

2015 West Virginia Rabies Surveillance Report

INTRODUCTION

Rabies is a serious viral infection that is almost 100% fatal to humans. The virus is usually passed to humans through the bite of a rabid animal but can also be spread if the saliva of an infected animal gets into a fresh scratch, break in the skin, or contact with mucous membranes.

Different variants (types) of rabies virus are found in the environment. Raccoon rabies variant is found in the eastern United States and in West Virginia; skunk and fox strains are the variants found in the middle and western part of the country. Most cases of rabies in West Virginia occur in wild animals such as raccoons and skunks, though, many other mammalian species have been reported as being rabid. In order to prevent the spread of rabies to other animals and human, animal bites and into potential rabies exposures (e.g. scratches) are reportable to the local health department within 24 hours in accordance with West Virginia state law.

Counties in West Virginia are divided into three surveillance regions: Western Surveillance Region, the Eastern Surveillance Region, and the Active Surveillance Region (Figure 1). The Eastern Surveillance Region is important because West Virginia has historically reported animals that were positive for the raccoon rabies variant in these counties. Counties in the Active Surveillance Region serves as a buffer zone between the Eastern and Western Surveillance Regions; the hope is that the number of animals with raccoon rabies variant in this region will reach zero, thus preventing western expansion of raccoon rabies variant. Counties in the Western Surveillance have never reported raccoon rabies variant. Bat rabies variant is prevalent throughout West Virginia and the United States.

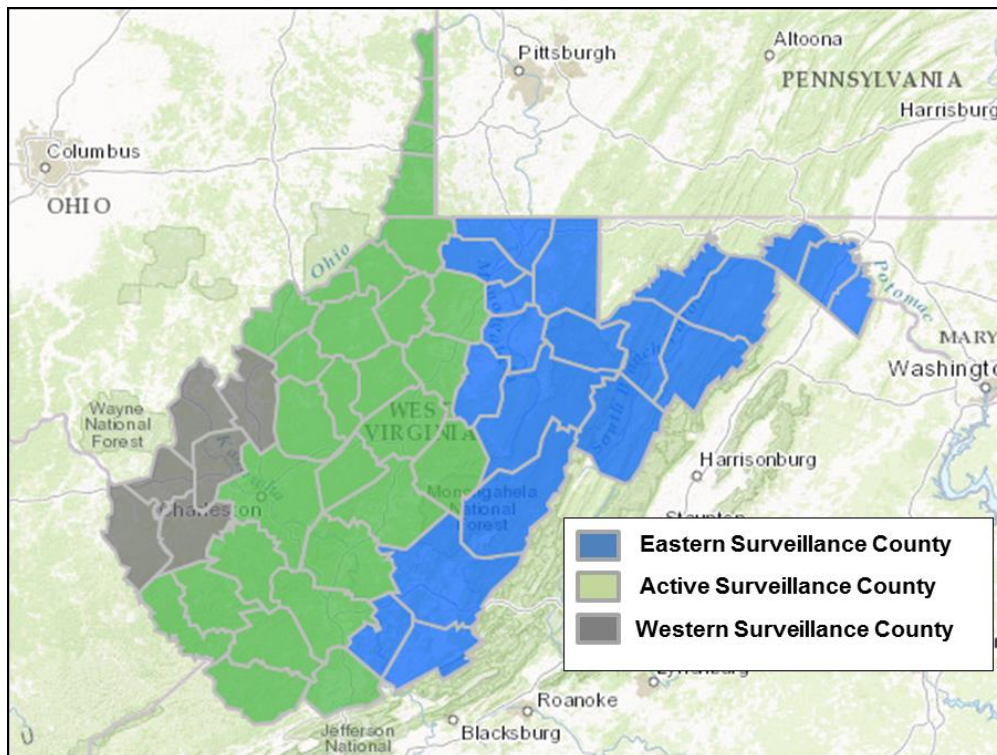


Figure 1. Rabies surveillance regions in West Virginia. West Virginia is divided into Eastern, Active and Western Surveillance Regions.

Because rabies is a viral infection of the central nervous system, the brain of a suspected rabid animal is what is tested for rabies. Brain specimens of suspected rabid animals are routed through local health departments to the West Virginia Office of Laboratory Services (WVOLS) for testing. The

United States Department of Agriculture Wildlife Services actively looks for rabid animals (raccoons and skunks) in West Virginia and conducts their own testing of raccoons and skunks.

In order to monitor rabies activity in West Virginia, data is collected and analyzed each year. This report details animal rabies surveillance activities in West Virginia during 2015.

METHODS

Specimen Submission

Whole specimens from smaller animals (e.g. rodents and bats) and heads from larger animals (e.g. cats, dogs, raccoons, skunks livestock) suspected rabid animals were double-bagged and shipped on frozen cold packs to WVOLS.

Testing

The Rabies Unit in WVOLS uses the direct fluorescent antibody (DFA) test to detect the rabies virus in animal (mammal) brain tissue. DFA is the only diagnostic method recommended by CDC for routine testing of animal tissue. DFA binds to rabies proteins (antigens) creating an antibody-antigen complex. Specimens were viewed under a microscope fitted with a special filter that detects fluorescence of the antibody-antigen complex in rabies-positive tissue.

Data Collection

Data related to the location (address, county, geographic coordinates), date of collection, species, submitter, reason for testing and type of exposure (human/pet, bite/scratch) were collected on a specimen submission form and were submitted to WVOLS with each suspected rabid animal brain specimen. Data were collected and stored in an Excel database for analysis. Maps were generated using ArcGIS Maps for Office.

RESULTS

In 2015, 550 animal brain specimens were tested for rabies of which 44 (8.0%) were positive for rabies (Figure 1). Raccoons, skunks, and foxes (n=36) accounted for 81.8% of positive animals. One cat was not suitable for testing. Six additional brain specimens from USDA tested positive for rabies (5 raccoons and one skunk) (data not shown).

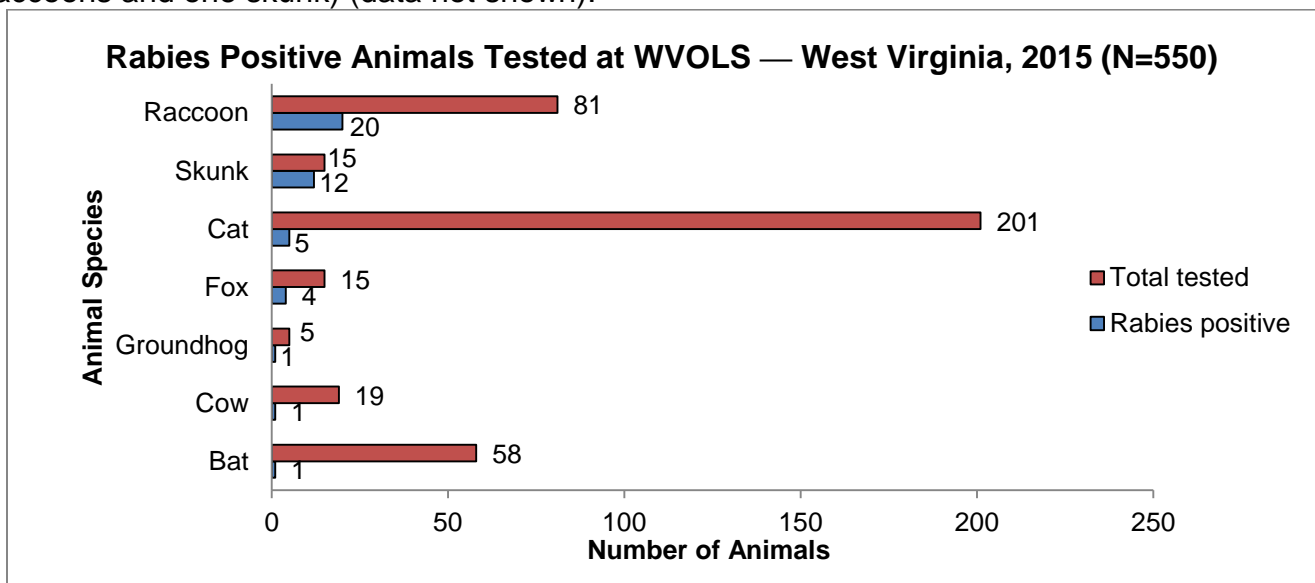


Figure 2. Rabies positive animals. Raccoons and skunks accounted for the most number of rabies positive animals.

Thirteen (23.6%) of West Virginia's 55 counties reported at least one rabies-positive animal (Figure 2). No animals tested positive for rabies from the Western Region, while 42 (95.5%) animals tested positive from the Eastern Region and 2 (4.5%) animals tested positive from the Active Surveillance Region. Mineral County (n=9), Berkeley County (n=7), and Grant County (n=7) reported the most number of rabies positive animals.

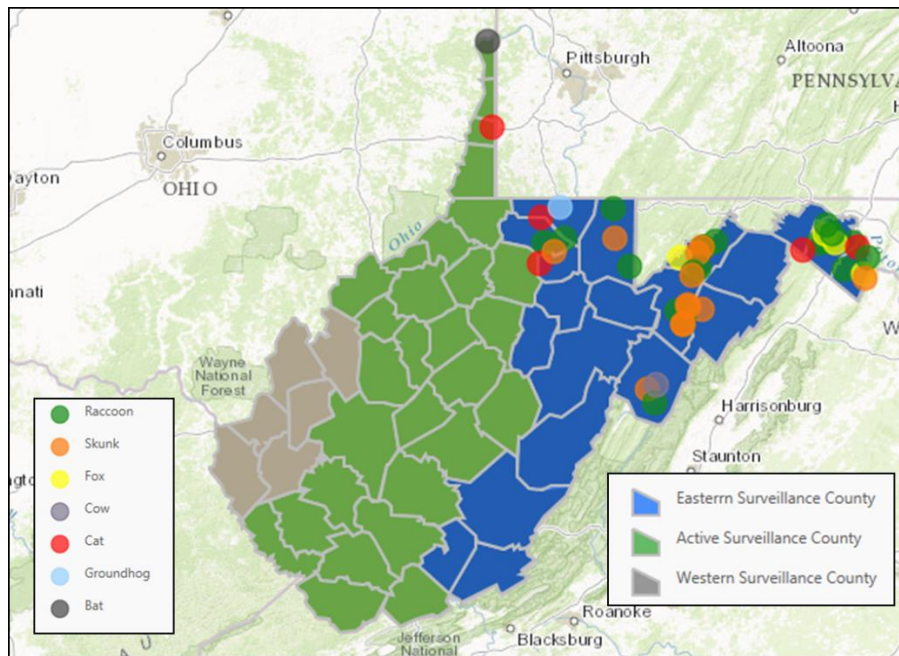


Figure 3. Rabies positive animals by species and county (2015). Most rabies-positive animals came from the Eastern Surveillance Region.

Of the 550 specimens tested, 480 (87.27%) were due to some type of human or domestic animal exposure (i.e. bite, scratch, mucus membrane contact, etc.) (Figure 3).

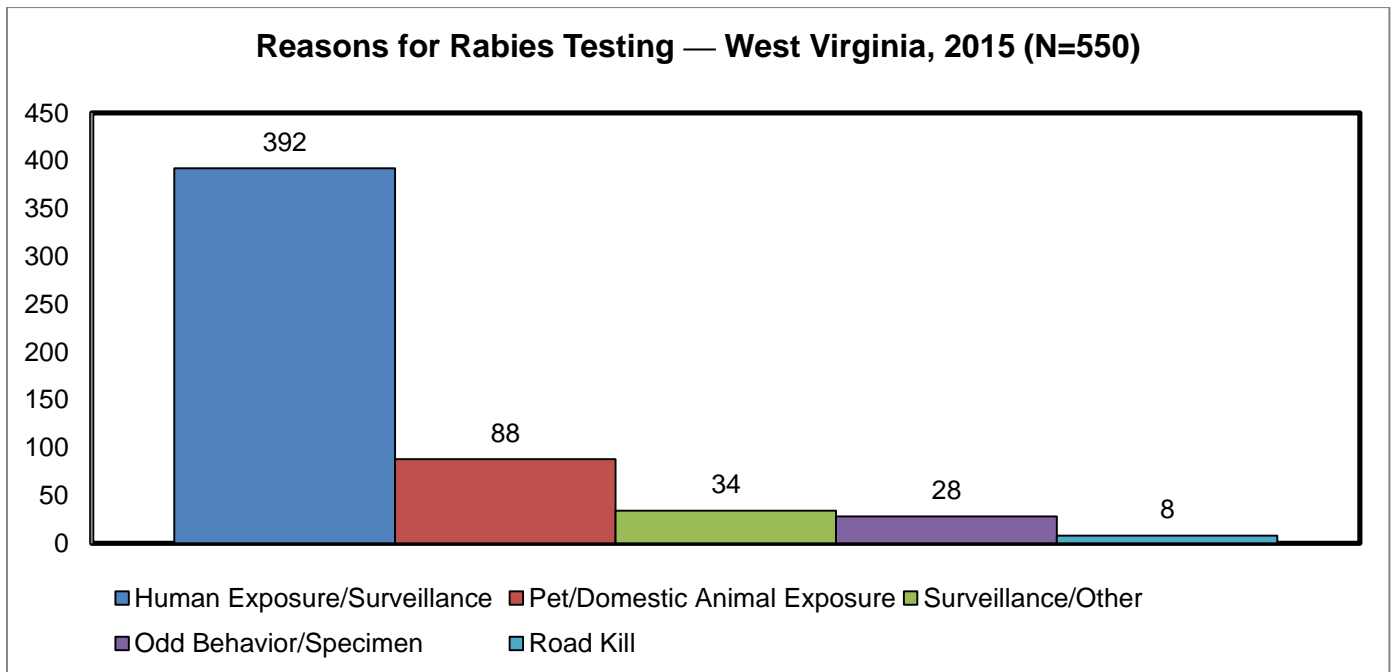


Figure 4. Reported reasons for animal rabies testing. The majority of specimens (71.2%) tested were for human exposure or for surveillance purposes.

Specimens were submitted by various sources (Figure 5). Veterinarian offices accounted for the majority of specimen submissions (39%) followed by animal control officers, public citizens, and county health departments.

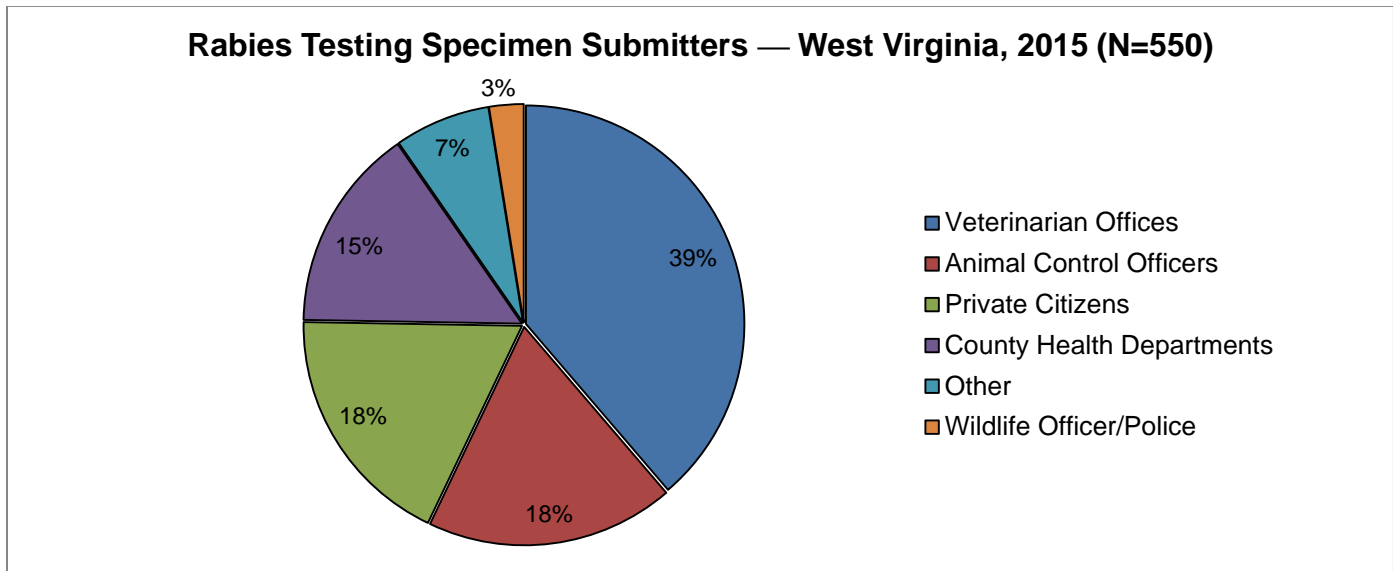


Figure 5. Submitters of animals for rabies testing. Most specimens were submitted by veterinary offices.

DISCUSSION

Domestic cats and dogs accounted for 330 (60%) of the 550 specimens submitted for testing. Because rabies testing is done on brain specimens, all specimens come from dead animals. Only 5 (1.5%) of domestic pets (all cats) tested were positive for rabies. In many instances, domestic pets are euthanized prior to testing, particularly when they are not current on rabies vaccinations or have not been previously vaccinated and encounter a suspected rabid animal. If pets were previously vaccinated, a less strict 45-day observation period is recommended to see if the animal develops signs of rabies. Domestic pets (cats, dogs, and ferrets) are required by West Virginia law to be vaccinated against rabies. Low-cost vaccination campaigns in areas where raccoon variant rabies may greatly reduce the number of cats and dogs that are euthanized each year for rabies testing.

While the majority of animals that are tested for rabies are domestic pets, the majority of animals that tested positive for rabies were wild animals. Skunks were the only species where the majority of animals tested were positive (80.0%, 12/15) in 2015, followed by foxes (26.7%, 4/15) and raccoons (24.7%, 20/81). While only one bat tested positive for rabies, testing of bats is strongly recommended in instances where a bat is found in the home (i.e. in a child's room). A single cow tested positive for rabies, consistent with low numbers of livestock testing positive each year in the state.

Specimen submitters, suspected rabid animals, and reasons for testing vary. This shows great collaboration between public health and various stakeholders to prevent rabies in humans and animals in West Virginia. Veterinarians in particular are critical partners in the state's rabies surveillance system.

The Oral Rabies Vaccine Project (ORV) is an annual cooperative initiative between USDA-APHIS-Wildlife Services, the West Virginia Department of Agriculture, and the West Virginia Bureau for Public Health. In 2015, over a million packets of rabies vaccine were dropped from planes in late-August to early September with the aim of vaccinating raccoons and skunks. Vaccine drops occurred in a "bait zone" that covered counties in the Active Surveillance Region and the Eastern Surveillance

Appendix A. Animal Rabies Cases – West Virginia 2001- 2015.

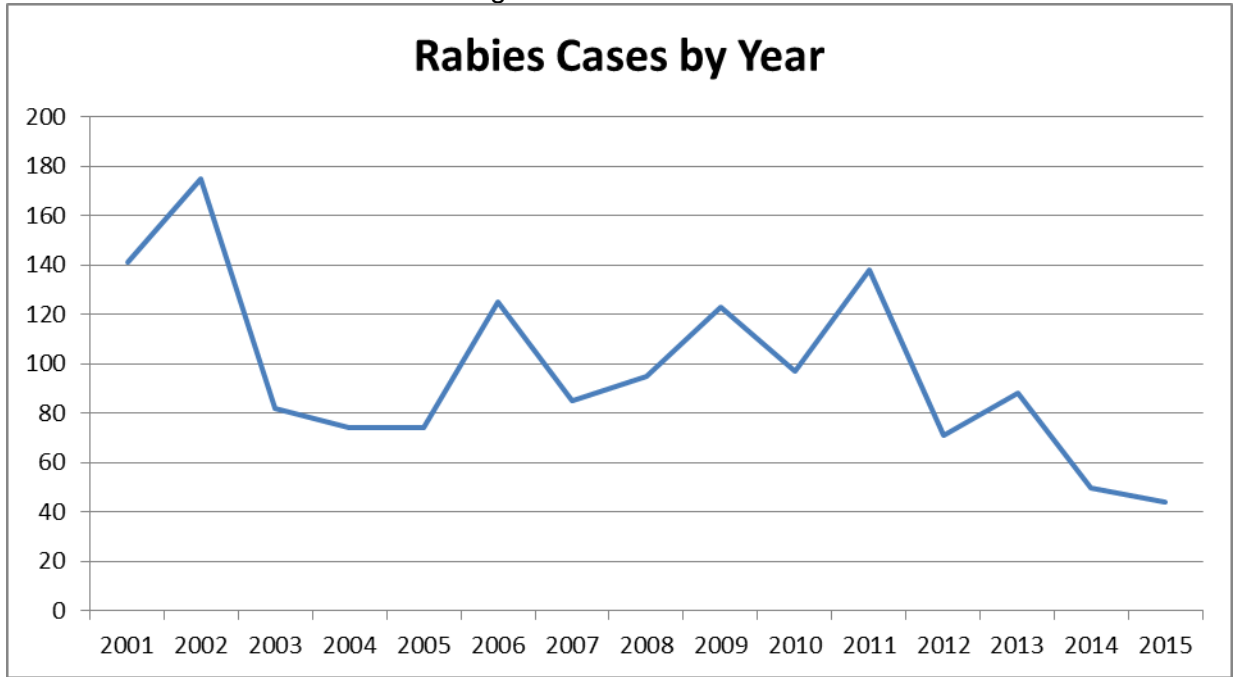


Figure 6. Rabies positive animals by species and county in West Virginia (2015). Most rabies-positive animals came from the Eastern Surveillance Region.

RESOURCES

- Division of Infectious Disease Epidemiology Animal Bites and Rabies Webpage:
<http://www.dhhr.wv.gov/oeps/disease/Zoonosis/Pages/default.aspx>
- Centers for Disease Control and Prevention Rabies Webpage:
<http://www.cdc.gov/rabies/index.html>
- United States Department of Agriculture
https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/programs/nrmp/ct_rabies

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