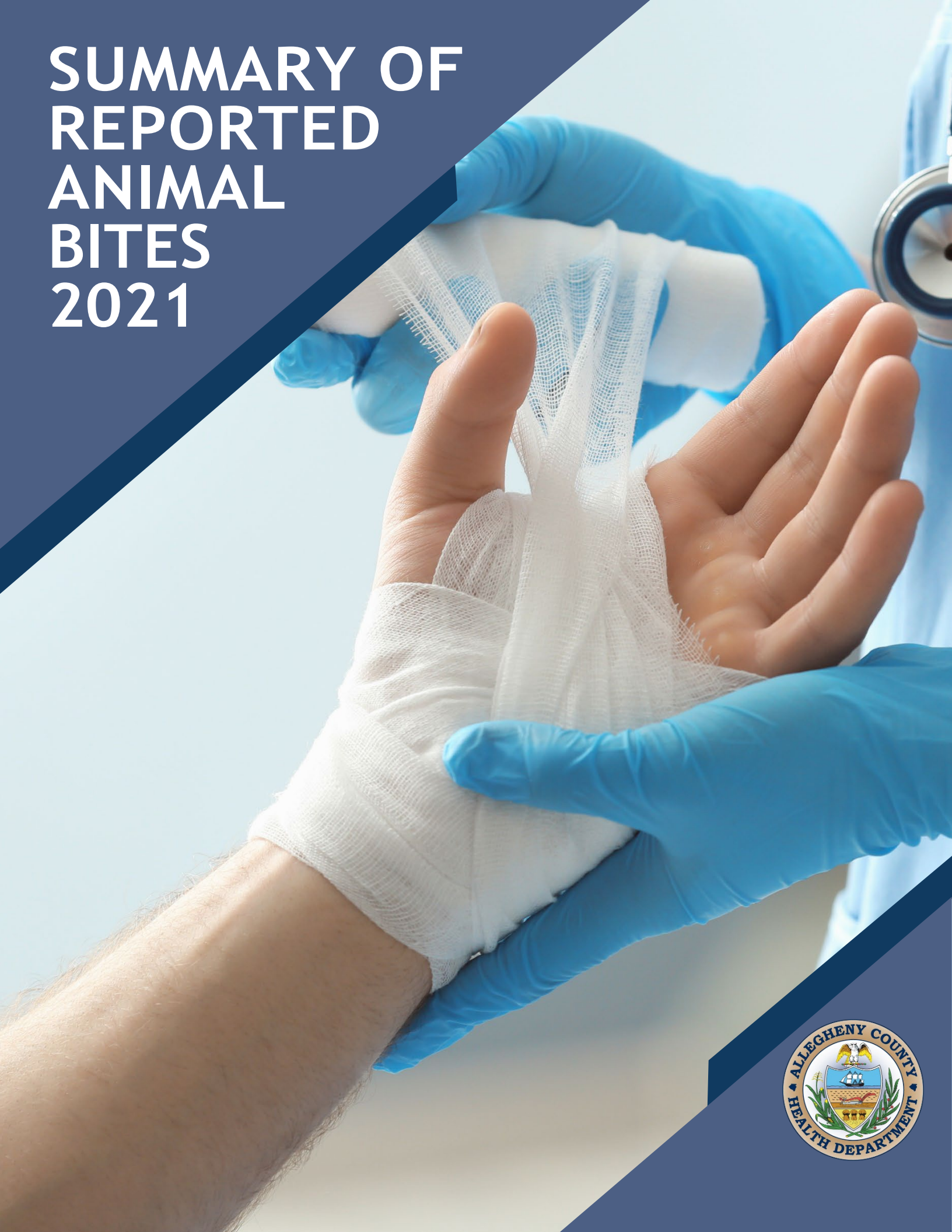


SUMMARY OF REPORTED ANIMAL BITES 2021



SUMMARY OF REPORTED ANIMAL BITES, 2021

Allegheny County, PA

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Allegheny County Health Department
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INTRODUCTION

Rabies, a viral pathogen that is lethal if left untreated, is transmitted to humans through the saliva of infected mammals.¹ Once symptoms appear, rabies is 99 percent fatal in humans. It poses a public health threat across the globe.¹ Annually, an estimated 59,000 human deaths are attributed to rabies, with dog bites responsible for up to 99 percent of human cases.² Children bear a significant burden of these deaths, as more than 40 percent of human rabies cases occur in persons under 15 years of age.²

In the United States, wild animals, such as bats and raccoons, comprise more than 90 percent of reported animal rabies cases. There are only one or two human cases per year in this country.³ In Pennsylvania, there have not been any cases of human rabies since 1984.¹ The low incidence of human rabies in the US is attributed to a robust public health surveillance and testing system, widespread availability of post-exposure prophylaxis (PEP) and rabies vaccination for pets.³

By Pennsylvania state law, all health care providers are required to report animal bites to the health department.⁴ If a domestic animal bites a human, the animal is placed on in-home quarantine, usually for a period of 10 days, and monitored for signs of rabies. If the animal is already deceased, the owner is asked to submit the animal for testing. If the animal cannot be quarantined or tested, or if it tests positive for rabies, the victim is directed to seek medical care to receive PEP. Post-exposure prophylaxis includes human rabies immune globulin (HRIG) given on day zero and human diploid cell vaccine (HDCV) given on days zero, three, seven, and 14 after being evaluated by a health care provider.⁵ Rabies is 100 percent preventable, if exposed individuals receive PEP before symptoms begin.³

In Allegheny County, health care providers must report bites[†] to the Allegheny County Health Department (ACHD). After notification, ACHD staff contact pet owners and bite victims to provide recommendations for quarantine of animals and treatment for bite victims. Deceased animals are submitted to the ACHD Public Health Laboratory for direct fluorescent antibody testing. This report describes the characteristics of persons bitten and treatment received for animal bites reported in 2021.

Methods

The ACHD receives bite reports from health care providers via a web-based form or a faxed report. Bite reports are also received from police officers, if they respond to animal bite incidents. Health Department staff enter data from faxed reports into the Oracle database. Staff then contact the bite victim and the pet owner, if applicable, to provide guidance and collect information missing from the original report.

[†] Note that the terms “bite” and “exposure” are used interchangeably throughout this report and refer to both animal bites and scratches.

Bite data from 2021 were exported from the Oracle database to a Microsoft Excel file. These data were then imported to SAS version 9.4 for cleaning and analysis. Duplicate observations, identified by name and bite date, were deleted. All bite reports for animals other than mammals were deleted, as rabies is exclusive to mammals.

Descriptive statistics were generated in SAS. Tables and graphs were created in Microsoft Excel and Microsoft Word. Population age group estimates were obtained from the US Census Bureau to calculate rates per 100,000 population. Population data from 2020 were used because estimates for 2021 were not available at the time of writing this report.

Data on the breeds of dogs licensed in Allegheny County were obtained from the Allegheny County Treasurer’s Office. Breeds involved in 2021 bite reports were compared to breeds licensed by the county. Microsoft Excel was used to calculate the chi-square statistics and p-values for breeds involved in bite reports. A p-value of 0.05 was used to establish statistical significance.

Data were extracted from prior annual reports to show the trends in animal bite incidents from 2013 through 2021.



RESULTS

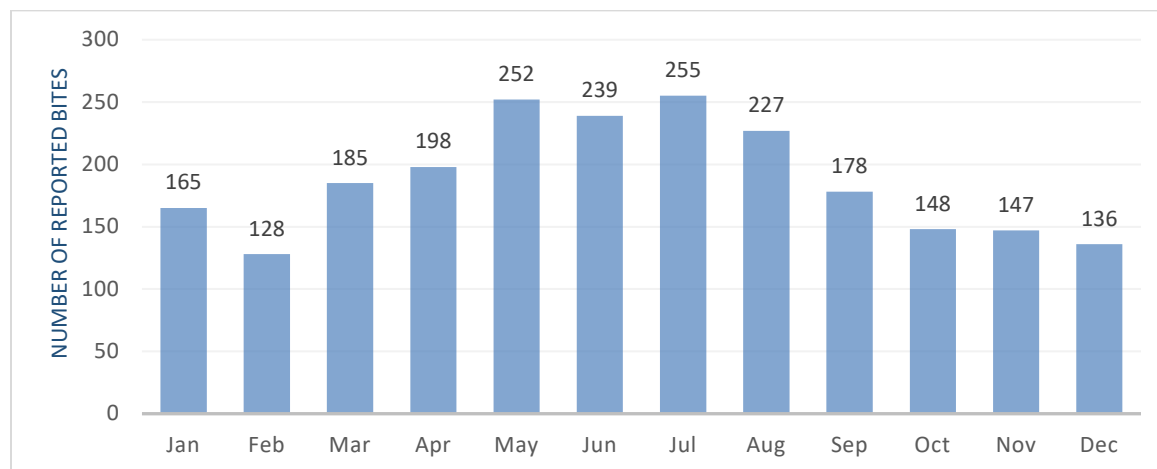
In 2021, ACHD received 2,258 unique animal bite reports. Most animal bites were attributed to dogs (75.7%) and cats (19.6%). Bats (0.8%), and raccoons (0.2%) were the most common wild animals listed in bite reports. The type of animal involved was not reported for 2 percent of the bites (**Table 1**).

Table 1. Reported bites by animal type, Allegheny County, 2021

Species	N = 2258	
	Frequency	Percent
Dog	1710	75.7%
Pet	1551	68.7%
Feral	21	0.9%
Stray	3	0.1%
Unknown/Missing	135	6.0%
Cat	442	19.6%
Pet	366	16.2%
Feral	18	0.8%
Stray	37	1.6%
Unknown/Missing	21	0.9%
Bat	19	0.8%
Rat	10	0.4%
Groundhog	5	0.2%
Raccoon	4	0.2%
Mouse	4	0.2%
Chipmunk	3	0.1%
Squirrel	3	0.1%
Rabbit	2	0.1%
Guinea Pig	1	<0.1%
Hamster	1	<0.1%
Other	9	0.4%
Missing	45	2.0%

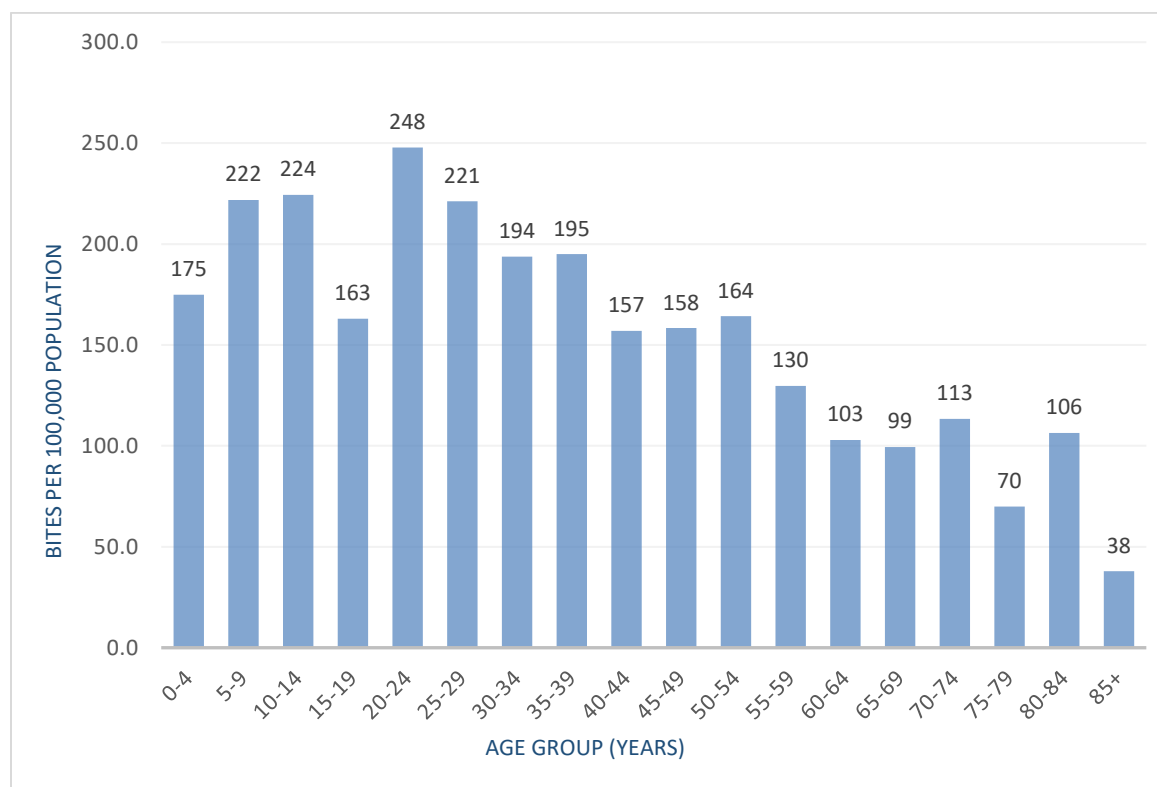
The number of reported bites peaked from May to August (**Figure 1**), possibly due to increased outdoor activities during summer.

Figure 1. Distribution of reported animal bites by month, Allegheny County, 2021



Bite victims’ ages ranged from less than one year to 96 years of age with a median of 32 years. The bite rate per 100,000 population was highest for individuals 20 to 24 years of age (**Figure 2**).

Figure 2. Reported bites per 100,000 population by age group of victims, Allegheny County, 2021



In 2021, 57.8 percent of bite victims were female and 42.2 percent were male. Male children had more bites than female children through ages 0-14 years (**Figure 3**). Females had more bites than males in all other age groups (15+ years).

Figure 3. Reported bite incidents by age group and sex of victim, Allegheny County, 2021

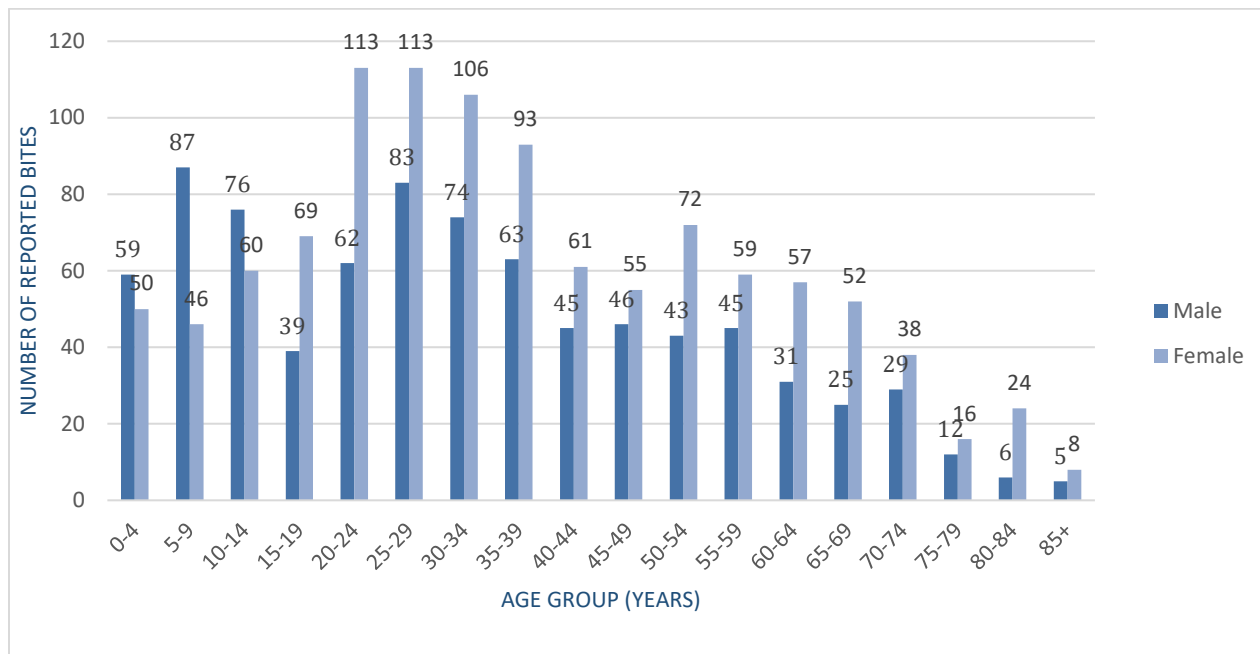


Table 2 illustrates the circumstances under which the bites occurred. It is worth noting that over half (61.8%) of the circumstances of the animal bites were not reported. Among those with reported incident type, the most common circumstances were playing with the animal (6.8%), animal got spooked (6.1%), and breaking up a fight (4.8%). Situations in which the bite was not provoked (“at a community area and animal came up and bit the victim” and “walking on the road”) accounted for 171 (7.6%) bites.

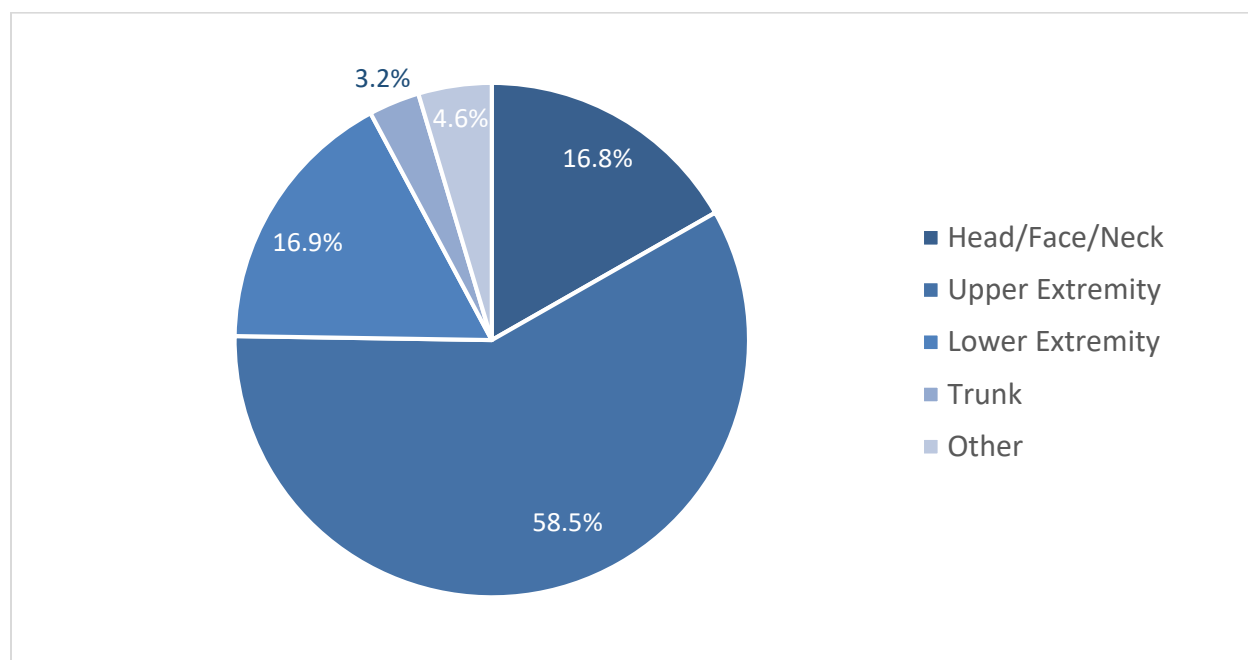
The data on circumstances are shown separately for dogs and cats (**Table 2**). Situations noted more frequently for cat bites than dog bites include trying to capture the animal, trying to put the animal in a crate, bathing or grooming the animal, and performing a medical procedure.

Table 2. Type of incident for reported bites, Allegheny County, 2021

BITE INCIDENT	All Bites N = 2258		Dog Bites N = 1710		Cat Bites N = 442	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Playing with the animal	154	6.8%	124	7.3%	28	6.3%
At a community area and animal came up and bit the victim	149	6.6%	128	7.5%	16	3.6%
The animal got spooked	138	6.1%	101	5.9%	33	7.5%
Breaking up a fight	109	4.8%	103	6.0%	3	0.7%
Other	101	4.5%	91	5.3%	8	1.8%
Trying to pet the animal	34	1.5%	26	1.5%	8	1.8%
Walking on the road	22	1.0%	22	1.3%	0	0.0%
Not Specified	1395	61.8%	1013	59.2%	299	67.6%
Circumstances with < 1% occurrence	156	6.9%	102	6.0%	47	10.6%

Most bites occurred on the upper extremities (58.5%), followed by the lower extremities (16.9%) and face/head/neck (16.8%). Only 1.7 percent of bites took place on the trunk area. For 98 (4.6%) reports, the bite sites were listed as “other,” and no other information was given. (Figure 4).

Figure 4. Location of exposure for bites reported, Allegheny County, 2021



Note: Upper extremity was defined as shoulder, arm, wrist, finger, and hand. Lower extremity was defined as leg, foot, hip, ankle, and toe. Face/head/neck was defined as face, head, neck, and ear. Trunk was defined as abdomen, chest, buttocks, and back. If a person was bitten in multiple locations, each bite site was included.

TREATMENT FOR BITES

Two-thirds (66.6%) of the bite victims received antibiotics for treatment, and 30.3 percent of the victims received a tetanus vaccine. Among the victims, 63 (2.8%) started rabies PEP, and 21 (0.9%) completed the PEP (**Table 3**).

Among victims bitten by dogs, 66.1% received antibiotics, 30.4 percent received a tetanus vaccine, 40 (2.3%) started rabies PEP, and 9 (0.5%) completed the PEP (**Table 3**).

Among victims bitten by cats, 74.0 percent were prescribed antibiotics, 30.1 percent received a tetanus vaccine, 11 (2.5%) started rabies PEP, and 4 (0.9%) completed the PEP (**Table 3**).

Among the 19 victims exposed to bats, none were prescribed antibiotics, two (10.5%) received a tetanus vaccine, 10 (52.6%) started rabies PEP, and 8 (42.1%) completed the PEP (**Table 3**).

Of the 21 bite victims who completed PEP, three completed the full course of PEP unnecessarily as rabies was ruled out by observation or testing of animals, and 17 completed the full course of PEP because the biting animal could not be observed or tested. One victim completed PEP because of exposure to a rabid bat.

Table 3. Type of treatment reported for animal bites, Allegheny County, 2021

Treatment	All Bites N= 2258		Dog N = 1710		Cat N = 442		Bat N = 19	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Wound Cleansed								
Yes	1461	64.7%	1146	67.0%	258	58.4%	2	10.5%
Tetanus								
Yes	685	30.3%	520	30.4%	133	30.1%	2	10.5%
Antibiotic								
Yes	1503	66.6%	1130	66.1%	327	74.0%	0	0.0%
Other Treatment								
Yes	86	3.8%	74	4.3%	9	2.0%	3	15.8%
PEP Started								
Yes	63	2.8%	40	2.3%	11	2.5%	10	52.6%
No	2194	97.2%	1670	97.7%	430	97.3%	9	47.4%
Missing	1	<0.1%	0	0.0%	1	0.2%	0	0.0%
PEP Completed								
Yes	21	0.9%	9	0.5%	4	0.9%	8	42.1%
No	2239	99.2%	1702	99.5%	439	99.3%	11	57.9%
Missing	1	<0.1%	0	0.0%	1	0.2%	0	0.0%

Of animals tested for rabies at the Public Health Laboratory, 15 from Allegheny County tested positive, 12 of them being bats. Four bats were reported to have human exposure; however, only one bite related to a rabid animal was captured in the 2021 animal report data. Three raccoons tested positive for rabies, but none had known human exposure.

Amoxicillin/clavulanate (Augmentin) was the most common antibiotic prescribed for animal bites (61.9%) (**Table 4**). The type of antibiotic prescribed was not specified in 295 (19.6%) bite reports.

Table 4. Type of antibiotic prescribed among bite victims receiving antibiotics, Allegheny County, 2021

Antibiotic for Treatment/Antibiotic Description	N=1503	
	Frequency	Percent
Amoxicillin/Clavulanic Acid	931	61.9%
Doxycycline	66	4.4%
Ampicillin-Sulbactam	42	2.8%
Amoxicillin	39	2.6%
Amoxicillin/Clavulanic Acid + Ampicillin-Sulbactam	24	1.6%
Doxycycline + Metronidazole	18	1.2%
Cephalexin	7	0.5%
Clindamycin + Doxycycline	7	0.5%
Sulfamethoxazole-Trimethoprim + Clindamycin	7	0.5%
Clindamycin	6	0.4%
Sulfamethoxazole-Trimethoprim + Metronidazole	6	0.4%
Antibiotics with <5 occurrences	55	3.7%
Unknown	295	19.6%

The dog breeds involved in bite reports are shown in Table 5. The most common breeds involved in dog bites were pit bull and German shepherds. Among 1,710 dog bites, 244 (14.3%) bites were attributed to a pit bull and 88 (5.1%) bites were attributed to German shepherds. For 42.5% of dog bites, the breed was not specified in the report. Some breeds were overrepresented in the data compared with county licensing statistics. Breeds that accounted for significantly higher percentages of bites compared with county license percentages are shown in bold font, and include pit bulls, German shepherds, bulldogs, huskies, and rottweilers.

Table 5. Dog breeds involved in bites and dog breeds licensed, Allegheny County, 2021

Dog Breed	N = 1710		Dog licensed in the county N = 74069		P-Value:
	Frequency	Percent	Frequency	Percent	
Akita	5	0.3%	86	0.1%	0.04
Australian Shepherd	26	1.5%	868	1.2%	0.19
Beagle	23	1.3%	1539	2.1%	0.04
Boston Terrier	9	0.5%	604	0.8%	0.19
Boxer	18	1.1%	1277	1.7%	0.04
Bulldog	51	3.0%	112	0.2%	< 0.01
Cane Corso	5	0.3%	195	0.3%	0.82
Chihuahua	18	1.1%	2080	2.8%	< 0.01
Chow Chow	5	0.3%	61	0.1%	< 0.01
Corgi	6	0.4%	366	0.5%	0.40
Dachshund	14	0.8%	1458	2.0%	< 0.01
Dalmatian	7	0.4%	121	0.2%	0.01
Doberman Pinscher	7	0.4%	310	0.4%	0.95
German Shepherd	88	5.1%	2258	3.0%	< 0.01
Golden Retriever	29	1.7%	2408	3.3%	< 0.01
Great Dane	10	0.6%	369	0.5%	0.62
Great Pyrenees	4	0.2%	209	0.3%	0.71
Hound	18	1.1%	1763	2.4%	< 0.01
Hungarian Vizsla	6	0.4%	192	0.3%	0.46
Husky	31	1.8%	725	1.0%	< 0.01
Jack Russell	8	0.5%	305	0.4%	0.72
Labradoodle	26	1.5%	623	0.8%	< 0.01
Labrador Retriever	26	1.5%	4306	5.8%	0.00
Mastiff	16	0.9%	151	0.2%	< 0.01
Pit Bull	244	14.3%	2344	3.2%	< 0.01
Poodle	8	0.5%	861	1.2%	0.01
Presa Canario	4	0.2%	15	< 0.1%	< 0.01
Pug	6	0.4%	682	0.9%	0.01
Rottweiler	31	1.8%	568	0.8%	< 0.01
Sheltie	5	0.3%	456	0.6%	0.09
Shih Tzu	9	0.5%	1763	2.4%	< 0.01
Springer Spaniel	6	0.4%	280	0.4%	0.86
Weimaraner	5	0.3%	195	0.3%	0.82
West Highland White Terrier	7	0.4%	392	0.5%	0.50
Yorkshire Terrier	11	0.6%	1461	2.0%	< 0.01
Breed with < 5 reported bites	69	4.0%			
Mixed Breed	122	7.1%			
Not Specified	727	42.5%			

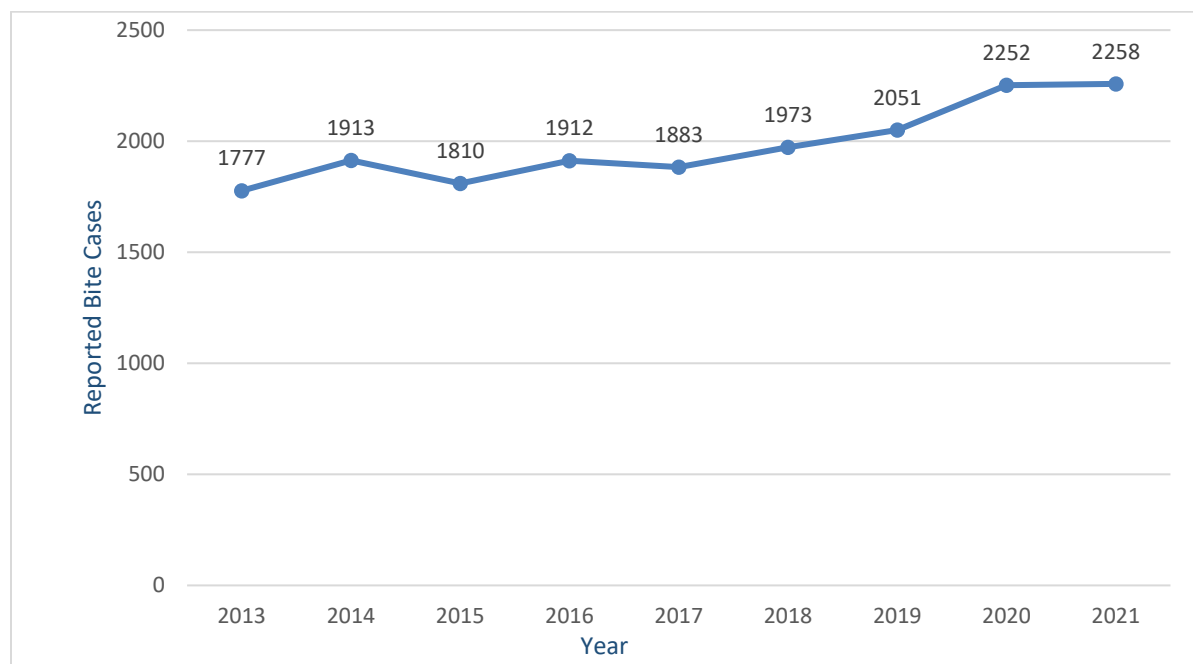
Note: Breeds highlighted in blue under the p-value column are significantly overrepresented in animal bite reports compared to county license data from 2021.

If two or more breeds were listed as a dog breed (e.g. pit bull + mastiff), breed was categorized as the first breed listed (pit bull). If a breed was listed as a single breed mix (e.g. pit bull mix), the breed was categorized as a single breed (pit bull).

TRENDS IN REPORTED BITES, 2013-2021

From 2013 to 2021, the annual number of reported animal bites increased by 27.1 percent, from 1,777 bites in 2013 to 2,258 bites in 2021 (**Figure 5**).

Figure 5. Reported bites by year, Allegheny County, 2013-2021



From 2017 to 2021, the number of reported dog bites increased steadily. The number of bites by cats, bats and raccoons remained relatively stable (**Table 6**).

Table 6. Number of exposures by select species, Allegheny County, 2017-2021

Year	Dog	Cat	Bat	Raccoon
2017	1330 (70.6%)	452 (24.0%)	25 (1.3%)	12 (0.6%)
2018	1477 (74.9%)	438 (22.2%)	14 (0.7%)	8 (0.4%)
2019	1480 (72.2%)	495(24.1%)	18 (0.9%)	12 (0.6%)
2020	1685 (74.8%)	433 (19.2%)	20 (0.9%)	11(0.5%)
2021	1710 (75.7%)	442 (19.6%)	19 (0.8%)	4 (0.2%)

From 2017 to 2021, there was an upward trend in the percentage of all reported bite victims treated with antibiotics. The percentage of persons with cat bites who were prescribed antibiotics increased in 2020 and 2021. The trend in the percentage of dog bites treated with antibiotic fluctuated over the five-year period (**Table 7**).

Table 7. Treatment of reported bites with antibiotics, Allegheny County, 2017-2021

Year	Bites treated with antibiotics (%)	Dog bites treated with antibiotics (%)	Cat bites treated with antibiotics (%)
2017	1118 (59.4)	868 (65.3)	294 (65.0)
2018	1218 (61.7)	917 (62.1)	283 (64.6)
2019	1274 (62.1)	920 (62.2)	326 (65.9)
2020	1548 (68.7)	1177 (69.9)	300 (69.3)
2021	1503 (66.6)	1130 (66.1)	327 (74.0)

From 2017 to 2021, there was a downward trend in the number of bite victims completing PEP. The percentage of all bite victims who completed rabies PEP decreased from 4.3 percent in 2020 to 0.8 percent in 2021 (Table 8).

Table 8. Bite victims completing rabies PEP, Allegheny County, 2017-2021

Year	Number of Bites (%)
2017	104 (5.5)
2018	103 (5.2)
2019	86 (4.2)
2020	55 (4.3)
2021	18 (0.8)



DISCUSSION

In summary, among the 2,258 animal bites reported to the ACHD in 2021, most involved dogs, which were implicated on 75.7 percent of all bite reports; cats, the second most reported animal, were involved in 19.6 percent of the reported bites. The most common wild animals involved in bites were bats and raccoons.

Of 380 animals from Allegheny County tested for rabies at the Public Health Laboratory, 15 (3.9%) tested positive, and four bats had known human exposure. However, only one person exposed to a rabid bat was in the bite report data for 2021. Most likely, the hospitals treating the other persons exposed to rabid bites did not report the exposures. The number of rabid animals identified in Allegheny County in 2021 is similar to the number reported in 2020, and wild animals remain the main population for rabies in Allegheny County.

Certain dog breeds were overrepresented in bite reports compared to county licensing data in 2021, including pit bulls, German shepherds, bulldogs, rottweilers, huskies, labradoodles, and mastiffs. These dogs may be more aggressive, or their bites cause more severe injuries because of their size. Pit bulls accounted for 244 bites.

Animal bites can be a source of infection and should be properly cleansed.³ Thorough washing of the wound plays an important part in preventing rabies in bite victims.² Our data indicate that 64.7 percent of reported bites were cleansed, but this may be an underestimate as this information may not be recorded on the bite form. Antibiotics were prescribed for 66.6 percent of bites in Allegheny County in 2021. According to the American Academy of Family Practice (AAFP) guidelines, antibiotic prophylaxis should be considered for all bites requiring closure and for high-risk bites. Cat bites are considered high risk for infection,⁵ and 74.0 percent of cat bite victims received antibiotics in 2021. The AAFP antibiotic of choice, amoxicillin/clavulanate (Augmentin), was prescribed for 64.3 percent of reported bites.⁵

In Allegheny County in 2021, 30.3 percent of victims received a tetanus vaccine. This is recommended if the victim had not received the tetanus vaccine in the last 10 years or if vaccination status is unknown.³ If a victim is unsure when they last received a tetanus shot, health care providers should consult the Pennsylvania Statewide Immunization Information System (PA-SIIS) to see when the last tetanus vaccine was administered; however, PA-SIIS does not include vaccines given out of state or by providers who do not submit data. The ACHD is not able to assess the appropriateness of tetanus vaccination from bite report data.

The rabies PEP regimen should only be administered if someone is exposed to: 1) a rabid animal, 2) a domestic animal that cannot be quarantined for observation, or 3) an animal that cannot be tested for rabies. Of bite victims reported to ACHD, three reportedly completed the PEP regimen unnecessarily. Some persons began the regimen, but stopped, most likely because the biting animal tested negative or was located and quarantined.

The number of animal bites reported to ACHD increased by 27 percent from 2013 to 2021. This trend may reflect an increase in the number of animal bites annually, or it may reflect an increase in care-seeking behavior or improved reporting within this timeframe.



RECOMMENDATIONS

1. **Avoid contact with wild animals.** Do not attempt to feed, touch, or take in wild animals as pets. Avoid contact with dead wild animals to prevent rabies exposure.
2. **Pet owners should comply with Pennsylvania’s rabies vaccine regulations for pets.** All pet owners should have their pets vaccinated by three months of age, and rabies vaccinations should be kept up to date throughout the pet’s lifetime. This will protect pets and their owners from rabies virus. Pets should be supervised in situations where they could encounter wildlife.
3. **Health care providers should be familiar with the protocol for treatment of animal bites, rabies PEP, and reporting requirements.** Health care providers should follow current guidelines and recommendations for treating animal bites. Health care providers should only recommend/provide the PEP vaccine series for rabies if the victim was exposed to an animal that had rabies, an animal that could not be observed during a quarantine period, or an animal that could not be tested for rabies. Health care providers should check PA-SIIS for information on tetanus vaccinations, although the database may not be complete. Providers should continue to report bites to the Health Department.
4. **Deceased animals should be submitted for rabies testing.** If pets involved in bites are euthanized during the quarantine period, the animal should be submitted for rabies testing. If bats are found in the home in rooms where people were sleeping, they should be captured and submitted for testing at the ACHD laboratory. To safely capture a bat, wear thick work gloves and place a container over the bat when it lands. Slip a piece of cardboard underneath the container and tape it shut. Be careful to avoid contact with the bat. If there is no reason to suspect contact between the bat and humans or pets, release the bat outdoors.

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