including targeted vaccination, have been implemented to prevent the westward expansion of raccoon strain rabies. The US Department of Agriculture (USDA) initiated the Oral Rabies Vaccine (ORV) Project in 1997 to prevent the geographic spread of rabies in the US. Every August, vaccine baits are spread by plane to targeted areas where expansion of rabies is a concern. Vaccine baits are also distributed in targeted areas by rotary wing and ground applications. In West Virginia, the bait zone includes counties in both the Active Surveillance and Eastern Regions. The hope is that uninfected raccoons and skunks will eat the bait and become inoculated against the virus, thus preventing further spread of the rabies among wildlife. Figure 2 shows the ORV bait zone for West Virginia in 2019.



**Figure 1.** Rabies surveillance regions in West Virginia based on monitoring for raccoon strain rabies.



**Figure 2.** ORV Project distribution areas for 2019 (Courtesy of USDA).

Since the rabies virus affects the central nervous system of mammals, testing the brain of a suspected rabid animal is the best way to determine if an animal is actually rabid. Specimens are sent to the West Virginia Department of Health and Human Resources (DHHR), Bureau for Public Health, Office of Laboratory Services (OLS) for testing. To monitor rabies activity in West Virginia, data are collected and analyzed each year. This information is compiled into a report detailing rabies surveillance activities and testing results for the previous year.

## **METHODS**

### ***Specimen Submission***

Whole specimens from smaller animals (bats, small rodents) and heads from larger animals were shipped on ice to OLS for testing. If the specimen was too large for shipping, only the brain was sent.

### ***Testing***

Specimens were tested using the direct fluorescent antibody (DFA) test to detect the rabies virus in brain tissue. Only specimens that contained a brain specimen in satisfactory condition (had not been buried, did not show signs of decomposition, etc.) were tested. The USDA also tested animals for surveillance purposes.

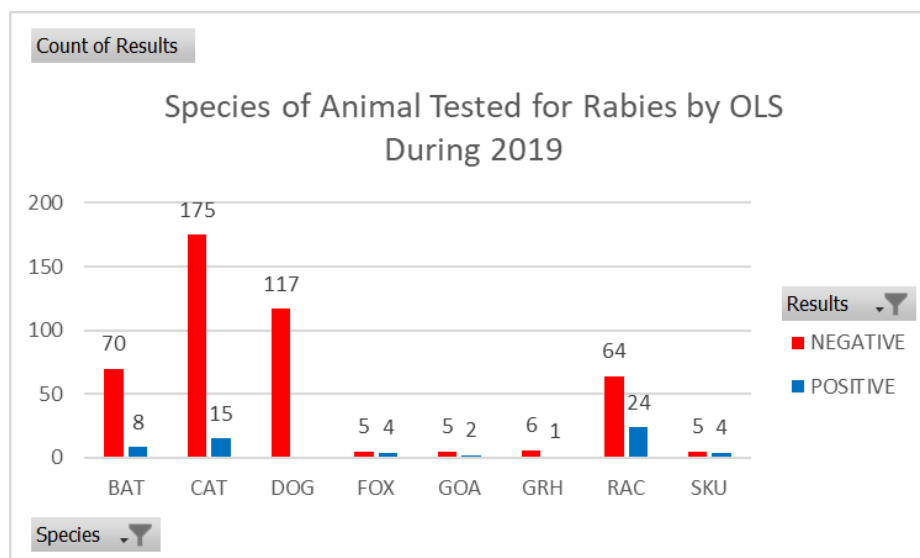
### ***Data Collection***

A specimen submission form, submitted with the specimen to OLS, was utilized to collect the following data: Species, location (county, address, geographic coordinates), date of collection, specimen submitter (e.g., veterinarian, county official) and the reason for submission (e.g., human exposure, pet/domestic animal exposure). Data on species and location was collected for specimens tested by the USDA and sent to the West Virginia Department of Health and Human Resources, Bureau for Public Health, Office of Epidemiology and Prevention Services, Division of Infectious Disease Epidemiology (DIDE).

## **RESULTS**

During 2019, 567 specimens were tested for rabies by OLS. Of these, 58 (10.2%) were positive. Wild animals including raccoons, bats, foxes and skunks accounted for 70.7% of all positive animals (Figure 3); additional positive animal species included cats and goats. Other animal specimens submitted for testing included cows, horses, dogs, rabbits, squirrels, goats and groundhogs.

The USDA tested 899 specimens for surveillance purposes in 2019. Of these, 26 (2.9%) were positive raccoons collected in the Eastern or Active Surveillance Regions. Raccoons accounted for the majority (82.5%) of specimens tested by the USDA; other animals tested included cats, coyotes, foxes, woodchucks, skunks, and opossums, all of which were negative.

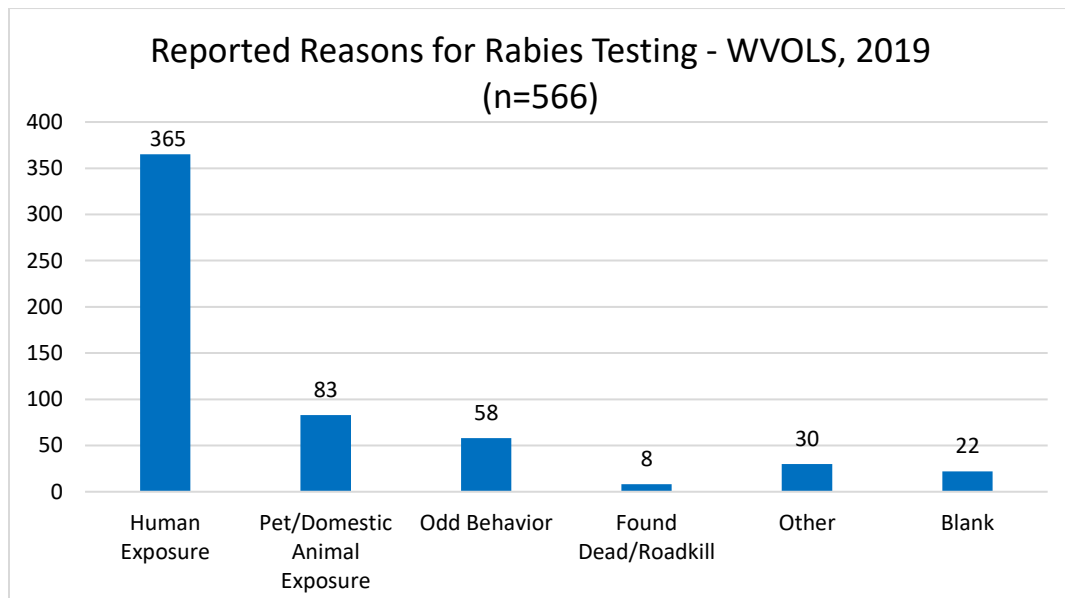


**Figure 3.** Species of animals tested for rabies by OLS during 2019.

In 2019, rabies positive animals were submitted from 23 counties (41.8%). One positive animal, a bat found in Mason County, was submitted from the Western Surveillance Region. Ten (11.9%) of the positive specimens were found in the Active Surveillance Region and these included two specimens

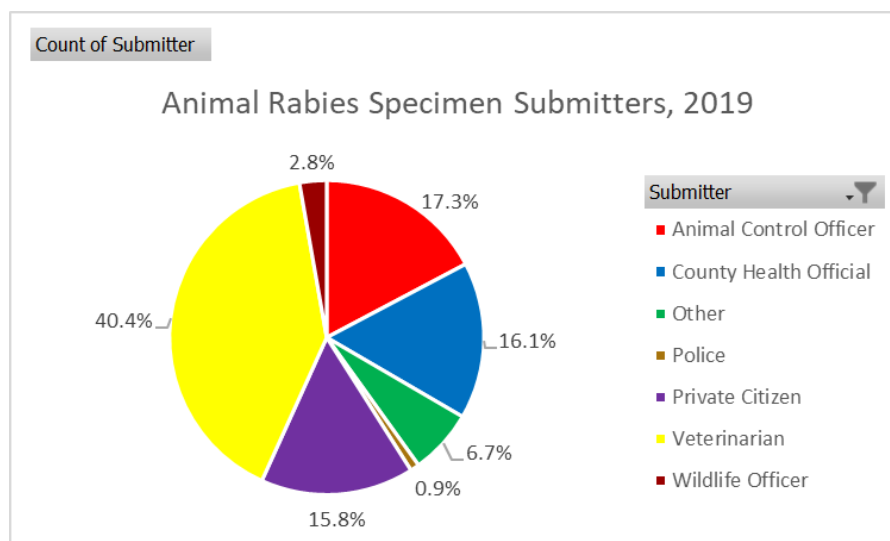
from Ohio County (raccoon and groundhog), one specimen from Kanawha County (bat), one specimen from Hancock County (raccoon), one specimen from Nicholas County (bat), one specimen from Ritchie County (bat), two specimens from Wood County (bats), one specimen from Wyoming County (bat) and one specimen from Marshall County (raccoon). The remaining 73 (86.9%) rabies positive animals were reported from the Eastern Surveillance Region. A large portion (21, or 25%) of the positive species from 2019 were found in Monongalia County alone.

The majority (n=365, 64.5%) of specimens were sent to OLS for testing as a result of human exposure to a potentially rabid animal (Figure 4). Pet and other domestic animal exposure were the next most frequently (n=72, 14.7%) reported reasons for specimen submission followed by an animal exhibiting odd behavior (n=58, 10.2%).



**Figure 4.** Reported reasons for rabies testing during 2019.

Veterinarians submitted the greatest percentage (40.4%) of specimens followed by animal control officers (17.3%), county health officials (16.1%) and private citizens (15.8%) (Figure 5).



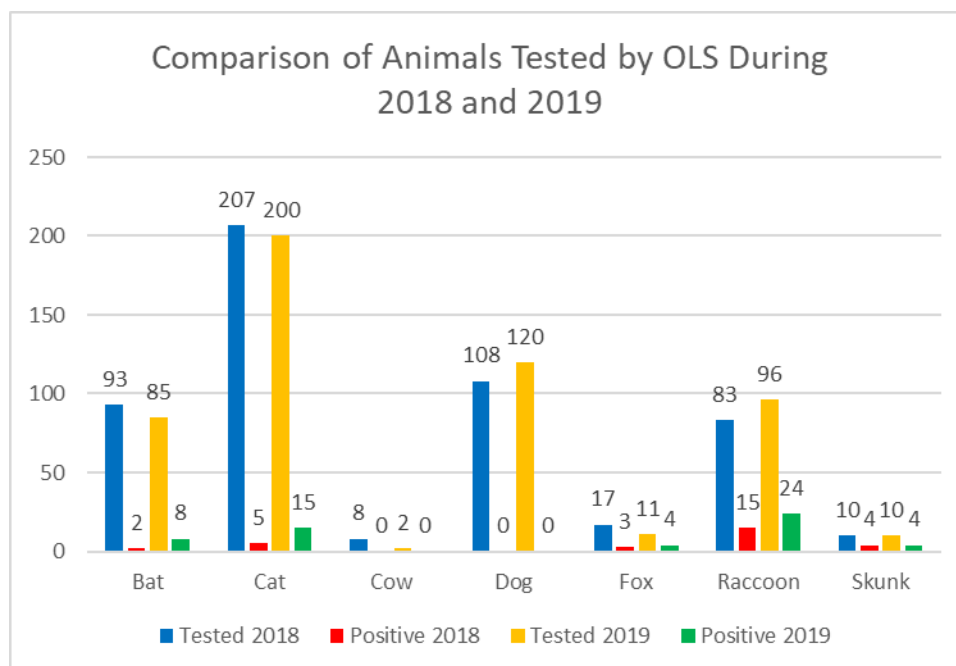
**Figure 5.** Percentage of animal rabies specimens by submitters during 2019.

## DISCUSSION

Cases of rabies are reported each year in West Virginia, with the majority of those coming from the Eastern Surveillance Region. In 2019, most positive rabies cases came from wild animal specimens (80%). Although more than half (56.9%) of animals tested by OLS were dogs or cats, these specimens accounted for only 15 (17.9%) of the rabies cases. Domestic animals, such as dogs or cats, that are not up to date on their rabies vaccinations or have never been vaccinated, are considered for rabies testing.

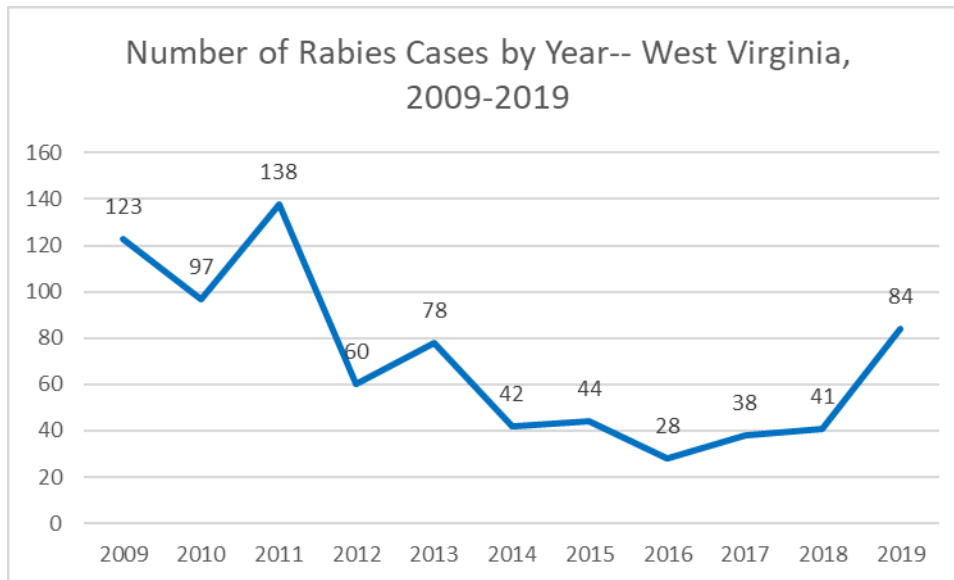
Specimens are sent in for rabies testing by many different submitters for many reasons. Veterinarians, county health officials, animal control officers, and private citizens comprise most of the specimen submitters. The most common reasons for sending specimens for testing include human exposure, pet/domestic animal exposure, and odd animal behavior. All specimens are tested using the DFA test prescribed by the Centers for Disease Control and Prevention for positive identification of the virus.

In 2019, the number of specimens tested by OLS were nearly identical to 2018 (566 in 2018, 562 in 2019) (Figure 6). Skunks and raccoons are still the animals with the highest number of positive cases. Dogs and cats are the two animals tested most often in both years by OLS and have a relatively small percentage of positive cases when compared to number tested (dogs: 0% in both years, cats: 2.4% in 2018, 7.5% in 2019). Vaccinating pets for rabies is the most effective way to reduce the number of domestic animals that are tested for rabies.



**Figure 6.** Number of animals tested and positive for rabies during 2018 and 2019.

Reported animal rabies cases declined rapidly after 2011 but have leveled off after 2014, only to spike again in 2019. (Figure 7). The success rate of the ORV Project in vaccinating wild animal populations may have contributed to this decrease and stabilization in the number of rabies cases. The goal is to eventually eradicate raccoon rabies in the state of West Virginia.



**Figure 7.** West Virginia rabies cases by year, 2009-2019.

A bite or scratch by any wild animal that could possibly carry the virus (e.g., bat, skunk, raccoon, fox, etc.) is considered evidence enough for treatment in humans, unless the animal can be found and tests negative. There has not been a human case of rabies reported in the state of West Virginia since 1994; continued surveillance of rabies in wild animal populations is crucial to preventing human cases of rabies in West Virginia. To prevent exposure to the rabies virus:

- Keep garbage in a secured trashcan.
- Feed pets indoors or remove food from bowls when feeding them outdoors.
- Teach children not to approach any wild animals or unfamiliar cats/dogs.
- Vaccinate pets against rabies.
- Do not keep wild animals, such as raccoons, as pets.
- Contact your local health department (LHD) if you see an animal acting strangely or if you have been bitten by a wild or unfamiliar domestic animal.

The DHHR's Zoonotic Disease Program in the Bureau for Public Health, Office of Epidemiology and Prevention Services, Division of Infectious Disease Epidemiology would like to thank the many public health partners who have contributed the data provided in this report. For additional information about rabies surveillance, visit:

- Division of Infectious Disease Epidemiology Animal Bites and Rabies Webpage: <https://oeps.wv.gov/rabies/pages/default.aspx>
- Centers for Disease Control and Prevention Rabies Webpage: [www.cdc.gov/rabies/index.html](http://www.cdc.gov/rabies/index.html)
- United States Department of Agriculture Rabies Webpage: [www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/programs/nrmp/ct\\_rabies](http://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/programs/nrmp/ct_rabies)
- West Virginia Office of Laboratory Services Webpage: <https://dhhr.wv.gov/labs/Pages/Rabies.aspx>