



Bats & Rabies in Maine

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BACKGROUND

Animal rabies is a reportable condition in Maine. Rabies is endemic in wildlife. The most commonly infected animals are raccoons, skunks, foxes, and bats. While terrestrial animals comprise the majority of rabid animals, bats are unique in that their bites can be difficult to detect.

From 1990-2007, a total of 34 human cases of rabies were attributed to bat exposure in the United States; 11 of those went unrecognized. Prompt recognition and reporting of possible exposures is critical to ensure appropriate management and assessment of the need for post-exposure prophylaxis. Rabies is almost always fatal without timely administration of post-exposure prophylaxis following a true rabies exposure.

This study aims to determine if bat rabies is on the rise in Maine. Based on a perceived higher volume of calls about rabies and bats, this was an area of concern. In this study, both the number of bats submitted for rabies testing and the number of calls to Maine CDC about rabies are analyzed to determine if there was an increase from 2010 to 2011.

METHODS

Maine CDC's Health and Environmental Testing Laboratory (HETL) performs rabies testing on animals that had contact with a human, domestic animal, or livestock. HETL follows the CDC Protocol for Postmortem Diagnosis of Rabies in Animals by Direct Fluorescent Antibody Test. In the past two years, testing has been correct 100% of the time by Wisconsin State Health Department proficiency testing.

The National Association of State Public Health Veterinarians (NASPHV) defines a rabies exposure as occurring "when the virus is introduced into bite wounds, open cuts in skin, or onto mucous membranes from saliva or other potentially infectious material such as neural tissue." Bat exposures are often difficult to detect, especially in the cases of a sleeping person awakening to a bat in the room or an adult witnessing a bat in a room with a previously unattended child, mentally disabled person, or intoxicated person. Maine CDC epidemiologists are available for consultation 24/7 to assess potential exposures and make public health recommendations.

The Maine Rabies Management Guidelines, authored by the Maine Rabies Workgroup to follow state law and national guidance, recommends submitting all wild animals, including bats, that had contact with a human or domestic animal for rabies testing. If the animal is unavailable for testing, Maine CDC epidemiologists will assess the exposure to determine the need for human rabies post-exposure prophylaxis (PEP) and/or will work with partners to implement appropriate control measures for exposed domestic animals and livestock. Rabies PEP consists of a regimen of one dose of immune globulin on day 0 and four doses of rabies vaccine on days 0, 3, 7 and 14, with day 0 being the day treatment is started.

HETL inputs positive lab results into STARLIMS, which then cross electronically into the National Electronic Disease Surveillance System (NEDSS). Maine CDC epidemiologists used rabies data from NEDSS for this analysis. Additionally, a query was performed on a Microsoft Access consult database and data on rabies consults in 2010-2011 were analyzed. All analyses were conducted using SAS statistical software version 9.2.

RESULTS

There were 769 consults regarding rabies year to date in 2011 (Figure 1). Approximately 830 consults were received regarding rabies in 2010, but only 472 consults were received regarding rabies as of 10/31/2010. This is 61% fewer rabies consults in 2010 than for the same time period in 2011.

As of 10/31/2011, 535 animals were submitted for rabies testing following a human, domestic animal, or livestock exposure in 2011; 211 (39%) were bats. Fifty-nine (11.5%) animals tested positive for rabies; five (8.5%) were bats (Table 1). In 2010, 539 animals were submitted to HETL for testing following a human, domestic animal, or livestock exposure; 162 (30%) were bats. Sixty-two (11.9%) animals tested positive for rabies; five (8%) were bats.

Figure 1. Proportion of consults that pertain to rabies, Maine 2010-2011

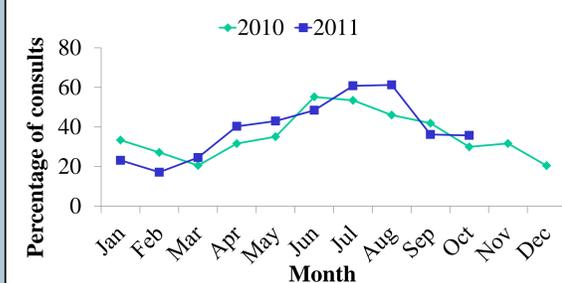


Figure 2. Animal rabies in Maine, 2010-2011 (as of 10/31/2011)

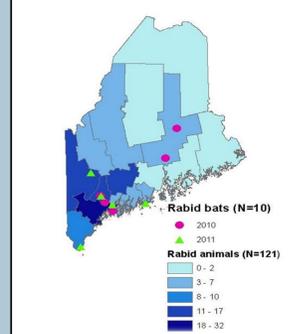


Table 1. Animal rabies by species and year, Maine

Animal	2010				2011 (as of 10/31/11)			
	Submitted	Tested	Positive	% positive	Submitted	Tested	Positive	% positive
Alpaca					1	1		
Bat	162	153	5	3.3	211	195	5	2.6
Bobcat					1	1	1	100
Cat	122	122	1	0.8	126	126	2	1.6
Cow	5	5			3	3		
Coyote	4	4			2	2		
Deer					1	1		
Dog	73	73			58	58		
Fisher					1	1		
Fox	18	17	7	41.2	20	18	11	61.1
Goat	4	4			4	4		
Horse	2	2			5	4	1	25
Mink	2	2			1	1		
Mouse	2	1			1	1		
Opossum	1	1			2	2		
Rabbit	1	1			1	1		
Raccoon	61	61	28	45.9	44	44	28	63.6
Sheep	3	3			3	3	1	33.3
Skunk	54	52	20	38.5	36	35	10	28.6
Squirrel	6	1			2	2		
Wolf Hybrid					1	1		
Woodchuck	19	19	1	5.3	11	10		
Total	539	521	62	11.9	535	514	59	11.5

RESULTS, cont'd.

As of 10/31/2011, 134 Mainers initiated PEP in 2011. Fifty-nine (44%) initiated PEP as a result of contact with a bat. Thirty-three bats were implicated in these exposures. Eight of these bats (24.2%) were euthanized and submitted for rabies testing, of which two tested positive for rabies and six were unsatisfactory for testing. One bat (3.1%) was euthanized but was not submitted for testing. The remaining 24 bats (72.7%) were not captured. Four persons initiated PEP after exposure to the rabies-positive bats. The remaining 55 persons could have avoided PEP if the bat was either captured or submitted properly.

In 2010, 77 Mainers initiated PEP. Thirty-one (40%) initiated PEP as a result of contact with a bat. Twenty-three bats were implicated in these exposures. Five of these bats (21.7%) were euthanized and submitted for rabies testing, of which one tested positive for rabies and four were unsatisfactory for testing. The remaining 18 bats (78.3%) were not captured. Two persons initiated PEP after exposure to the rabies-positive bat. The remaining 29 persons could have avoided PEP if the bat was either captured or submitted properly.

CONCLUSIONS

Though the number of rabies consults increased in 2011 compared to the same time period last year, the number of bats submitted and that tested positive remains stable. Approximately the same proportion of persons exposed to a bat in 2010 and 2011 initiated PEP. In both years, the majority of bats implicated in possible exposures were not captured. These findings indicate a need for public education about bat rabies, including how to recognize exposures and in which circumstances bats should be submitted for rabies testing.

A limitation of this analysis is that the consult database does not consistently capture whether a rabies consult was in particular regarding a bat. A second limitation is that the count of positive animals statewide may not be representative of the true incidence of animal rabies in Maine because results are based only on those animals submitted for testing due to contact with a human, domestic animal, or livestock. Another consideration is that bats are being threatened by white nose syndrome (WNS), an emerging bat disease caused by a fungus that is not known to cause illness in humans. A bat infected with WNS may exhibit behavioral changes that could be mistaken for rabies.

Epidemiologists investigate all reports of lab-confirmed rabid animals and make recommendations to protect human and animal health. Since bats play a critical role in maintaining healthy ecosystems and are now facing a devastating disease (WNS), testing should only be considered if a potential exposure occurred.

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