



# **Summary of Reported Animal Bites Allegheny County, PA, 2015-2016**

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**Prepared by**

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## **Introduction**

Animal bites are a significant cause of injury and in rare circumstances can transmit the rabies virus via the saliva of an infected mammal. Rabies can be prevented after exposure occurs by administration of immune globulin and a series of vaccinations, but once symptoms develop it is almost always fatal. Worldwide dogs are the primary source of transmission, but in the United States bats and wild carnivores including raccoons, skunks, foxes are the primary hosts.<sup>1</sup> Only a small number of rabid dogs and cats are reported each year. In the US in 2015, 67 dogs, 244 cats, and 85 cattle tested positive; of those with known vaccination status, almost all were unvaccinated.<sup>2</sup>

From 2008-2017, 23 cases of human rabies were reported in the US.<sup>3</sup> In Pennsylvania, there has not been a human case since 1984.<sup>4</sup> The cost of rabies prevention, however, is substantial with an estimated 40,000-50,000 persons in the US receiving post-exposure prophylaxis each year.<sup>5</sup>

Health care providers are required to report animal bites affecting Allegheny County residents to the Allegheny County Health Department (ACHD). The Immunization Program at ACHD investigates all reports to ensure rabies post exposure prophylaxis (PEP) is provided when necessary.

## **Methods**

Health care providers report animal bites and scratches on a standard form. ACHD staff review the information provided on the form, contact the bite victim and pet owner to ensure that 1) rabies post exposure prophylaxis has been provided if indicated and 2) biting animals are quarantined or tested as per protocol. Data from the bite report forms are entered by ACHD staff into an Oracle database.

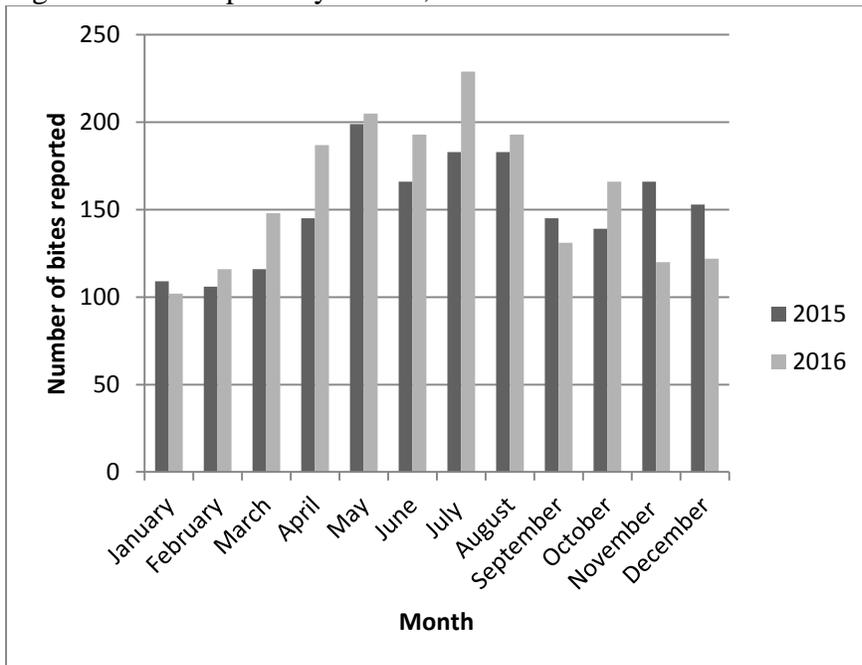
For this report, data on bites occurring in 2015 and 2016 were analyzed. If the date of bite was missing, bites with date of report in 2015 or 2016 were included (n=146). We use the term “bite” and “exposure” interchangeably to refer to all exposures (bites or scratches). Exposures from animals other than mammals were excluded from this analysis as they do not transmit rabies.

Rates per 100,000 population were calculated using 2015 US Census population estimates. Data on Allegheny County dog licenses by breed were obtained from the Allegheny County Treasurer’s Office for the year 2016.

## **Results**

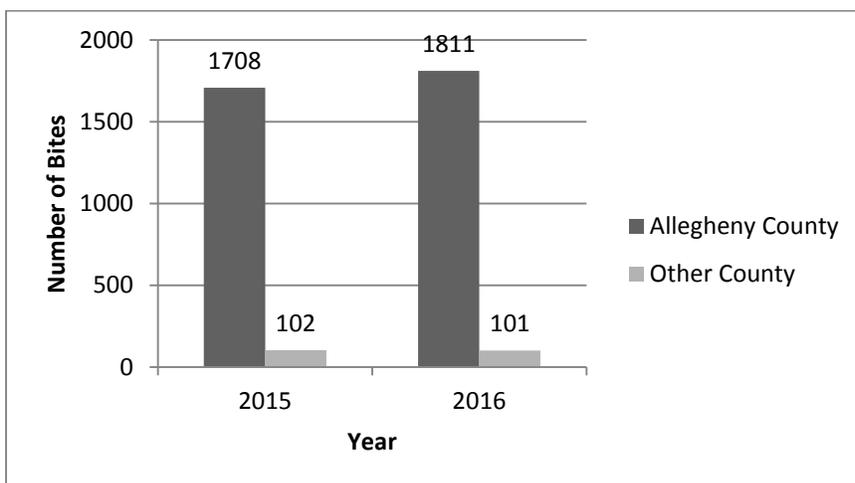
In 2015, 1,810 animal exposures (bites or scratches) were reported to ACHD, followed by 1,912 reported exposures in 2016. The number of bites reported was higher in the spring and summer months (Figure 1).

Figure 1: Bite Reports by Month, 2015-2016



Almost all bites (94.5%) reported to ACHD involved Allegheny County residents (Figure 2). The remaining reports pertained to bites occurring in Allegheny County or for biting animals whose owners lived in Allegheny County.

Figure 2: Number of bite reports by bite victim's county of residence



Most bites involved dogs (72.6%) or cats (22.5%) (Table 1). Bats and raccoons accounted for 1.6% and 0.6% of exposures, respectively. For 1.3% of reports, animal type was unknown or missing; either a person could not positively identify what type of animal bit them or no species information was provided.

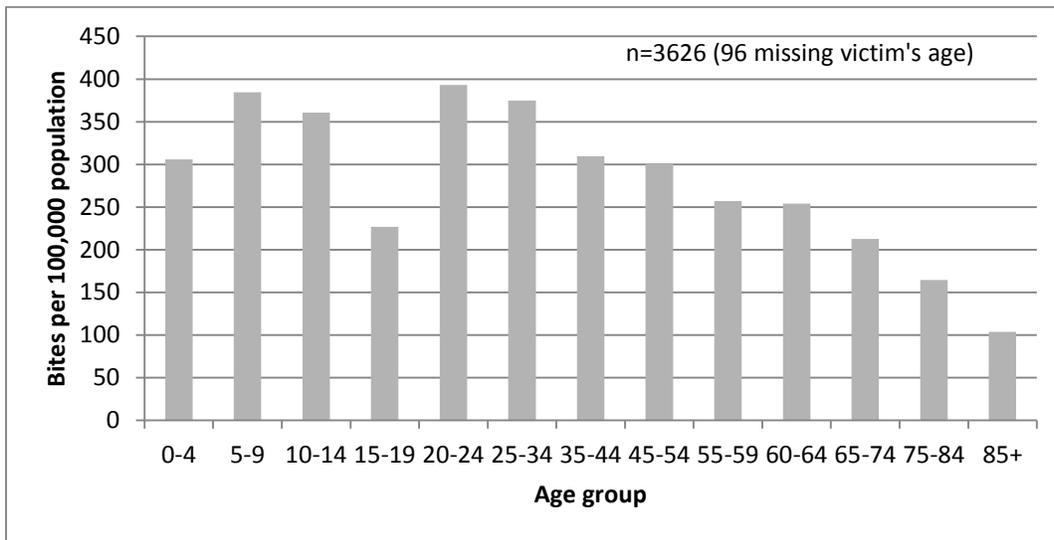
Follow-up investigations indicated that 179 persons were exposed to an animal that was later tested for rabies by ACHD (Table 1). Of these, 20 were exposed to an animal that tested positive for rabies. None of the exposures to rabid animals involved pets; the five exposures to rabies positive cats all involved stray/feral cats. Ten persons were exposed to rabid bats. No dogs tested positive for rabies in 2015-2016 in Allegheny County.

Table 1: Species and rabies test results of animals listed on bite reported to ACHD, 2015-2016

<b>Species</b>	<b>Number involved in exposures (%)</b>		<b>Number tested for rabies (%)</b>		<b>Number testing positive for rabies (%)</b>	
<b>Dog</b>	2701	(72.6)	87	(48.6)	0	(0.0)
<b>Cat (total)</b>	838	(22.5)	61	(34.1)	5	(25.0)
<b>Pet</b>	679	(18.2)	37	(20.7)	0	(0.0)
<b>Stray/Feral</b>	159	(4.3)	24	(13.4)	5	(25.0)
<b>Bat</b>	58	(1.6)	20	(11.2)	10	(50.0)
<b>Raccoon</b>	21	(0.6)	6	(3.4)	3	(15.0)
<b>Mouse</b>	10	(0.2)	0	(0.0)	0	(0.0)
<b>Ferret</b>	8	(0.2)	2	(1.2)	0	(0.0)
<b>Squirrel</b>	7	(0.2)	0	(0.0)	0	(0.0)
<b>Rat</b>	6	(0.2)	0	(0.0)	0	(0.0)
<b>Groundhog</b>	4	(0.1)	1	(0.6)	0	(0.0)
<b>Hamster</b>	3	(0.1)	0	(0.0)	0	(0.0)
<b>Monkey</b>	3	(0.1)	0	(0.0)	0	(0.0)
<b>Guinea Pig</b>	2	(0.1)	0	(0.0)	0	(0.0)
<b>Chipmunk</b>	2	(0.1)	0	(0.0)	0	(0.0)
<b>Rabbit</b>	2	(0.1)	0	(0.0)	0	(0.0)
<b>Coyote</b>	1	(<0.1)	1	(0.6)	1	(5.0)
<b>Fox</b>	1	(<0.1)	0	(0.0)	0	(0.0)
<b>Horse</b>	1	(<0.1)	0	(0.0)	0	(0.0)
<b>Opossum</b>	1	(<0.1)	0	(0.0)	0	(0.0)
<b>Skunk</b>	1	(<0.1)	1	(0.6)	1	(5.0)
<b>Unknown/Missing</b>	52	(1.3)	0	(0.0)	0	(0.0)
<b>Total</b>	3722	(100.0)	179	(100.0)	20	(100.0)

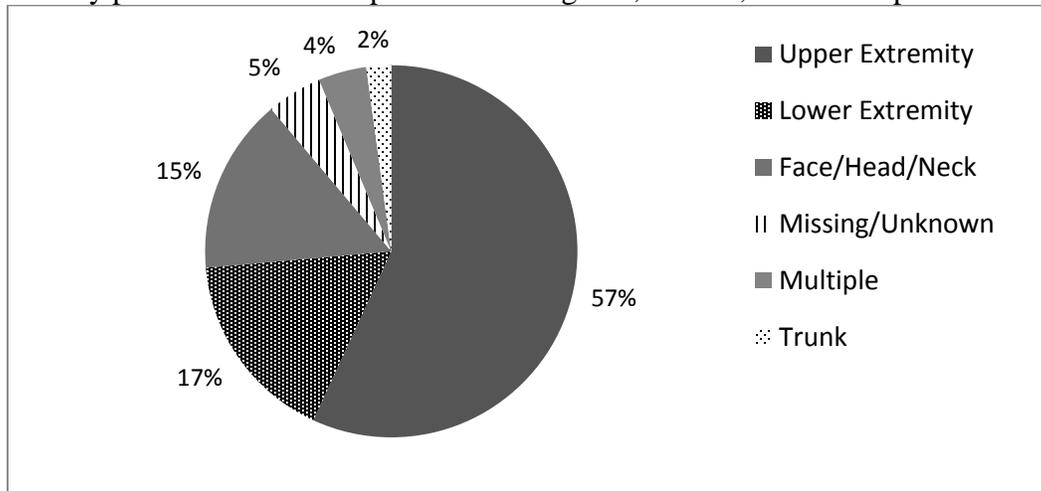
The age of bite victims ranged from 1 year to 100 years, with a median of 34 years. Bites per 100,000 population were highest for children 5 through 14 years and young adults aged 20 through 34 years (Figure 3). Of 3,599 bite victims with known sex, 58% were female and 42% were male.

Figure 3: Reported bites per 100,000 population by age group, Allegheny County, 2015-2016



The majority (57%) of bites/scratches were to upper extremities (arms and hands), followed by lower extremities (legs and feet) and face/head/neck (Figure 4). Injuries solely to the trunk (chest, back, or other abdomen injuries) accounted for only 2%. People who reported injuries to multiple body parts constituted 4% of all reports, and 5% of reports were missing information on body part(s). Information about the type of wound (bite, scratch, or deep wound) was reported for some incidents but not reported here because of incomplete/inaccurate data.

Figure 4: Body part where victim reported receiving bite, scratch, or other exposure



The circumstances that resulted in an animal bite are shown in Table 2. The largest number of incidents fall in the “other” category (34.8%), which is a catch-all for any type of event that does

not fall into the listed categories. The most common reported events involve interactions with pets.

Table 2: Reported causes of animal bites, Allegheny County, 2015-2016

Incident Type	N (%)
Playing with the animal	306 (8.2)
The animal got spooked	296 (8.0)
Breaking up a fight	293 (7.9)
Trying to pet the animal	202 (5.4)
Walking on the road	126 (3.4)
Performing a medical procedure	110 (3.0)
Trying to capture the animal	87 (2.3)
At a community area and animal came up and bit the victim	84 (2.3)
Entering the owner's house	84 (2.3)
Bathing/ Grooming the animal	68 (1.8)
Taking something from the animal	61 (1.6)
Trying to feed the animal	54 (1.5)
Touching a wound or painful spot on the animal	51 (1.4)
Walking into the owner's yard	36 (1.0)
Delivering the mail	35 (0.9)
Trying to put the animal in a crate	30 (0.8)
Giving medication to or cleaning a wound on the animal	27 (0.7)
Waking up in a room with a bat	26 (0.7)
Greeting a new animal	22 (0.6)
Checking the animal for a collar and tags	11 (0.3)
Bitten by a wild animal	10 (0.3)
Repairing/ Installing an item on the owner's property	9 (0.2)
Bitten by a bat	7 (0.2)
Yelling at or hitting the animal	7 (0.2)
Worker from phone / cable company that is on or near the owner's property	2 (0.1)
Other	1296 (34.8)
Missing	382 (10.3)

Of 3,722 persons exposed, 2,867 (77.0%) were given an antibiotic, 1,435 (38.6%) received a tetanus shot, and 192 (5.2%) received rabies post-exposure prophylaxis (Table 3). The percentage of exposed persons receiving antibiotics and receiving a tetanus shot was similar for dog bite victims and cat bite victims.

Table 3: Treatments received by bite victims, 2015-2016

Treatment type	All bites (N=3722) n (%)	Dog bites (N=2701) n (%)	Cat bites (N=838) n (%)
Antibiotic	2867 (77.0)	2141 (79.3)	667 (79.6)
Post-exposure prophylaxis (rabies vaccine)	192 (5.2)	75 (2.8)	45 (5.4)
Tetanus shot	1435 (38.6)	1053 (39.0)	320 (38.2)

Of 192 persons who received post-exposure prophylaxis (PEP), the majority (76.0%) received it because they were bitten by a domestic animal that could not be watched for survival or by an animal unavailable for rabies testing (Table 4). Nineteen (9.9%) were directly exposed to a rabies positive animal. The remaining 14.1% received PEP when they did not need to; the health care provider either suggested it when an animal could be observed or tested, or the victim requested it despite an animal being observable or tested. Of 20 persons exposed to animals that tested positive for rabies, 19 received post-exposure prophylaxis; one person refused treatment.

Table 4: Reasons for receiving post-exposure prophylaxis, 2015-2016

Reason (N=192)	n (%)
<b>Exposed to rabies positive animal</b>	19 (9.9)
<b>Exposed to animal that could not be observed or tested</b>	146 (76.0)
<b>Invalid Reason (received PEP unnecessarily)</b>	27 (14.1)

Of 2,701 dogs reported, 72.8% reportedly had at least one prior rabies vaccination and 70.5% were quarantined for 10 days following the bite as per protocol (Table 5). Of pet cats involved in bites, 74.4% reportedly had a least one prior vaccination and 74.4% were quarantined. Of feral cats, 17.6% had known prior vaccination and 30.2% were "quarantined" meaning that the stray cats regularly seen by the victim were "observed" for 10 days. Many of those marked no or unknown for quarantine status were for bites in which the victim could not or would not identify the owner, and thus, no quarantine notice could be given.

Table 5: Follow-up information in reported cat and dog bites, 2015-2016

	Dogs (N=2701) n (%)	Cats (n=838)	
		Pets (n=679) n (%)	Stray/Feral (n=159) n (%)
<b>Quarantined?</b>	1905 (70.5)	505 (74.4)	48 (30.2)
<b>Prior Rabies Vaccination?</b>	1967 (72.8)	505 (74.4)	28 (17.6)

Of dogs involved in reported bites, "mixed breed" were the most common (19.1%), followed by pit bulls (14.4%) and German shepherds (5.8%) (Table 6). Breed was missing or unknown for 22.5%. Three dog breeds were overrepresented in bite data relative to county breed registry statistics: pit bulls (2.5% of registered dogs and 14.4% of bites), German shepherds (2.9% of registered dogs and 5.8% of bites) and rottweilers (0.8% of registered dogs and 2.0% of bites) (Table 9). The percentage of other breeds involved in bites are in line with county registration

data or have too few bites for accurate information. All breeds that were responsible for at least 15 bites are displayed in Table 9.

Table 6: Breeds of dogs listed on bite reports, Allegheny County, 2015-2016

Breed Name	N (%)
<b>Mixed Breed</b>	516 (19.1)
<b>Pit Bull</b>	388 (14.4)
<b>German Shepherd</b>	157 (5.8)
<b>Labrador Retriever</b>	66 (2.4)
<b>Bulldog</b>	62 (2.3)
<b>Boxer</b>	54 (2.0)
<b>Rottweiler</b>	53 (2.0)
<b>Husky</b>	43 (1.6)
<b>Beagle</b>	40 (1.5)
<b>Golden Retriever</b>	35 (1.3)
<b>Jack Russell</b>	35 (1.3)
<b>Chihuahua</b>	34 (1.3)
<b>Mastiff</b>	27 (1.0)
<b>Dachshund</b>	26 (1.0)
<b>Australian Shepherd</b>	24 (0.9)
<b>Shih-Tzu</b>	24 (0.9)
<b>Great Dane</b>	23 (0.9)
<b>Labradoodle</b>	22 (0.8)
<b>Poodle</b>	19 (0.7)
<b>Yorkshire Terrier</b>	19 (0.7)
<b>Cocker Spaniel</b>	15 (0.6)
<b>Breeds with &lt;15 bites</b>	412 (15.3)
<b>Missing/unknown</b>	607 (22.5)

## Discussion

In summary, in 2016, 1,912 exposures to mammals were reported to ACHD, a 5.6% increase from 1,810 reports in 2015. Of the 3,722 reported bites in 2015-2016, 20 (0.5%) involved an animal that tested positive for rabies including 10 exposures to bats, five to cats, three to raccoons, one to a skunk, and one to a coyote. No rabid animals were pets. Wild animals are the main vector for human rabies, and avoiding close contact with wild animals remains the best way to prevent human rabies exposure.

The vast majority of bites in 2015-2016 were inflicted by dogs (72.6%) and cats (22.5%). A small percentage of dogs (3.3%) and pet cats (10.9%) involved in bites were not known to have received a rabies vaccination. Pennsylvania state law requires rabies vaccination of all dogs and cats by 3 months of age, but there is no enforcement. Dog owners in Allegheny County are

required to obtain a dog license but no proof of rabies vaccination is required. There are no licensing requirements for cats.

Post-exposure prophylaxis (PEP) for rabies was given to 192 (5.2%) bite victims. Of the victims that received PEP, 27 (14.1%) received it in cases where there was no immediate need for the vaccine due to the animal being available for observation and confirmed to be alive after the 10 day quarantine. Unnecessary usage of PEP is an area of concern given the vaccine's expense and requirement for multiple doses, which could put undue burden on people who have no need to be vaccinated. Individual bite reports suggest that unnecessary usage of PEP had two primary causes: doctors recommending it in cases where ACHD does not recommend it, and victims choosing to get vaccinated against ACHD recommendations.

CDC recommends that bite victims get a tetanus shot if it has been more than 5 years since the last tetanus shot and the bite is deep, otherwise only if it has been more than 10 years since the last shot. Many victims may not remember the date of their last tetanus shot. The Pennsylvania Statewide Immunization Information System (PA-SIIS) documents vaccination status for many individuals in Pennsylvania; therefore, health care providers should check PA-SIIS for the vaccination history of the victim.

Treatment with antibiotics usually depends on the severity of the wound and on the time since the bite occurred but should not be automatic. For many types of bite wounds, immediate irrigation with water or a dilute water povidone-iodine solution can decrease the risk of bacterial infection.

## **Recommendations**

1. The public should avoid contact with wild animals, refrain from adopting wild animals, and avoid contact with dead animals to reduce risk for rabies exposure.
2. Emergency department and urgent care center staff should be familiar with the protocol for rabies PEP. Providers should be aware that PEP is not immediately necessary if the animal is available for observation or testing.
3. All dog and cat owners should comply with the state's rabies vaccine regulations. In addition, pet owners should prevent their pets from wandering outdoors unsupervised so as to avoid contact with sick wildlife.
4. Health care providers should check PA-SIIS before giving a tetanus shot and follow the guidelines published by the Infectious Disease Society of America for prescribing antibiotics for animal bites.<sup>6</sup>

## References

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