2013

Rabies in Maricopa County

Department of Public Health
Office of Epidemiology
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Introduction

In 2006, the Maricopa County Department of Public Health (MCDPH), Office of Epidemiology, developed and initiated a comprehensive surveillance system that tracks the number of rabies risk assessments conducted, types of exposures, risk factors, and number of individuals that received post-exposure prophylaxis. This report describes epidemiological trends in rabid animals, as well as the trends in human exposures to animals reported to MCDPH for rabies risk assessments in 2013. For information about rabies transmission, symptoms, diagnosis, treatment, and prevention, please visit the MCDPH rabies webpage.

Rabies History

Rabies in the United States has changed dramatically over the past 100 years. The number of rabies-related human deaths in the United States has declined from more than 100 annually in 1900 to two or three each year.

Important Years in AZ Rabies History

1982 The last documented case of rabies in a cat in Maricopa County. The case was vaccine-associated – that is, the disease was caused by the rabies vaccine given to the dog.*

1981 The last documented human case of rabies in Arizona. This case was bitten by a rabid dog in Mexico.

1977 The last documented case of rabies in a dog in Maricopa County. This case was also a vaccine-associated infection.

1973 The last non-vaccine-associated infection in a dog in Maricopa County.

*Vaccine-associated infections no longer occur in the United States because the vaccine has been changed from a live attenuated vaccine to a killed virus vaccine.

Currently in Arizona, the principal rabies hosts are bats, skunks, and foxes (**Table 1)**. In Maricopa County, the majority of animals that test positive for rabies are bats (**Table 3**). Recent data suggest that transmission of rabies virus can occur from minor or unrecognized bites from bats. This makes bats the most concerning source of possible rabies infection in Arizona**. Since bat bites can be relatively minor or even unrecognized, it is especially important that all human interactions with bats be assessed for the need to start rabies post-exposure prophylaxis.** Human interaction with ANY wild animal should be assessed for the risk of rabies by the local health department, as they present a medium to high risk for rabies. Because of the rarity of rabies in domestic animals in Maricopa County, exposures to cats and dogs are considered very low risk for rabies transmission.

The only way to confirm that a wild animal has rabies is to test its brain tissue in an approved laboratory. In cases of domestic animals, cats and dogs may be quarantined in order to watch for symptoms of rabies under the guidance and supervision of local animal control officials.

Table 1. Confirmed rabies positive animals in Arizona by year, 2003-2013*

	Bat	Skunk	Fox	Bobcat	Coyote	Cat	Dog	Other [Δ]	Total
2003	44	8	18	4	1	0	0	0	**75**
2004	75	24	17	2	2	0	0	0	**120**
2005	84	67	12	2	1	2	0	1	**169**
2006	96	16	22	3	1	1	0	1	**140**
2007	115	13	24	6	1	0	0	0	**159**
2008	89	51	21	7	4	0	1	3	**176**
2009	69	144	51	8	2	1	0	5	**280**
2010	34	58	4	4	0	0	0	3	**103**
2011	47	13	7	1	0	0	0	2	**70**
2012	43	14	1	0	0	0	0	2	**60**
2013	43	18	4	4	1	0	0	0	**70**
Total	**739**	**426**	**181**	**41**	**13**	**4**	**1**	**17**	**1422**

*Source: Arizona Department of Health Services data

[Δ] Other includes 4 horses, 4 javelinas, 2 mountain lions, 1 cow, 2 badgers, 2 coati, 1 ringtail, and 1 raccoon

Changes in the numbers of rabies positive animals each year can be attributed to natural fluctuations in animal populations, changes in the surveillance process—including the triaging of animals for lab testing, and the impact of rabies management programs.

Table 2. Confirmed rabies positive animals in Arizona by year and county, 2003-2013*

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Apache	0	0	0	0	0	0	0	0	0	1	0	**1**
Cochise	18	9	13	5	7	12	39	17	5	6	4	**135**
Coconino	7	9	4	4	7	7	35	2	3	3	1	**82**
Gila	2	6	2	13	21	11	7	2	0	0	5	**69**
Graham	3	1	2	0	1	1	0	0	1	0	0	**9**
Greenlee	0	0	2	5	8	12	3	0	1	0	0	**31**
La Paz	0	1	1	0	0	0	1	0	0	1	0	**4**
Maricopa	11	12	12	9	17	23	13	9	5	1	6	**118**
Mohave	2	0	0	0	2	0	0	2	0	0	0	**6**
Navajo	1	0	0	2	1	0	0	3	1	0	2	**10**
Pima	22	64	107	81	79	65	86	27	33	28	37	**629**
Pinal	4	7	7	9	7	16	11	7	9	5	1	**83**
Santa Cruz	1	6	12	7	3	16	70	29	7	12	12	**175**
Yavapai	3	3	7	4	6	11	15	4	4	2	2	**61**
Yuma	1	2	0	1	0	2	0	1	1	1	0	**9**
Total	**75**	**120**	**169**	**140**	**159**	**176**	**280**	**103**	**70**	**60**	**70**	**1422**

*Source: Arizona Department of Health Services data

Table 3. Confirmed rabies positive animals in Maricopa County by year and animal, 2003-2013*

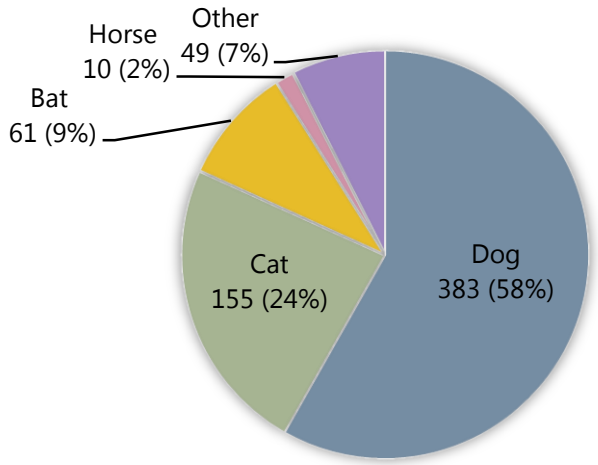
	Bat	Skunk	Fox	Other	Total Positive
2003	10		1		**11**
2004	9		2	1 bobcat (Arizona gray fox variant)	**12**
2005	11			1 bobcat (Arizona gray fox variant)	**12**
2006	9				**9**
2007	16			1 bobcat (variant typing not performed)	**17**
2008	21			1 coyote (Arizona gray fox variant) 1 horse (Big brown bat variant)	**23**
2009	11		1	1 horse (North central skunk variant)	**13**
2010	8			1 bobcat (variant typing not performed)	**9**
2011	3			1 javelina (Arizona gray fox variant?) 1 bobcat (variant typing not performed)	**5**
2012	1				**1**
2013	6				**6**

*Source: Arizona Department of Health Services data

Rabies Risk Assessments in Maricopa County

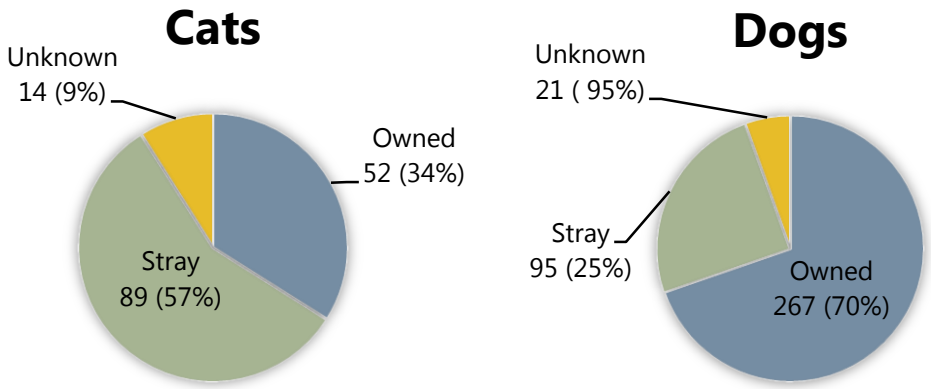
The MCDPH Office of Epidemiology conducts risk assessments for people who have had interactions with animals that may pose a possible threat of transmitting rabies. Risk assessments consider the following factors: type of exposure, presence of animal rabies in the area where the contact occurred, species of animal, and circumstances of the exposure incident. With this information, recommendations are made regarding the need for rabies prophylaxis, animal testing, or quarantine. For information about potential exposure to rabies and when to contact epidemiologists at MCDPH for a risk assessment, please visit the MCDPH rabies exposure and rabies assessment webpages.

Figure 1. Human exposures* to all animals reported to the Maricopa County Department of Public Health for rabies risk assessments in 2013 (n=658)†



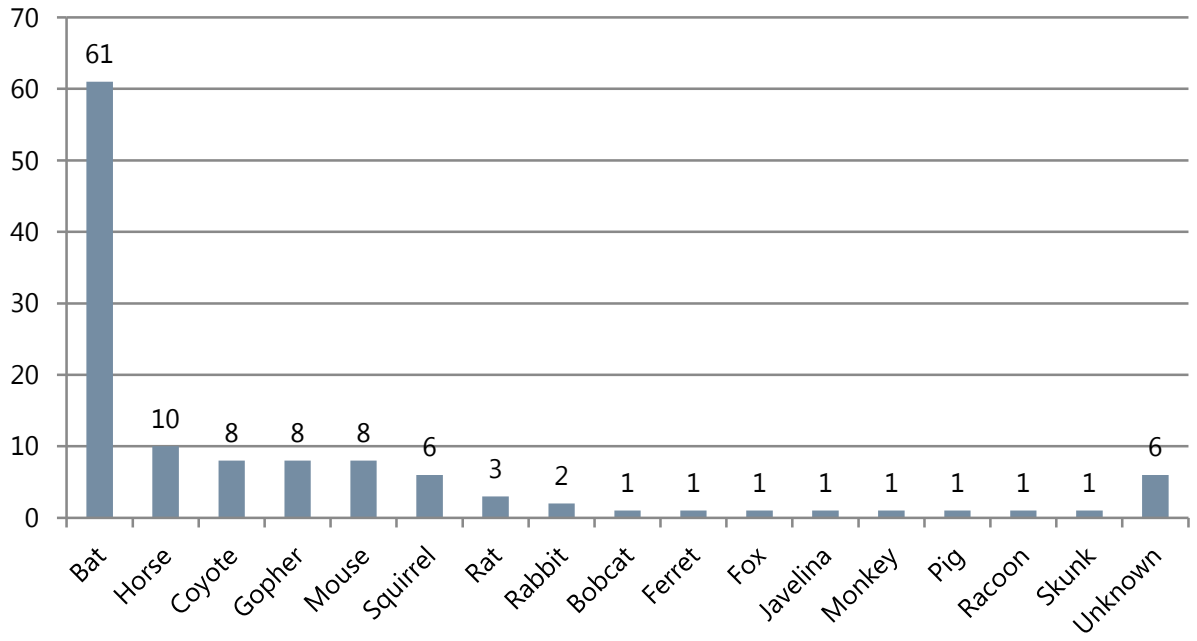
† Source: Maricopa County Department of Public Health data
** Note: The numbers graphed here reflect the total number of assessments done, regardless of exposure risk*
*** "Other" includes: Coyote (8), Gopher (8), Mouse (8), Squirrel (6), Rat (3), Rabbit (2), Bobcat (1), Ferret (1), Fox (1), Javelina (1) Monkey (1), Pig (1), Raccoon (1), Skunk (1), and Unknown (6). See Figure 3 for further details.*

Figure 2. Human exposures* to domestic cats and dogs reported to the Maricopa County Department of Public Health for rabies risk assessments in 2013 (n=538)†



† Source: Maricopa County Department of Public Health data
** Note: The numbers graphed here reflect the total number of assessments done, regardless of exposure risk*

Figure 3. Human exposures* to wild animals and livestock reported to the Maricopa County Department of Public Health for rabies risk assessments in 2013 (n=120)†



†Source: Maricopa County Department of Public Health data
**Note: The numbers graphed here reflect the total number of assessments done, regardless of exposure risk*

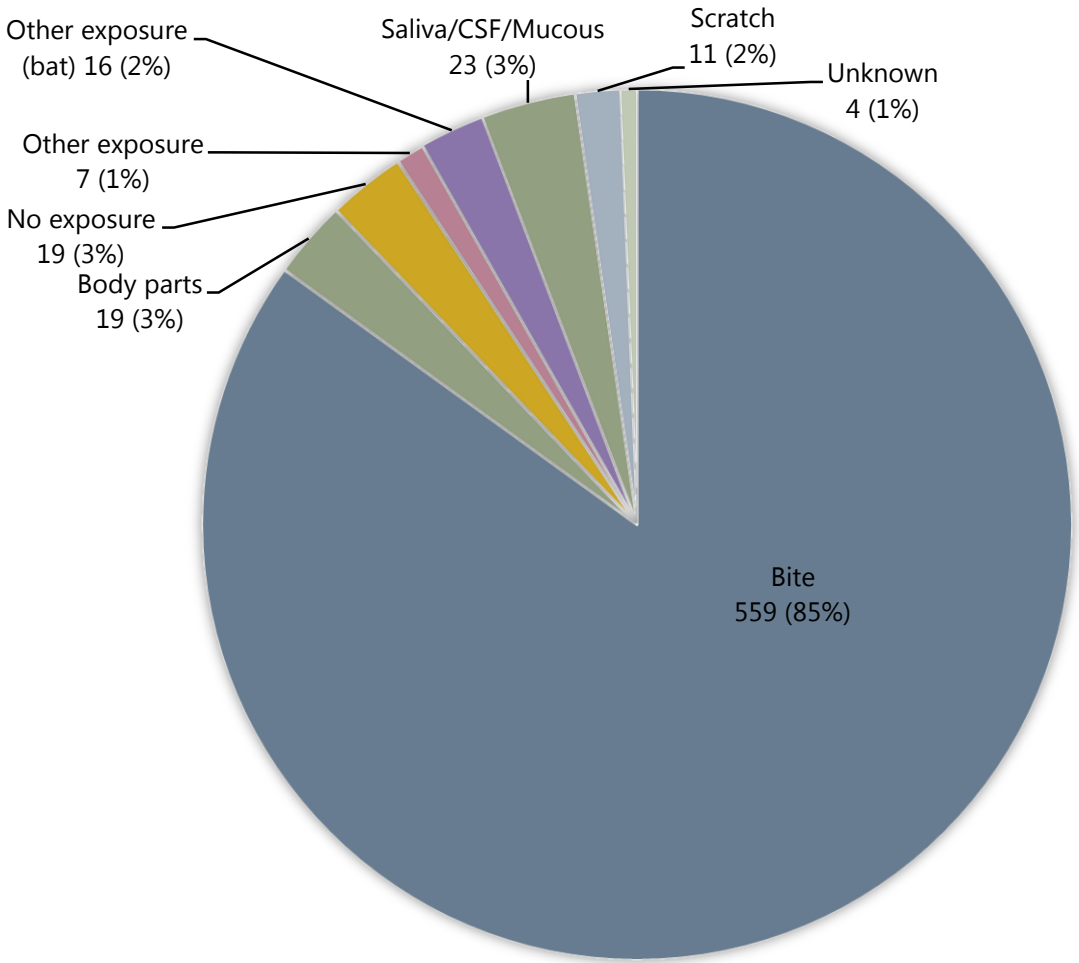
Bite vs. Non-Bite

Bite: any penetration of the skin by the teeth of an animal.

Bites to areas with a large number of nerves, such as the face, neck, and/or hands may be quicker to progress to the symptomatic phase of rabies. The site of the bite should not influence the decision whether or not to receive post-exposure prophylaxis. However, the site and severity of a wound should influence the decision whether to start treatment immediately or await quarantine and/or rabies test results.

Non-Bite: the contamination of open wounds, abrasions, mucous membranes, or scratches with saliva or other potentially infectious material (such as neural tissue) from a suspected rabid animal.

Figure 4. Human exposures to all animals reported to the Maricopa County Department of Public Health for rabies risk assessments in 2013 by type of exposure (n=658)†



†*Source: Maricopa County Department of Public Health data*

Provoked vs. Unprovoked

The mental state of an animal can give some indication of whether or not an animal may be infected with rabies. Thus, part of a rabies risk assessment includes assessing the animal's behavior when it bit or scratched a human. In most cases, unprovoked animal bites/attacks are considered to be a higher risk.

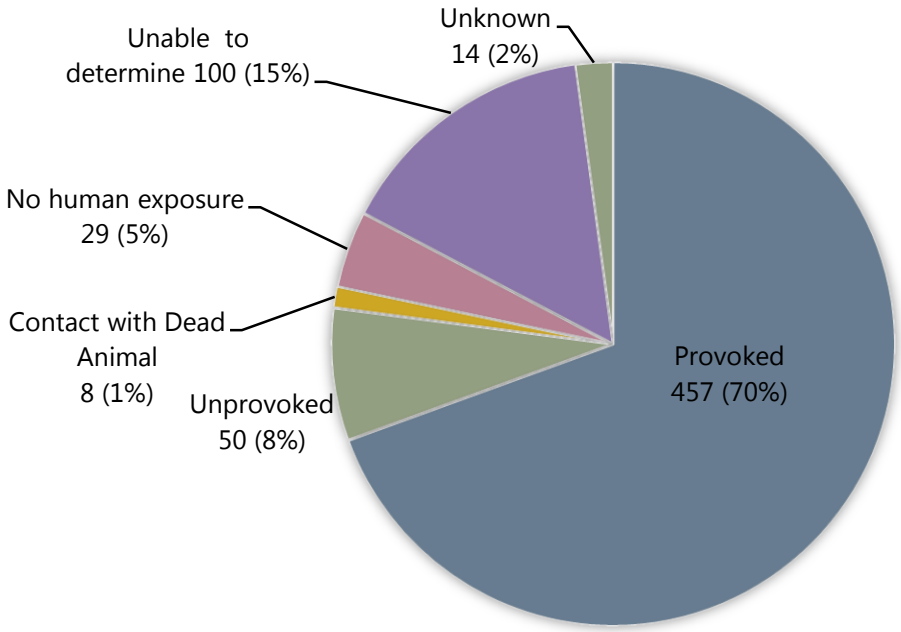
A bite might be considered provoked if:

- An animal was taunted or yelled at
- An animal with its young was approached
- An animal was struck or injured
- An animal with impaired vision, hearing, or mobility was approached
- Fighting animals were broken up
- A human entered a domestic dog or cat's yard or space
- An animal was approached while eating or sleeping
- An animal was chasing an object/person or being chased
- A stray, feral, or wild animal was approached

A bite might be considered unprovoked if:

- A wild animal had no fear of humans
- An animal seemed unhealthy
- An animal exhibited abnormal behavior
- An animal was aware of an individual's presence and the individual was not approaching or menacing

Figure 5. Human exposures to all animals reported to the Maricopa County Department of Public Health for rabies risk assessments in 2013 by type of animal exposure (n = 658)†



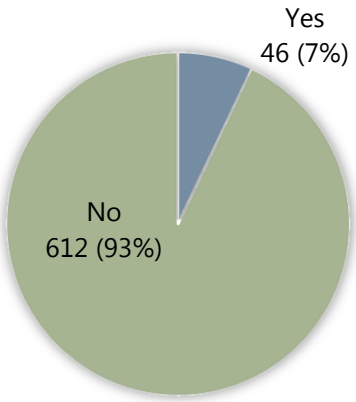
†Source: Maricopa County Department of Public Health data

Prophylaxis

Post-Exposure Prophylaxis (PEP)

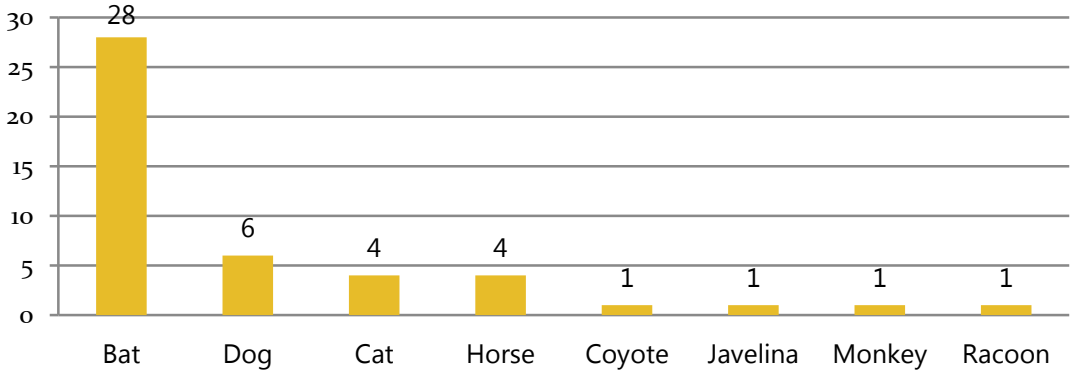
When an individual is assessed to be at high risk for rabies, the MCDPH recommends rabies post-exposure prophylaxis (PEP). In 2013, of the 658 rabies risk assessments conducted, MCDPH recommended starting PEP in 46 of these assessments (**Figure 6**). For more information about PEP, please visit the MCDPH webpages for rabies treatment and resources for healthcare professionals.

Figure 6. Human exposures to all animals reported to the Maricopa County Department of Public Health for rabies post-exposure risk assessments in 2013 by MCDPH PEP recommendation (n = 658)†



†Source: Maricopa County Department of Public Health data

Figure 7. Maricopa County Department of Public Health 2013 affirmative PEP recommendations by species (n=46)†



†Source: Maricopa County Department of Public Health data

Pre-Exposure Prophylaxis

Question: Who should receive pre-exposure prophylaxis?

Answer: Any persons that are at high risk for being exposed to rabies during work, play, or travel, should consider rabies pre-exposure prophylaxis.

This might include:

- Rabies research laboratory workers
- Rabies biologic production
- Spelunkers
- Veterinarians and staff
- Diagnostic laboratory workers
- All persons who frequently handle bats
- Animal control and wildlife workers in rabies enzootic areas

Receiving pre-exposure prophylaxis does not eliminate the need for rabies evaluation after a potential rabies exposure.

For further information about rabies, please see the following websites:

Maricopa County Department of Public Health (MCDPH)

MCDPH Rabies Website
Available at: http://www.mcrabies.org

Arizona Department of Health Services (ADHS)

Arizona Manual for Rabies Control and Bite Management
Available at: http://www.azdhs.gov/phs/oids/vector/rabies/pdf/AZRabiesManual.pdf

ADHS Rabies Website
Available at: http://www.azdhs.gov/phs/oids/vector/rabies/

Centers for Disease Control & Prevention (CDC)

Human Rabies Prevention – United States, 2008
Recommendations of the Advisory Committee on Immunization Practices (ACIP)
MMWR 2008; 57: (No. RR-3)
Available at: http://www.cdc.gov/mmwr/PDF/rr/rr5703.pdf

Use of a Reduced (4-Dose) Vaccine Schedule for Post-exposure Prophylaxis to Prevent Human Rabies.
Recommendations of the Advisory Committee on Immunization Practices (ACIP).
MMWWR 2010; 59: (No. RR-2)
Available at: http://www.cdc.gov/rabies/resources/acip_recommendations.html

CDC Rabies Website
Available at: http://www.cdc.gov/rabies

ANIMAL BITE REPORTING AND MANAGEMENT

Please report all dog & cat bites to the appropriate municipal animal control office:

- **Avondale PD/Animal Control** – (623) 333-7345
- **Mesa Animal Control** – (480) 644-2268
- **Peoria PD/AC** – (623) 773-8311
- **Surprise PD/AC** – (623) 222-4000
- **Wickenburg** – (928) 684-5411

All other bites not covered by one of the cities listed above:

- **Maricopa County Animal Care & Control (MCACC)** – (602) 506-7387
  Bites can also be reported to MCACC by FAX – (602) 506-2773 or online at:
  https://www.maricopa.gov/pets/or.aspx

To receive a rabies risk assessment, rabies testing information, post-exposure rabies prophylaxis recommendations, or report other disease situations that may have zoonotic disease potential, call:

- **Maricopa County Department of Public Health** – (602) 747-7111

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