

Raccoon Rabies—Connecticut, 1991-2004

The raccoon rabies epizootic reached Connecticut in March 1991, entering Fairfield County from New York (1). Influenced by habitat and natural barriers, it initially spread northeast before extending throughout the state over the next 5 years (2). This resulted in the first rabid domestic animals in the state since the 1940s. Rabies testing done at the Department of Public Health (DPH) Laboratory allows the DPH to monitor the occurrence of rabies among wild and domestic animals and to guide the medical management of patients exposed to potentially rabid animals.

From 1991 to 2004, 5479 terrestrial mammals tested positive for rabies including 5347 (98%) wild animals (Table 1). Of the wild animals, 4169 (78%) were raccoons, the principal rabies reservoir in the northeastern United States, and 1059 (20%) were skunks. Among wild rodents, only woodchucks tested positive. Of the 132 rabid domestic animals, 94 (71%) were cats, and 15 (11%) were cattle.

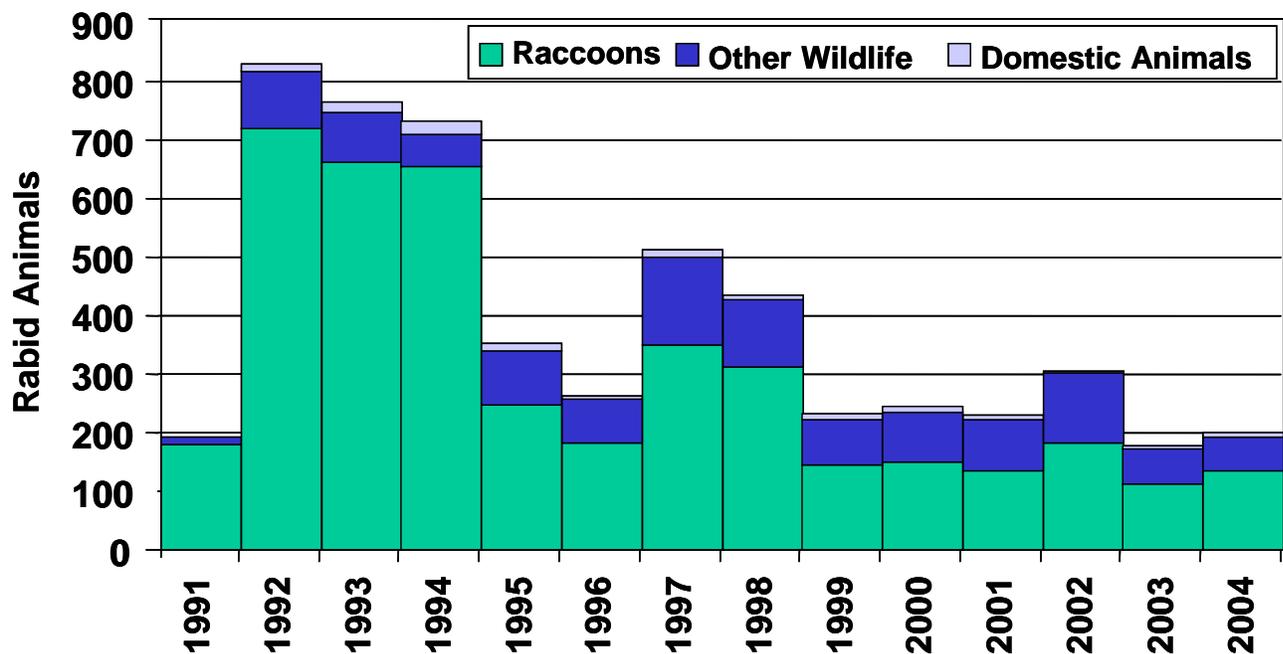
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Table 1. Rabid terrestrial animals by species, Connecticut 1991-2004

| Wild Animals | | Domestic Animals | |
|--------------|------------------|------------------|-----------------|
| | No. % | | No. % |
| Raccoon | 4169 (78) | Cat | 94 (71) |
| Skunk | 1059 (20) | Cattle | 15 (11) |
| Fox | 59 (1) | Dog | 7 (5) |
| Woodchuck | 53 (1) | Horse | 7 (5) |
| Coyote | 3 (<1) | Goat | 4 (3) |
| Bobcat | 2 (<1) | Sheep | 3 (2) |
| Deer | 1 (<1) | Rabbit | 1 (<1) |
| Otter | 1 (<1) | Ferrett | 1 (<1) |
| Total | 5347(100) | Total | 132(100) |

Figure 1. Number of rabid terrestrial animals by year*, Connecticut 1991-2004



* Numbers do not include bats.

The annual number of rabid animals ranged from 831 in 1992, the first full year of the epizootic in Connecticut, to 177 in 2003 (Figure 1, page 5). The number of raccoons that tested positive for rabies ranged from 720 in 1992 to 112 in 2003. Raccoons accounted for 59%-94% annually of the animals identified with rabies.

Reported by: R Nelson, DVM, MPH, S Ertel, Epidemiology and Emerging Infections Program; T Brennan, BA, State Public Health Laboratory, Department of Public Health.

Editorial Note:

In the eastern United States, enzootic rabies in raccoons is found in 20 states including Connecticut (3). Nationally, these states account for 81% of all wild animals identified with rabies and 99% of the total number of rabid raccoons. In 2003, a resident of Virginia became the only documented human rabies case attributed to the raccoon strain of the virus (4). Since 1994, rabies has been present in all eight Connecticut counties. Rabies virus transmission will likely continue within this species and be accompanied by infection of other wild and unvaccinated domestic animals. Physicians, veterinarians, local health department staff, and animal control officers (ACO) will frequently be faced with rabies prevention issues.

Reduction of farming in northeastern states resulted in reforestation and created a habitat that can support a large raccoon population. Raccoons are highly adaptable and frequently found in residential suburban and urban settings. With emergence of a rabies virus variant adapted to raccoons, this species has become the major rabies reservoir in North America.

Annual numbers of positive animal tests for rabies reflect variation in the raccoon population density and testing criteria. Rabies initially causes high mortality in dense raccoon populations resulting in fewer opportunities for transmission. The population is reestablished in 4 to 5 years and rabies transmission again increases.

In 1991, the DPH initially tested all dead wild animals to monitor the spread of rabies. Over the next 3 years, rabies was confirmed in all areas of the state, and testing was done when the animal species and nature of the contact indicated a risk of virus transmission to people or domestic animals.

Transmission of rabies requires contamination of a wound or mucous membrane by saliva or central nervous system tissue. Animal species, type of contact, circumstances of the incident, and rabies

Rabies Information and Technical Assistance

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| The Department of Public Health, Epidemiology Program | (860) 509-7994 after hours (860) 509-8000 |
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For questions about management of human exposures

www.dph.state.ct.us/BCH/infectiousdise/rabies.htm

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|--|----------------|
| The Department of Agriculture, Animal Control Division | (860) 713-2506 |
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For questions about domestic animals .

www.ct.gov/doag/cwp/view.asp?a=1367&q=259098

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| The Department of Environmental Protection, Wildlife Division | (860) 424-3011 |
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| Law Enforcement Division | 24 hour emergency dispatch (860) 424-3333 |
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For questions about wild animals.

www.dep.state.ct.us/burnatr/wildlife/problem.htm

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| Centers for Disease Control & Prevention | (877) 554-4625 (24 hours) |
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www.cdc.gov/ncidod/diseases/submenus/sub_rabies.htm

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|--------------------------------------|----------------------------------|
| Sanofi Pasteur Chiron Corporation | (800) 822-2463 (800) 244-7668 |
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To order human rabies immunoglobuline and vaccine.

immunization status are factors considered in evaluation of potential rabies exposures (5). Although all mammals can potentially transmit rabies, bites from rabies reservoir species and wild carnivores are the most likely to result in transmission to people or domestic animals. If possible, these animals should be submitted for testing. Small rodents such as squirrels and mice present a minimal risk and need to be tested when a bite is unprovoked and not when a person initiates the contact (e.g., attempting to pick up or feed the rodent.)

Non-bite exposures have rarely and under very unusual circumstances caused rabies in people (6,7). No documented cases have been attributed to indirect transmission such as touching potentially contaminated fomites. Blood, urine, feces, and skunk spray do not transmit the virus. Local, state, and federal health agencies are available to assist physicians evaluate potential

exposures and the need for animal testing or human post-exposure prophylaxis.

People who are bitten by domestic animals should report the incident to a local or state ACO. The ACO will investigate the incident and establish the course of action to be taken. The ACO is authorized to determine the need for immediate rabies testing of the biting animal or if it should be observed in quarantine for 14 days. While properly immunized adult domestic animals present a small risk of rabies transmission, testing or quarantine may be ordered. Testing is performed Monday through Saturday at the DPH Laboratory.

References

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6. Afshar A. A Review of Non-bite Transmission of Rabies Virus Infection. Br Vet J 1979;135:142-148.
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Bat Rabies – Connecticut, 2004

Rabid bats have been found nearly every year since 1959, when the bat strain of the virus was first identified in Connecticut. In 1995, a strain of rabies virus found in Silver-haired bats was responsible for the only human rabies infection, and subsequent death, acquired in Connecticut since 1932 (1). Testing and identification of rabid bats by the Department of Public Health (DPH) Laboratory has increased over the past decade.

During 2004, 26% of all animals tested by the DPH for rabies were bats. Of the seven species tested, the most commonly tested was the Big Brown that accounted for 81% of all bats tested. Each of Connecticut's 8 counties submitted specimens with a combined 70% from Fairfield, Hartford, and New Haven counties (Table 1). These counties are the most populous in the state. Of bats tested, 585 (80%) were collected from May-September. While potential direct human contact with a bat was reported for 607 (83%) bat specimens, 542 (89%) did not involve a known bite or scratch.

Table 1. Bats tested for rabies by county of origin, Connecticut 2004

| County | Total | Positive (%+) |
|--------------|------------|-----------------|
| Fairfield | 281 | 9 (3.2) |
| Hartford | 141 | 4 (2.8) |
| Litchfield | 76 | 4 (5.4) |
| Middlesex | 30 | 0 (0) |
| New Haven | 105 | 3 (2.9) |
| New London | 39 | 1 (2.6) |
| Tolland | 41 | 2 (4.9) |
| Windham | 13 | 0 (0) |
| Unknown | 3 | 0 (0) |
| Total | 729 | 23 (3.2) |

The 23 (3%) rabid bats included 20 (87%) Big Brown and one each of Hoary, Northern Long-eared, and Eastern Pipestrelle. Rabid bats were found in six counties with 9 submitted from Fairfield County (Table 1). Of the 23 rabid bats, 18 (78%) were collected during May-September. The overall positivity rate was 3% (18/585). People were potentially exposed to rabies from 20 of the bats; 3 persons were bitten, and 17 had non-bite exposures.

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Editorial Note:

From 2000-2004, 15 human cases of domestically acquired rabies were reported in the United States (2). Antigenic and genetic analysis determined that 14 of the cases were infected with bat-associated strains and one with the mid-Atlantic (raccoon) strain. Four cases were transplant recipients who received organs from a person who unknowingly died of rabies. Of the 10 persons who died of presumed direct contact with bats, only 3 had a known history of a bat bite and none sought medical treatment.

The eight bat species that can be found in Connecticut are all insectivorous, and contacts with people and other animals are generally accidental. While bat strains can infect other animal species, they do not play a role in propagation of rabies in other animals. Infections with bat-associated strains in people and

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domestic animals are likely due to direct contact with bats even when exposure circumstances are not known. Bats are the smallest of the rabies reservoir species. Bites cause relatively small wounds with mild pain and may go unrecognized or be considered unimportant.

Exposures include instances when a person has direct contact with a bat and a wound cannot be confidently ruled out (3). Examples of direct contacts that should be of concern for unrecognized bites include bats touching an individual's bare skin, or persons unaware of the part of a bat's body they may have touched (e.g., when stepping on a bat with bare feet). Potential exposures also include persons who were in the same room as the bat and may not have recognized that direct contact occurred. Examples include finding a bat in the same room as a sleeping person, or a young child who is unable to communicate the incident.

In cases of possible exposure, the bat should be captured without damaging the head. If the bat is flying, allow it to land. While wearing gloves, place a can or box over the bat and slip a piece of cardboard underneath to trap it. The bat should be

humanely euthanized (contact a veterinarian, Animal Control Officer, or Local Health Department for advise). If the bat is not available for testing, rabies post-exposure prophylaxis (PEP) should be considered

During summer months, bats are frequently also encountered in camp settings. Several species of bats found in Connecticut depend on deciduous forest for habitat and may be noted near cabins or enter camp buildings that are not bat proofed. To minimize unnecessary PEP, it is important to avoid the conclusion that all instances of simply being in proximity to a bat indoors or outdoors should be treated as an exposure. Evaluation of circumstances should indicate a reasonable probability exists that an exposure occurred based on national guidelines .

References

1. Connecticut Department of Public Health. Human Rabies Case. Connecticut Epidemiologist 1995;15:21-22.
2. Krebs J et al. Rabies Surveillance in the United States during 2003. JAVMA 2004;225:1837-1849.
3. CDC. Human Rabies Prevention – United States, 1999. MMWR 1999;48:1-21.

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