Zoonotic Disease Newsletter

Washington State Department of Health's bulletin on zoonoses and vector-borne diseases

Fall 2008 **Volume 2, Issue 4**

In This Issue

Washington State Department of Health
Zoonotic Disease Newsletter

Subscribe
zd@doh.wa.gov

Submit articles, comments to the editor
ben.hamilton@doh.wa.gov

Despite monitoring cuts, West Nile detections increase

By Anne Duffy, Public Health Advisor, DOH Zoonotic Disease Program

This West Nile virus season exemplified "doing more with less," as our program and surveillance partners faced the realities of the stifling budget crisis. Challenged to maintain statewide surveillance, the program adopted new approaches to minimize the impact of lost funds and resources. This included using a gap analysis to determine critical areas in need of surveillance support and prioritization of resources for bird and mosquito surveillance.

We also initiated new approaches in the way we conduct West Nile virus surveillance.

- Bird surveillance went from collecting whole dead birds and submitting them for testing to just taking oral swabs of the birds and submitting samples – thus greatly reducing labor and shipping costs.
- We trained partners to identify and pool mosquito vector species for testing which increased the efficiency of processing and testing mosquitoes.
- With help from Annie Moser of Benton County Mosquito Control District, we introduced the cold-chain method to better preserve the condition of mosquito specimens from field to testing laboratory.
- We began West Nile virus surveillance later than usual (July 1) to help reserve funds for the anticipated peak season in late summer.

To improve mosquito surveillance efficiency, Dr. Liz Dykstra of the Zoonotic Disease Program, trained partners to identify key vector species for West Nile virus testing in 2008.

West Nile virus surveillance accomplished what was intended this season – to provide early warning of West Nile virus activity in localized areas. In mid-July, the first West Nile virus activity appeared at the southeastern border of Yakima County when mosquito samples tested positive for the virus. Shortly afterwards there were numerous positive horses and birds along with more positive mosquito samples.

Reports of environmental positives peaked in mid-September as predicted. From southeast Yakima County, viral activity fanned northward into adjacent areas and into Benton and Grant counties. By early September, activity spread to western Washington as detections occurred in Thurston, King, Pierce, and Lewis counties. Subsequently, two residents infected with West Nile virus were reported in mid-September; a 54-year-old Yakima County woman developed a fever, headache, and muscle aches and a 38-year-old King County man developed a more serious symptom of the disease, meningitis.

In early August, we received notification of a blood donor infected with West Nile virus. The donor, a King County resident, had traveled to eastern Washington and Oregon during the likely period of exposure. To safeguard the nation's blood supply, blood donations undergo screening for the presence of West Nile virus. This screening serves as an additional component of West Nile virus surveillance. More information about this case and viremic donor surveillance is provided in DOH's *EpiTrends* bulletin titled "West Nile Virus and Blood Donation."

West Nile virus continues on Page 2

The 2009 National West Nile Virus Conference sponsored by the AMCA and CDC is taking place in Savannah, Georgia on February 19-20. Registration information is at http://mosquito.org/wnv.

West Nile virus continued from Page 1

Overall, this season proved to be the most active since the initiation of West Nile virus surveillance in Washington in 2001. Monitoring found viral infections in 41 horses, 22 birds, and 57 mosquito samples from eight counties. Since mid-August, Washington led the nation in the number of reported infected horses. Unfortunately, 36 percent (14) of the state's infected horses with known vital status (39) either died or were euthanized. Of those horses with known vaccination history (37), 95 percent (35) were not vaccinated or did not receive a booster after initial vaccination.

In comparison to past seasons, the state clearly experienced a burst of West Nile virus activity, particularly in central eastern Washington. The West Nile Virus Web site provides surveillance maps and statistics for years 2002 through 2008 at www.doh.wa.gov/ehp/ts/Zoo/WNV/Surveillance08.html.

The consistent presence of West Nile virus over the past four years strongly indicates that the virus is now endemic to areas of Washington. Under favorable climate conditions, such as this season's wet spring followed by a warm dry summer, proliferation of mosquito vector species and viral amplification can reach critical levels that risk viral transmission to people.

Washington's future West Nile virus activity is likely to resemble that observed in neighboring states, Oregon and Idaho. It is anticipated that viral activity will intensify and expand into new areas resulting in increasing numbers of human infections. Surveillance for West Nile virus remains a fundamental key to its prevention and control.

The Zoonotic Disease Program wishes to thank our many partners—local health departments, mosquito control districts, state and tribal agencies, and volunteers—for their contributions towards the prevention and control of West Nile virus in Washington's communities. Without their active participation in surveillance, this season's timely alerts to the risk of West Nile virus in localized areas would not have been possible.

David Nash, of the Zoonotic Disease Program, swabs a tree in Tumwater that will be tested for *C. gattii*. No environmental samples have tested positive so far in 2008, but eight animals from six counties have been confirmed with *C. gattii* this year.

One person from Whatcom County was diagnosed with *C. gattii* in 2008. It was unclear where exactly the individual obtained the disease.

Fungal pathogen, *Cryptococcus gattii* is spreading

By Ron Wohrle, Environmental Health Veterinarian, WA DOH Zoonotic Disease Program

Cryptococcus gattii emerged as an environmental fungal pathogen on Vancouver Island, British Columbia (B.C.) in 1999. Most *C. gattii* cases in B.C. were in people or animals that lived in or had been to a specific region along the southeast coast of Vancouver Island.

As *C. gattii* intensified on Vancouver Island, it affected residents, visitors to the island, and animal populations. Domestic and wild animals affected included dogs, cats, llamas, horses, ferrets, pet birds, and porpoises.

Despite substantial underreporting of animal cases, published data from Vancouver Island, B.C. suggest that animal cases of *C. gattii* exceeded human cases by almost 75 percent, highlighting their value as an early indicator of disease in the environment. Additionally, animal cases began to appear 6-12 months before human cases.

A number of infections in people and animals with no travel to *C. gattii* endemic areas have since been confirmed on the B.C. mainland, in Washington, and in Oregon. This likely indicates dispersal of *C. gattii* within the Pacific Northwest.

From 1999-2006, 176 people in B.C. have been confirmed with *C. gattii* – 8 of those people died. Since 2006, 10 people in Washington have been diagnosed with *C. gattii*, although it's unclear where several of the people contracted the disease. Since 2004, 9 people in Oregon have been reported with *C. gattii*.

Cryptococcus gattii continues on Page 6

Ducks swim through an algal bloom at Cottage Lake in King County. The Department of Ecology offers pictures to help people identify algal blooms.

A sign at Liberty Lake warns people not to swim or let their animals in the water because of cyanobacteria toxins.

In animals that live more than a few hours following exposure to high levels of cyanobacteria toxin, abnormally high levels of potassium and/or low levels of glucose in blood may lead to death within a few days.

Ben Budka, King County Environmental Laboratory, takes an algae sample from Hicks Lake to be tested for toxins.

Dog deaths from cyanobacteria spurs lake monitoring

By Joan Hardy, Ph.D. Toxicologist, DOH Office of Environmental Health Assessments

Cyanobacteria, better known to lake residents as blue-green algae, are found in Washington's lakes and ponds with increasing frequency. Blue-green blooms are often mistaken for paint spills because they may look like bright green paint floating in scum on the water's surface.

Often smelly and unsightly when they decompose, some species of cyanobacteria also produce toxins. Scientists do not know what triggers toxin production by cyanobacteria. Not all species produce toxins. Even known toxin producers do not produce toxins all the time. Only laboratory tests can confirm whether a bloom is toxic or non-toxic.

The most common cyanobacterial toxins in temperate water bodies are microcystins, which affect the liver, and anatoxin-a, which affects the nervous system. Both toxins can harm people, pets, and livestock as well as fish and wildlife. Symptoms in people may include stomach pains, vomiting, diarrhea, skin rashes, sore throat, ear and eye irritation, fevers, blistered mouth, or nerve and liver damage. Cyanobacterial toxins may also have long-term health effects, including liver cancer promotion and possibly neurological diseases.

So just how risky are blue-green blooms? Since cyanobacterial toxins can be lethal to animals even in small amounts, caution should always be taken when a bloom occurs. As cells die, toxins are released into surrounding waters. Some toxins, such as microcystins, are very stable and can remain in the water for days or weeks after the bloom has disappeared.

In October 2008, two Labrador retrievers died after drinking water from Liberty Lake, near Spokane, Washington. Anatoxin-a, a neurotoxin, is suspected in both cases. Earlier in the month, three dogs were sickened and two died after swimming in Newman Lake, also near Spokane. While toxic cyanobacteria were initially suspected, one of the dog's symptoms could possibly be linked to leptospirosis.

In 2007, veterinarians reported that two dogs died in separate incidents after swimming in Potholes Lake in Grant County during a cyanobacterial bloom. In December of that same year, a dog died after swimming during a cyanobacterial bloom in American Lake, Pierce County. In 2006, two dogs died after swimming in Anderson Lake, Jefferson County. Toxin levels in Anderson Lake were high at the time that the dogs died. Previously, other pets have died after being exposed to toxic blooms in Lake Steilacoom and other water bodies.

The Washington State Department of Ecology in 2007 began a program that offers freshwater algae identification and toxicity testing. The department contracts with a laboratory to identify algae species to genus level and to test for cyanobacterial toxins. Concerned observers may contact Ecology's Tricia Shoblom at 425-649-7288 to report a suspected harmful blue-green bloom occurring in a lake. Local health jurisdictions or other agency staff will sample the lake for possible toxins. Results of toxicity tests are reported to the sampler, local health jurisdiction, and are posted on Ecology's online database at https://fortress.wa.gov/ecy/toxicalgae/InternetDefault.aspx.

Earlier this year, Washington Department of Health received a grant from the CDC to track incidences of harmful algal blooms. Staff from King, Pierce, and Snohomish counties will monitor 30 lakes to determine the number of bloom and toxic bloom occurrences. In years two and three of the 5-year grant, samples will be tested for saxitoxins and cylindrospermopsin, in addition to microcystins and anatoxin-a. The CDC is interested in investigating all reports of animal and pet illnesses related to harmful algal blooms. To report an illness, contact Joan Hardy of the Department of Health at 360-236-3173 or toll free at 1-877-485-7316.

For more information about cyanobacteria, see the Department of Health Web site at www.doh.wa.gov/ehp/algae/default.htm and the Department of Ecology site at www.ecy.wa.gov/programs/wq/plants/algae/publichealth/index.html.

Workgroup begins revision of state's zoonoses rules

An interagency workgroup has begun work on revising two Washington Administrative Codes (WACs). The workgroup is comprised of a variety of zoonotic disease and environmental health professionals representing state agencies, local health jurisdictions, universities, and private institutions.

The rules being revised include "Animals, Birds, Pets – Measures to Prevent Human Disease" (WAC 246-100-191), and "Birds – Measures to Prevent Psittacosis" (WAC 246-100-201).

The purpose of the revision is to update the existing rules to reflect current standards of practice for prevention and control of human cases of psittacosis, rabies, and other diseases transmissible from animals to humans. The rule revision will focus on environmental factors and controls rather than human case tracking and management.

More information about the rule revision process, including timelines and supporting documents, can be found at www.doh.wa.gov/ehp/ts/Zoo/rulerrevision.html.

CDC signs *North American Rabies Management Plan*

Adapted from CDC In the News, October 8, 2008

The CDC and USDA Animal and Plant Health Inspection Service recently signed the first *North American Rabies Management Plan* with Canadian and Mexican authorities at the 19th International Conference on Rabies in the Americas in Atlanta, Georgia.

The *North American Rabies Management Plan* establishes a framework and forum for constructive interaction among the countries to build long-term wildlife rabies management goals. The plan calls for annual meetings between the three countries to share information about oral rabies vaccine research, wildlife management, population control, and surveillance techniques.

Collaboration between the three countries already is successful in controlling rabies in wildlife. In recent years, U.S. and Mexican officials have also worked to successfully eliminate canine rabies in coyotes in south Texas. This resulted in the 2007 announcement that canine rabies (the strain which circulates from dog-to-dog globally) had been eliminated in the United States.

"The elimination of dog-to-dog transmission of rabies does not mean that people in the U.S. can stop vaccinating their pets against rabies," warns Dr. Charles Rupprecht, Chief of CDC's Rabies Program. "Rabies is ever-present in wildlife and can be transmitted to dogs or other pets, or imported to the US through movement of animals."

Read the complete news article at www.cdc.gov/news/2008/10/rabies.html.

Scary…But True Stories

About 90 elementary school students in Montana started a series of post-exposure rabies shots after a mom brought in a dead bat and let kids touch it, reported the Associated Press in October. The mom offered each student who touched the bat a sanitary wipe. The dead bat was later tested and confirmed to be infected with rabies. The school said it will use their liability insurance to pay up to $70,000 for the anti-rabies shots, but the overall cost could be more than $150,000.

An Arizona jogger was attacked by a fox, ran a mile with the animal clamped on her arm, and then drove herself to the hospital, the Associated Press reported in early November. The woman wanted the fox tested for rabies, so she ran back to her car (with it still biting her arm), pried it off, tossed it into the trunk of her car, and drove to the hospital. The fox later bit an animal control officer, so he, and the woman, both received rabies post-exposure shots.

Dogs can get leptospirosis by swimming in lakes and ponds. People can get leptospirosis from dogs, but this is rare. Frequently asked questions about canine leptospirosis are available at www.doh.wa.gov/ehp/ts/zoo.htm.

Canine leptospirosis concerns rise in the fall

By Liz Dykstra, Ph.D. Entomologist & Acting Manager, WA DOH Zoonotic Disease Program

The arrival of autumn brings increased risk of canine leptospirosis for Washington dogs. Leptospirosis is caused by spiral-shaped bacteria known as a leptospire. During the colder months (October through February) the Zoonotic Disease Program receives an average of 6-7 case reports of leptospirosis in dogs per month.

All dog breeds are susceptible to leptospirosis, but the majority of cases reported to the Zoonotic Disease Program have occurred among dog breeds in the sporting and herding groups, as defined by the American Kennel Club. The majority of cases in Washington have been reported from the western side of the state. However, leptospirosis can also occur in eastern Washington.

Leptospirosis is maintained in the environment by raccoons and rodents. Dogs can become exposed to the leptospires through contaminated water or urine. Pet food and water bowls left outside can be contaminated by raccoons and rodents.

Most cases of canine leptospirosis are asymptomatic or mild, but severe cases can be fatal, with an overall fatality rate ranging from 1-5%. Severe cases of leptospirosis are treated with antibiotics. Common clinical signs include vomiting, lethargy or depression, abdominal discomfort, and fever.

Canine leptospirosis is a reportable disease in Washington. Veterinarians and local health officials should report all cases of canine leptospirosis to the Zoonotic Disease Program by calling 360-236-3388 or by submitting a completed case report. Case report forms are available at www.doh.wa.gov/ehp/ts/zoo.htm.

Kids and pets: advice for staying healthy and happy

Adapted from CDC Online Newsroom, October 6, 2008

Parents, pediatricians, and veterinarians are cautioned to be aware of the risks that exotic animals and pets can pose to children. A study released in *Pediatrics*' October issue outlines disease that can be transmitted to children when they come into contact with reptiles, rodents, mammals, birds, amphibians, non-human primates, and fish.

Many families own non-traditional pets, and children may encounter animals at petting zoos, farms, and pet stores. Parents are urged to talk with their family veterinarian or pediatrician to learn how to ensure that their child's experience with animals is both safe and enjoyable. Some diseases and injuries associated with non-traditional pets and wildlife include:

Reptiles (Such as turtles, lizards, snakes)	*Salmonella* infection
Rodents (Such as hamsters, rats, mice, gerbils, guinea pigs, squirrels)	*Salmonella* infection, plague, Lymphocytic Choriomeningitis Virus
Fish	*Mycobacterium, Aeromonas, Vibrio, Salmonella*, and *Streptococcus* infections
Cattle	*E. coli* infection
Goats	*Cryptosporidium* and *E. coli* infections, rabies
Baby poultry (Such as chicks, ducklings)	*Salmonella* infection
Ferrets	Bite injuries, rabies

For an expanded list of animals, diseases, and prevention advice, read the *Pediatrics*' article at http://pediatrics.aappublications.org/cgi/content/full/122/4/876/T2.

Zoonotic Disease Program

Acting Manager
Dr. Liz Dykstra
(360) 236-3388
elizabeth.dykstra@doh.wa.gov

Environmental Health Veterinarian
Dr. Ron Wohrle
(360) 236-3369
ron.wohrle@doh.wa.gov

Program Staff
Anne Duffy
(360) 236-3372
anne.duffy@doh.wa.gov

Jo Marie Brauner
(360) 236-3064
jomarie.brauner@doh.wa.gov

David Nash
(360) 236-3362
david.nash@doh.wa.gov

Administrative Support
Cyndi Free
(360) 236-3384
cyndi.free@doh.wa.gov

ZD Program Web site
www.doh.wa.gov/ehp/ts/zoo.htm

Newsletter Reviewers
Jo Marie Brauner
Anne Duffy
Liz Dykstra
Cyndi Free
Ben Hamilton
Nancy Napolilli
David Nash
Ron Wohrle

Cryptococcus gattii continued from Page 2

The fungal pathogen is acquired by breathing in airborne spores and may cause lung-related, brain, and spinal cord disease. Activities that disturb the fungal spores in soil or on trees may increase the likelihood of exposure. Disease acquisition may also depend on host factors, including underlying lung conditions and oral steroid use. Unlike other *Cryptococcus* species, *C. gattii* commonly causes disease in people or animals that are otherwise healthy with a normal immune response.

Prior to the Vancouver Island outbreak, *C. gattii* was thought to be endemic to tropical regions in Australia, South America, Mexico, and California, and was associated with certain species of eucalyptus trees. An environmental investigation on Vancouver Island documented *C. gattii* spores on a variety of native trees and in soil, water (fresh and salt), and air.

The biogeoclimatic (Coastal Douglas Fir and Coastal Western Hemlock) zones located along the eastern edge of Vancouver Island are characterized by warm, dry summers, and mild, wet winters, and extend into the southern Gulf Islands and the B.C. lower mainland. Climates with comparable rainfall and temperature extend south into parts of Washington and Oregon. Plant communities similar to those in B.C. have been identified in the San Juan Islands and Puget Trough of Washington and the Willamette Valley in Oregon. These ecologic likenesses to B.C. support the idea that *C. gattii* may colonize niche areas of the U.S. Pacific Northwest.

Environmental surveillance in Washington was conducted in 2005. Just over 50 samples were collected within 6 miles of the B.C. border. Two samples, including a single soil sample and a swab of a fence in Whatcom County were positive. Both of these samples were collected near the residences of two cats diagnosed with *C. gattii*.

Recognizing the importance of this emerging fungal pathogen in the Pacific Northwest, the CDC facilitated the formation of the West Coast *Cryptococcus gattii* Public Health Workgroup. This group consists of various federal, international (British Columbia), state, and local public health practitioners, laboratorians, and academics from six western states (Washington, Oregon, California, Idaho, Montana, and Alaska). The workgroup's first meeting, co-sponsored by the Washington State Department of Health and the CDC, was held in Shoreline in November. In addition to facilitating this workgroup to coordinate information sharing among the various agencies, CDC awarded funding to Washington and Oregon to enhance surveillance efforts.

CDC funding for *C. gattii* environmental and animal surveillance in Washington has enabled the Zoonotic Disease Program staff to conduct four environmental investigations in 2008. Environmental sampling was done near sites of animal infections. The funding was also used to aid veterinary pathologists to distinguish *C. gattii* from or other species of *Cryptococcus*. So far in 2008, there have been eight animals confirmed with *C. gattii* and no positive environmental samples found.

Veterinary reporting is an important part of surveillance. Veterinarians are often the first to detect unusual pathogens that can be shared by humans and animals. Both animal and human infections with *C. gattii* are reportable in Washington as a rare disease of public health significance. See veterinarian notifiable conditions at www.doh.wa.gov/notify/other/veterinaryposter.pdf.

The clinical presentation of *C. gattii* in animals may include: sudden onset blindness, seizures, other signs of central nervous system involvement, respiratory signs (runny eyes, nostrils, enlarged lymph nodes), and nodules involving the skin. Inhalation of *C. gattii* is thought to be followed by nasal cavity colonization that may lead to systemic illness. Cats are reportedly four times more likely to be clinically affected based on the B.C. outbreak information. Clinical features in dogs and cats in the outbreak included neurological signs, skin lesions, and respiratory signs. In B.C., 60 percent of companion animal cases showed neurological symptoms.

For more information about the *C. gattii* surveillance project in Washington contact Ron Wohrle at 360-236-3369.