

Update on rabies and potential rabies exposures reported to King County Public Health

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Rabies testing results, 2010: A total of 68 animals from King County (KC) were tested for rabies in 2010, including 28 at the Oregon State University (OSU) Veterinary Diagnostic Laboratory (animals that exposed pets) and 40 at the Washington State Public Health Laboratory (WA PHL) (primarily animals that exposed humans). Ten animal species were tested, with the majority (66%) being bats. Testing for both animal exposures and human exposures peaked sharply in August; 60% of all tests were conducted from July - September (Figure 1).

In 2010 two bats from King County tested positive for rabies, including one big brown bat and one silver-haired bat. Both rabid bats were tested at OSU and had exposed 3 cats. All three cats remained healthy and successfully completed their post-exposure quarantine periods. One of the three cats was up-to-date on its rabies vaccinations -- it was confined in a large dog crate in the owner's home and observed for 45 days. The other two cats lived in one household; one had not been vaccinated for rabies since 2005 and it was unclear whether the other cat had ever been vaccinated. These cats were isolated in a back bedroom for 6 months. The cat's owner, a single man, came into the room daily to observe the cats' condition, provide food and change litter but was instructed not to pet or interact with the cats.

Bats are the only known reservoir of rabies in Washington State and between 5% and 10% of the 200 to 300 bats tested each year are positive for rabies. However, it is estimated that no more than 1% of bats in nature are infected with rabies, the difference being that healthy, non-rabid bats are less likely to be found on the ground or otherwise captured and tested. More than 15 species of bats live in Washington State and 9 were represented among the bats tested in KC in 2010. The big brown bat and the California myotis were the two most common species (Table 1).

Human exposures to rabid bats in recent years: In 2008 and 2009, one KC bat tested positive in each year and both had exposed humans. In 2008, a person touched a bat in the sink while washing her hands after a trip to the bathroom at 3 am (she had not turned on the lights). In the 2009 exposure, a person unpacking a suitcase after a trip from the east coast was exposed to a bat hidden inside; it was not known if the bat got into the suitcase during the trip or when the suitcase was left outside on the porch after arriving home. The two people exposed completed post-exposure prophylaxis (PEP) with rabies immune globulin and a series of rabies vaccinations and remained healthy.

Human and animal rabies cases in Washington: In Washington State the most recent cases in animals other than bats were in a llama in King County in 1994 and a cat in Walla Walla in 2002 – both were infected with bat rabies virus variant (RABVV). The most recent human cases occurred in 1995 in a 4 year old child in Lewis County¹ and in 1997 in a 64 year old man from Mason County² and were also due to a bat RABVV. In the 1995 case, a bat had been found in the child's bedroom, but because the family could find no bite wounds medical attention was not sought until signs of rabies developed about 3 weeks later. In the Mason County case, rabies was diagnosed post-mortem (the man had been hospitalized for possible tetanus); there was no known bat exposure but the victim was not interviewed specifically about bat exposure. Prior to 1950, canine rabies was not uncommon throughout the US, including in KC. The combination of rabies vaccination campaigns (often sponsored by local veterinary

associations) and municipal animal control efforts to rein in strays reduced the problem to the rarity it is today.

Imported canine rabies: There is increasing concern about the increasing number of dogs being imported into the US from countries where canine rabies is endemic. Several of these imports, including one adopted by US military personnel and brought in via “Operation Baghdad Pups” have developed rabies after arrival in the US. In 2004, an unvaccinated puppy acquired by a shelter rescue program in Puerto Rico developed rabies the day after arriving in Massachusetts; at least 6 people required post-exposure prophylaxis (PEP). Another puppy that year flew in the passenger cabin of a flight from Bangkok to LA. This puppy was diagnosed with rabies 2 days after entering the US and 12 persons required PEP.

King County has also been involved with imported rabies. In 2007, a King County veterinarian volunteering at an animal rescue in New Delhi imported two unvaccinated puppies. Two days after arrival in Seattle, one pup was observed to have non-specific clinical signs including regurgitation. Seven days after arrival, the puppy was adopted by a second veterinarian who transported it in cargo by aircraft to Juneau. Just prior to travel, a third veterinarian issued an official WA state health certificate stating the dog did not have rabies, did not originate in a rabies quarantined area, and was free of symptoms of communicable disease. The puppy was observed to be lethargic and irritable after arrival and, when evaluated by a fourth veterinarian, it was noted to have paresis and other neurologic signs. It died the next morning and rabies was confirmed by the Alaska Dept of Health’s virology lab that same day. One veterinarian was bitten by the puppy and 3 others exposed to saliva. Eight people (5 in WA, 3 in AK) received PEP. The second pup, who had been bitten by the puppy that eventually developed rabies, received surgical care for a fracture at a Seattle-area veterinary hospital before rabies was diagnosed in the first pup. Due to the risk of developing rabies, that puppy was euthanized.³

All of the above cases triggered extensive and costly public health investigations involving multiple jurisdictions. Failure to follow current dog importation regulations and the actions of the veterinarians and others involved in these cases have been scrutinized, resulting in proposed strengthening of federal animal importation regulations and other actions. The case described above involving local veterinarians also emphasizes the need for utmost vigilance in obtaining a travel history and performing a physical examination when an accredited veterinarian is completing a health certificate.

Interspecies rabies transmission: Usually interspecies transmission of rabies virus results in one fatal event and very rarely secondary transmission. Arizona, however, continues to experience an outbreak of bat RABVV that is spreading among skunks and also among foxes.⁴ In recent years a number of bat RABVV cases have been identified in foxes in southwestern Oregon although it is unknown at this point whether secondary transmission is happening. Between 2010 and March 2011, cases were identified in 9 foxes, 1 coyote and 1 goat in Josephine County.⁵ In March 2011, a dog in that area was bitten by a rabid fox. Fortunately the dog was current on its rabies vaccination, but it still has to be confined and observed for 45 days.⁶

Rabies vaccination required in KC, and soon in WA State: In King County cats, dogs and ferrets are required by KC Board of Health regulations to be vaccinated by 4 months of age, be revaccinated one year later, and immunity maintained by booster vaccinations in accordance with product labeling. A state law requiring rabies vaccination will become effective on 1/1/2012. Unfortunately, even with the legal requirements, not all pets are vaccinated or current on their rabies shots and this can lead to longer quarantine periods or even the need for euthanasia for unvaccinated pets exposed to a rabid bat.

As the weather warms up and bats emerge from hibernation, Public Health gets an increasing number of reports of potential rabies exposures to humans and animals. Veterinarians and pet owners both have the responsibility for keeping pets vaccinated and up-to-date on boosters.

Management of pets exposed to a bat: When a cat, dog or ferret has been exposed to a bat, ideally the bat is tested for rabies. However, Public Health can no longer provide testing for animal-only exposures so it is the responsibility of the pet owner and/or the veterinarian to arrange and pay for the costs of rabies testing. The test fee is \$85 at Oregon State University lab and results are available in 24-48 hours. For complete shipping instructions and the lab requisition form, see <http://www.kingcounty.gov/healthservices/health/ehs/zoonotics/testing.aspx>.

If the bat is not available for testing, the pet should be vaccinated or revaccinated for rabies as soon as possible and confined for observation for 45 days (if current on rabies vaccination) or 180 days (if not current on rabies vaccination). The KC Public Health Veterinarian (206-263-8454) should be consulted to assist in determining how to properly quarantine the pet (it can usually be done at the owner's home). Since bats often get inside houses, all cats, dogs and ferrets should receive rabies immunization, even if they are strictly indoor pets.

Human exposure to bats: If a person has been exposed to a bat, the Washington State Department of Health (WA PHL) will test the bat for rabies at no cost. If there is no human exposure, the bat can be tested at the Oregon State University (OSU) Veterinary Diagnostic Laboratory at the pet owner's expense (\$85, more details above). Veterinarians and pet owners should contact Public Health at 206-296-4774 for human bat exposures (Communicable Disease/Epidemiology Program) and the Public Health Veterinarian at 206-263-8454 for animal exposures to bats or in other circumstances where exposure to a rabid animal is suspected. Animal bites to people occurring in foreign countries where rabies may be endemic, especially those from bats, primates, dogs, cats or wild carnivores, should be reported to Public Health for assessment. After-hours consultations are available.

Rabies post-exposure prophylaxis (PEP) is administered to persons who have been exposed to a rabid or potentially rabid animal that is not available for a 10-day observation period or rabies testing. Use of the 10 day observation period to rule out rabies is considered scientifically valid only for cats, dogs, and ferrets -- not for other domestic animals or wildlife.

Post-exposure prophylaxis in 2010: In 2010, rabies PEP was recommended to 89 King County residents who were reported to Public Health with animal exposures. Of these, 51 (57%) were exposed in King County, 17 (19%) in other areas of the United States and 17 (19%) abroad. Four persons (4%) were exposed at an unknown location in the United States. Most (31/51, 61%) of the PEP cases exposed in King County were due to raccoon exposures, followed by bat exposures (20/51, 39%).

How to catch a bat, testing for rabies & related info: Additional information about bats and rabies, including how to safely catch a bat, information about rabies testing and wildlife control services that can assist with removal of bats from residences is available at <http://www.kingcounty.gov/healthservices/health/communicable/diseases/bats.aspx> and <http://www.kingcounty.gov/healthservices/health/ehs/zoonotics/testing.aspx>

Figure 1: Bats from King County tested for rabies in 2010 (n=45)

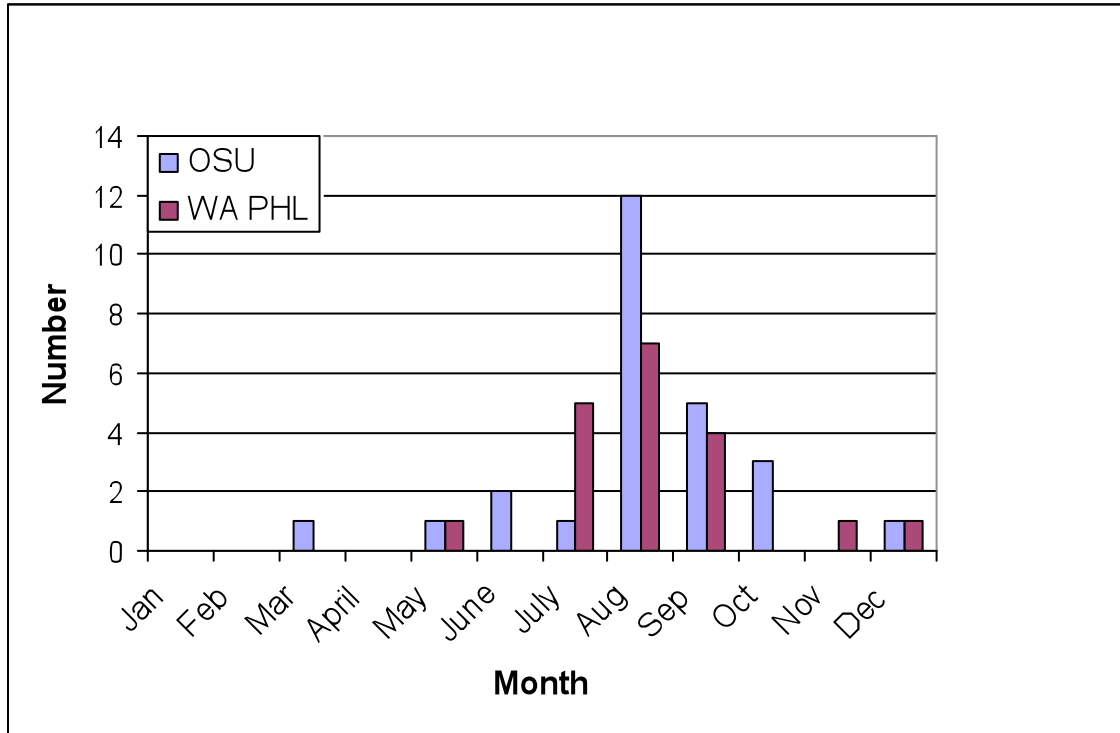


Table 1: Bat species from King County tested for rabies in 2010 (N=45)

Bat species	Number
Big brown bat (<i>Eptesicus fuscus</i>)	12
California myotis (<i>Myotis californicus</i>)	8
Little brown bat (<i>Myotis lucifugus</i>)	6
Long-legged myotis (<i>Myotis volans</i>)	2
Silver-haired bat (<i>Lasionycteris noctivagans</i>)	5
Western long-eared myotis (<i>Myotis evotis</i>)	5
Yuma myotis (<i>Myotis yumanensis</i>)	3
Western small-footed myotis (<i>Myotis ciliolabrum</i>)	2
Unknown	2

¹ MMWR 1995;44:625-27. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/00038616.htm>

² MMWR 1997;46:670-74. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/00038616.htm>

³ Castrodale L, Walker V, Baldwin J, Hofmann J, Hanlon C. Rabies in a puppy imported from India to the USA, March 2007. *Zoonoses and Public Health* 2008; 55: 427-430. . Available at <http://onlinelibrary.wiley.com/doi/10.1111/jvb.2008.55.issue-8-10/issuetoc>

⁴ Leslie MJ, Messenger S, Rohde RE, Smith J, Cheshier R, Hanlon C, Rupprecht CE. Bat-associated rabies virus in Skunks. Emerg Infect Dis. 2006;12:1274-7. Available at <http://www.cdc.gov/ncidod/eid/vol12no08/pdfs/05-1526.pdf>

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<http://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/diseases/rabies/Pages/Rabiescasesbycounty.aspx>

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<http://public.health.oregon.gov/DiseasesConditions/CommunicableDisease/Veterinarians/Pages/Dogbittenbyrabidfox.aspx>