Rabies

Agent: Rabies virus, a rhabdovirus of the genus Lyssavirus
Mode of Transmission: Most commonly transmitted through the bite of an infected animal, but may be transmitted through any method by which virus-infected saliva or central nervous system tissue enters the body.
Signs/Symptoms: Vary widely, but in people, symptoms often include an initial headache, fever and apprehension which progresses to paralysis, spasms of the muscles used for swallowing, delirium and convulsions. Once symptoms appear, rabies is almost invariably fatal.
Prevention: Important prevention methods include vaccinating cats, dogs, and ferrets; using animal control to remove stray animals; and avoiding handling wildlife. A series of vaccines is recommended for people whose occupations increase their likelihood of being exposed to rabies (e.g., veterinarians and laboratorians working with rabies virus) and a vaccine series is also available for people who have been exposed.
Other Important Information: The main reservoir of rabies in the United States is wildlife. In most other countries, the main reservoir is dogs. Not everyone who meets the health department's definition of possible exposure to rabies is required to undergo the rabies vaccination series, also known as post-exposure prophylaxis (PEP). A person may receive PEP if he is considered exposed to rabies and the animal associated with the exposure is either not available or tests positive for rabies.

Human

There were no human rabies cases reported in Virginia in 2016. The last human rabies case reported in Virginia occurred in 2009 in an adult male who was infected with the Indian canine variant of the rabies virus. This person was thought to have been exposed during an encounter with a dog while traveling in India. The patient died as a result of this infection.

In 2016, 1,567 individuals were reported as having received rabies post-exposure prophylaxis in Virginia. This represents a statewide rate of 18.7 per 100,000 individuals receiving PEP and represents no change from 2015 when 1,568 individuals were reported as having received PEP. All health districts reported residents receiving rabies PEP. The Fairfax Health District had the highest number of individuals (n=231) receiving PEP, while the Three Rivers Health District reported the lowest number of individuals receiving PEP with two. The highest rate of PEP based on population was 56.3 per 100,000 reported from the Thomas Jefferson Health District, while the lowest rate (1.4 per 100,000) was reported from the Three Rivers Health District. By region, the northwest region had the highest rate of people receiving PEP at 29.7 per 100,000 and the eastern region had the lowest rate at 7.5 per 100,000. See Table 12 and the map insert for rabies PEP by individual health district.

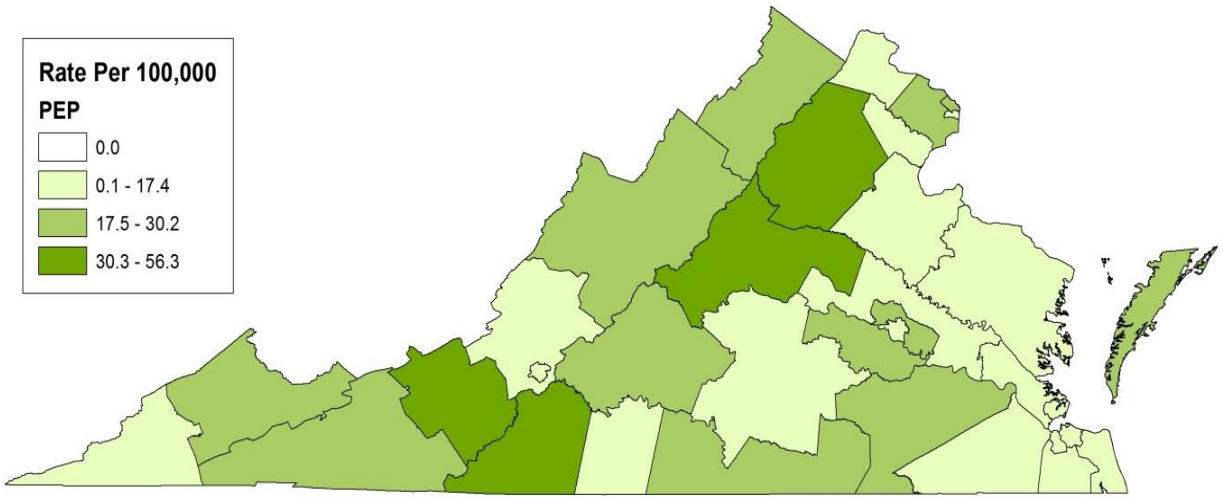
For health districts that recorded exposures by species among those receiving PEP, 37% of individuals received PEP due to exposure to a wildlife species, 32% received PEP due to exposure to a dog, and 26% received PEP due to exposure to a cat. Less than 3% of people received PEP due to livestock exposure. Twenty-four individuals received PEP due to an unknown or other animal exposure. Most potential human exposures to rabies that are reported to the health department each year are associated with dogs and cats.

Table 12: Number of People Receiving Rabies PEP by Health District, Virginia, 2016

Health District	Population	PEP	
		Number	Rate Per 100,000
Alexandria	153,511	24	15.6
Alleghany/Roanoke City*	279,631	16	5.7
Arlington	229,164	54	23.6
Central Shenandoah	294,270	81	27.5
Central Virginia	259,950	60	23.1
Chesapeake	235,429	8	3.4
Chesterfield	381,538	67	17.6
Chickahominy	152,912	9	5.9
Crater	156,374	31	19.8
Cumberland Plateau	108,681	37	17.9
Eastern Shore	45,128	10	22.2
Fairfax	1,180,139	231	19.6
Hampton	136,454	6	4.4
Henrico	325,155	82	25.2
Lenowisco	90,525	13	14.4
Lord Fairfax	230,845	50	21.7
Loudoun	375,629	64	17.0
Mount Rogers	191,532	50	26.1
New River	181,747	108	40.2
Norfolk	246,393	19	7.7
Peninsula	350,480	12	3.4
Piedmont	102,779	16	15.6
Pittsylvania/Danville	104,276	6	5.8
Portsmouth	96,201	4	4.2
Prince William	509,211	83	16.3
Rappahannock	356,095	31	8.7
Rappahannock/Rapidan	174,111	86	49.4
Richmond City	220,289	14	6.4
Southside	82,904	22	19.3
Thomas Jefferson	247,084	139	56.3
Three Rivers	140,902	2	1.4
Virginia Beach	452,745	64	14.1
West Piedmont	139,835	53	37.9
Western Tidewater	151,074	8	5.3
Total for 2016	**8,382,993**	**1,567**	**18.7**

* For surveillance purposes, rabies PEP data and population figures are combined for these two health districts.

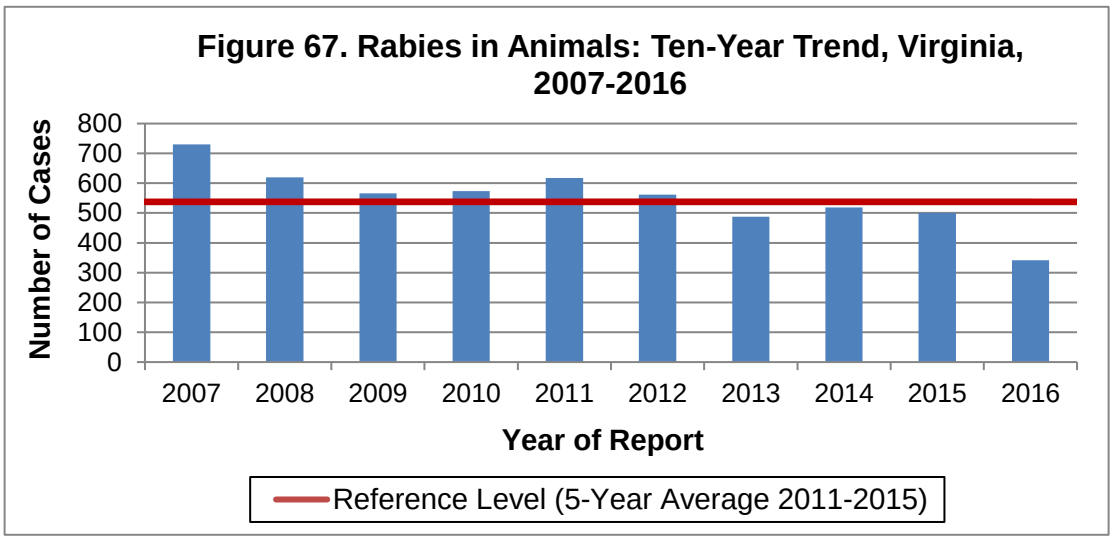
Table 12 Map Insert: Persons Receiving Rabies PEP per 100,000 by Health District, Virginia, 2016



For reference, a link to health districts and their corresponding localities can be found at http://www.vdh.virginia.gov/content/uploads/sites/10/2016/03/vamap.jpg

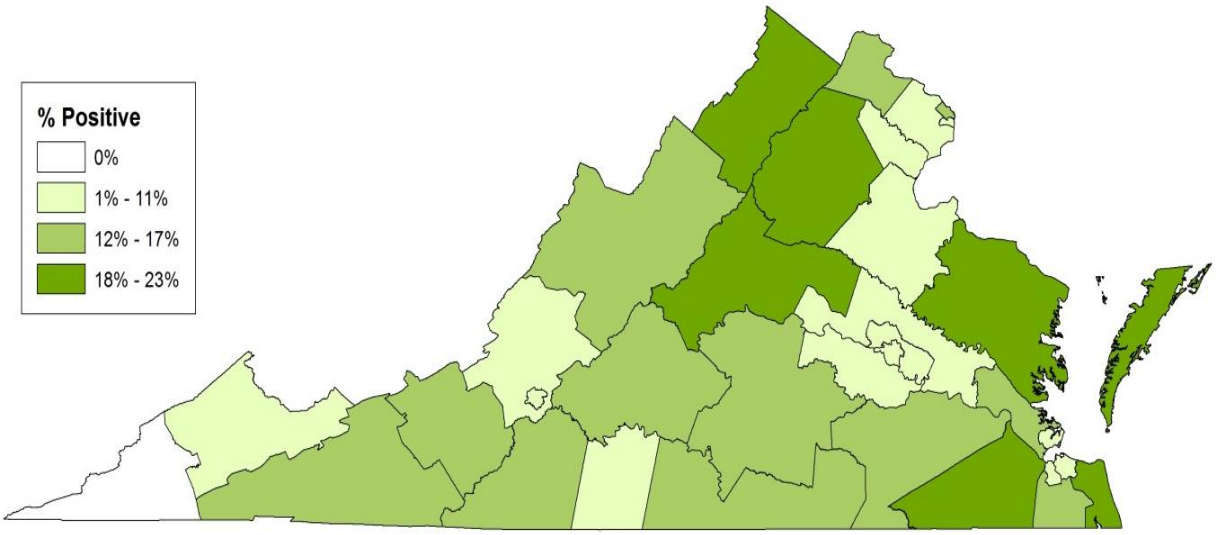
Animal

In 2016, health districts investigated over 19,000 incidents where either an animal potentially exposed a person to rabies or the animal itself was potentially exposed to rabies. Over 62% of these incidents involved dogs. Cats accounted for almost 25% of all incidents and wildlife accounted for almost 11% of incidents. Among all the incidents investigated, only 3,075 animals were submitted for rabies testing from Virginia. Out-of-state submissions included one dog from Connecticut and one cat from New York. Of the submitted animals, 348 (11%) were laboratory confirmed positive for rabies. The percent of animals testing positive for rabies in 2016 is slightly lower than the range of 13-16% of animals testing positive that has been observed over the last 10 years. The 348 animals testing positive for rabies in 2016 represents a 30% decrease from the 500 animals that tested positive for rabies in 2015, and is below the five-year average of 537 cases per year (Figure 67). An animal is submitted for testing when a person or another domestic animal meets the VDH definition of exposure to rabies. All animals are tested for rabies by the Division of Consolidated Laboratory Services or the Fairfax County Health Department Laboratory.



Based on laboratory submission data, eight localities submitted no animals for rabies testing. Of the localities that did submit animals for testing, Fairfax County submitted the highest number at 248 and had the highest number of positives with 20. By district, the largest number of rabid animals were reported from the Fairfax County Health District (33), followed by the Lord Fairfax Health District (30), and Rappahannock/Rapidan Health District (27). Although animals were submitted for testing, no rabid animals were identified from the Lenowisco Health District. At the regional level, the largest number of laboratory-confirmed rabid animals was reported from the northwest region (105), followed by the southwest region (71). The number of lab-confirmed rabid animals in the remaining regions ranged from 40 to 67. More detailed information about the number of animals testing positive by locality, health district, and region can be found in the section of this report entitled Number of Reported Cases and Rate per 100,000 Population for Selected Diseases by Locality, District and Region. The map below depicts data reflecting the percent of animals testing positive for rabies by health district.

Percent of Animals Testing Positive for Rabies by Health District, Virginia, 2016



Among all animal species, cats were the most frequently tested for rabies (803), and had the highest number of positives (27) among domestic animals (Table 13). Bats were the most commonly tested wildlife species, with 668 specimens submitted and 16 testing positive. Aside from a single bobcat testing positive (100%), skunks had the highest percentage of positive test results (61%), followed by raccoons (37%) and foxes (27%). Of the 348 animals testing positive for rabies in Virginia in 2016, raccoons accounted for almost half (46%) of all positive results, followed by skunks (26%), and foxes (8%). Cattle accounted for the largest number (12) of livestock testing positive for rabies, while donkeys accounted for the highest percentage (50%) of livestock testing positive. All small rodents submitted for testing were negative. Cats remain the domestic animal most commonly diagnosed with rabies, and raccoons remain the most common wildlife species diagnosed with rabies; these trends have been consistent for over 10 years.

Table 13. Animals Testing Positive for Rabies by Species, Virginia, 2016

Animal Species	Number of Animals Tested	Positive	
		Number	Percent
African Serval	1	0	0%
Alpaca	7	2	29%
Bat	668	16	2%
Beaver	1	0	0%
Bobcat	1	1	100%
Cat	803	27	3%
Chipmunk	4	0	0%
Cow	80	12	15%
Coyote	5	2	40%
Deer	5	0	0%
Dog	465	4	<1%
Donkey	2	1	50%
Fox	101	27	27%
Goat	36	2	6%
Groundhog	85	2	2%
Horse	17	0	0%
Llama	1	0	0%
Mink	1	0	0%
Mole	1	0	0%
Mouse	10	0	0%
Muskrat	2	0	0%
Opossum	128	0	0%
Otter	2	0	0%
Pig	4	0	0%
Rabbit	6	0	0%

Table 13. Animals Testing Positive for Rabies by Species, Virginia, 2016 (cont.)

Animal Species	Number of Animals Tested	Positive	
		Number	Percent
Raccoon	441	161	37%
Rat	2	0	0%
Rodent	1	0	0%
Sheep	5	0	0%
Skunk	148	91	61%
Squirrel	39	0	0%
Vole	3	0	0%
Total for 2016	**3075**	**348**	**11%**

The largest number of animals submitted for rabies testing occurred during the late spring and summer months, while the fewest number of animals were submitted for testing during the winter months (Figure 68). This seasonal pattern is likely a result of increased domestic animal and human interaction with wildlife during warmer months. No particularly strong seasonal pattern was observed in the number of animals testing positive for rabies, but June had the highest number of any month, with 51 animals testing positive, while November saw the fewest number (17) of animals testing positive.