



EPIDEMIOLOGY & DISEASE CONTROL

Vector-Borne and Zoonotic Disease Newsletter
2003-2005 Highlights



May 2006 Issue

WEST NILE VIRUS IN ARIZONA, 2003-2005:

Over the last few years, the biggest news for the Vector-Borne and Zoonotic Disease Program (VBZD) in Arizona has certainly been the introduction of West Nile Virus (WNV). Since being detected in a batch of mosquitoes collected in the southeastern part of the state in late July, 2003, WNV has been found in virtually all corners of the state and is now considered endemic. Over 500 human cases have been detected in Arizona with the majority of these occurring in 2004. Unfortunately, WNV has frequently exceeded early labeling as a "mild flu-like condition" and many individuals have experienced lengthy, debilitating illnesses. Twenty-four people have died from WNV infections in Arizona. The good news is that WNV is preventable by avoiding the bites of mosquitoes that spread the disease. DEET, Picaridin and other commercial insect repellent formulations are effective when used according to label instructions. Other self-protecting behaviors, such as avoiding outdoor activities during the evening hours and wearing long sleeves are very helpful. Elimination of standing water around the home and proper maintenance of swimming pools are critical steps in stopping mosquitoes and the transmission of the virus. Local health departments and a variety of other agencies have worked tirelessly around the state trapping mosquitoes to identify "hot spots" and taking measures to eliminate and/or treat breeding sites. Epidemiologists across Arizona have logged countless hours investigating human illness and counseling patients. Now that WNV is endemic in Arizona, it is anticipated that we will see year-to-year fluctuations in virus activity. ADHS and its surveillance partners are committed to "fight the good fight" in assessing and responding to WNV as it develops in our state.



ROCKY MTN SPOTTED FEVER IN ARIZONA, 2003-

2005: Rocky Mountain Spotted Fever (RMSF) has emerged as a major concern in portions of Arizona. Prior to 2004, only eight cases of RMSF had been recorded in the state. In 2004 alone, 15 cases were reported. Another 13 were added in 2005. All of the 2004-2005 cases occurred in mountainous east-central Arizona and appear to be associated with the brown dog tick, *Rhipicephalus sanguineus*, a species not previously known to be a vector in the U.S. It is thought that the brown dog tick, while not an efficient vector, can transmit RMSF under certain conditions, namely when the number of ticks in a community is large and dogs are allowed to roam freely. Therefore, controlling ticks on dogs and around the home as well as enforcement of animal control regulations are essential steps in preventing RMSF. A very unfortunate aspect of the current outbreak is that it has disproportionately affected children. From 2003-2005, five individuals have died from RMSF infections. RMSF, caused by *Rickettsia rickettsii* bacteria, is an acute febrile illness typically marked by the sudden onset of moderate to high fever with a rash forming a few days later on the extremities and spreading to the palms and soles and then the torso. Severe headache and muscle aches are also common symptoms. In some cases, infection with *R. rickettsii* does not produce classic symptoms. Lack of appearance of rash and/or other typical symptoms can delay diagnosis and treatment. A sweeping multi-agency RMSF response effort was undertaken in 2005 and more work is planned for 2006. Because of this recent activity, RMSF should be included in the differential diagnosis for Arizona care providers seeing patients with unexplained rash and fever illnesses. Ticks removed from patients may be submitted to ADHS-Vector for identification.



HANTAVIRUS IN ARIZONA, 2003-2005:

Hantavirus activity appears to be on the upswing throughout the American Southwest. In Arizona, two cases were reported in 2004 and an additional five were noted in 2005. These cases were in Maricopa County and in the northeastern portion of the state. Three of these individuals died as a result of their infections. Unfortunately, the increase in Hantavirus appears to be a continuing trend, with four cases under investigation in the early part of 2006. Therefore, it is ever more critical to effectively communicate to all Arizonans the importance of performing “safe” cleanups when dealing with areas with possible rodent activity. Since its first detection in the early 1990s, this particular strain of Hantavirus (known as *Sin Nombre*) has resulted in 48 documented cases of infection in Arizona with 15 (31%) of these being fatal.

PLAGUE IN ARIZONA, 2003-2005:

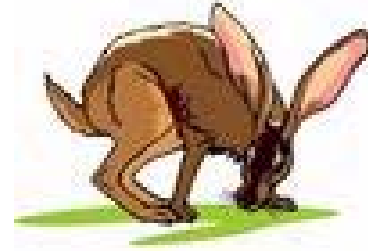
No humans were diagnosed with plague in this period. One plague-positive house cat was found in the Winona area (Coconino County) in 2005. This finding serves as a reminder that plague remains endemic in higher elevation areas of the state. Discovery of evidence of plague activity, such as a prairie dog die-off, should be brought to the attention of your local and state health departments right away.



TULAREMIA IN ARIZONA, 2003-2005:

The state has averaged one case of tularemia per year over the last three years. One case in 2003 is thought to have been acquired from deer fly bites. Cases in 2005 occurred in two Coconino County family members who both had contact with a rabbit carcass. Tularemia, also known as rabbit fever, is a potentially serious bacterial disease most commonly associated with handling rabbits, although bites from infected ticks and deer flies are also known to be a source of infection. Tularemia is part of the reason why we recommend that hunters wear rubber gloves while

field-dressing game. Animal surveillance efforts found two tularemia-positive animals in 2005 (a rabbit and a domestic cat, both in Yavapai County). In 2006, a cat with tularemia was reported in the Show Low area.



EXOTIC DISEASES IN ARIZONA, 2003-2005:

Arizona has seen a rise in the number of dengue fever cases, which is not surprising given that many parts of the world are experiencing major epidemics. Five cases were detected in 2005 compared with one each in 2003 and 2004. Dengue is not endemic in Arizona and all of our cases have been found in residents with exposure out of the country. Six of the seven cases reported from 2003-2005 had travel histories in Central America. An ongoing area of concern is the fact that the principal vector of dengue, *Aedes aegypti* (the Yellow Fever Mosquito), is found in many parts of the state and its range seems to be increasing. With the vector already in place, an introduction of the virus into the local population could have serious consequences.



PETTING ZOO SAFETY:

As with all situations that bring humans and animals together, petting zoos, if not managed properly, can be a source of illness in people. Historically, enteric bacteria such as *Salmonella* and *Campylobacter* and the protozoan parasite *Cryptosporidium* have been the primary agents responsible for such illnesses. Recently, Shiga toxin-producing *Escherichia coli* such as *E. coli* 0157:H7 have been associated with petting zoos and human illness. Outbreaks in Florida and North Carolina have been documented and received a great deal of media attention. Shiga toxin-producing *E. coli* can cause severe gastrointestinal illness and, in small children, can lead to a condition known as hemolytic uremic syndrome (HUS), which can cause organ failure and death. In 2005, ADHS investigated a possible connection

between two children diagnosed with *E. coli* infections and a petting zoo in central Arizona. Only one of the children was thought to have direct contact with the animals at the zoo, but both played in a water park area adjacent to and downhill from the petting zoo. Samples were taken and 15 of the 25 animals at this facility were found to be infected with *E. coli* 0157:H7. Pulsed-field gel electrophoresis conducted at the Arizona State Public Health Laboratory matched the *E. coli* strains confirming the link between the petting zoo animals and the human patients. The petting zoo was closed, the animals were removed and treated with antibiotics, and the soil was decontaminated. Subsequent soil sampling was negative for *E. coli*. ADHS developed and distributed educational packets to petting zoos statewide prior to this investigation. The packets included color, laminated signs giving petting zoo patrons instructions on hand washing and other hygienic behaviors. Additionally, sanitary guidelines were issued to petting zoo operators, fair associations and other interested parties throughout the state. Copies of the guidelines and signage can be obtained by contacting our office.

RABIES IN ARIZONA, 2003-2005:

A network of individuals and agencies around the state has long yielded a solid rabies surveillance effort in Arizona. Historically, rabies activity in Arizona has had its share of highs and lows and the period from 2003 to 2005 is no exception. The years 2003 and 2004 were typical, with 75 (3.5% positive) and 120 (5.2% positive) animal cases detected, respectively. By contrast, 2005 saw an unprecedented rise in the number, with 169 (6.8% positive) cases. One explanation for the record high was an intense epizootic of skunk rabies in Pima County during the first half of the year. Also of note for 2005, the Flagstaff area experienced a return of big brown bat variant rabies in skunks and other animals. Prior to 2001, bats were the only rabid animals found in the Flagstaff area. In 2001, a rabies epizootic in skunks occurred, and the circulating virus was typed as Big Brown Bat variant. Nineteen rabid skunks were reported in the Flagstaff area during 2001.



In 2001, a collaborative program to trap, vaccinate (by injection) and release (TVR) local skunks was implemented with successful results. No new skunk cases were seen for the next few years. In August 2004, however, rabid skunks were once again reported in the area. With the recent development of a new bait suitable for oral rabies vaccination (ORV) of skunks, an ORV program was initiated in Flagstaff in April, 2005, with limited success. A rabid skunk, fox and housecat were reported subsequently, all with the same big brown bat variant. In April, 2006, ORV baits were distributed again in Flagstaff, over a wider area.

In addition to the rabid cat in Flagstaff, two cats in Santa Cruz County were also confirmed to be infected with rabies, one in Rio Rico in August, 2005 (gray fox variant) and one in January, 2006, in Amado (skunk variant). Rabies in domesticated cats had not been reported in Arizona for 15 years. Three rabid housecats reported within six months serve as a reminder of the importance of proper vaccination of household pets. The county and species breakdown of 2005 rabies finds can be seen in the following table:



County	Lab Confirmed Rabies Positive Animals, 2005					# Tested, 2005
	Bat	Skunk	Fox	Other	Total	
Apache	0	0	0	0	0	3
Cochise	6	5	2	0	13	140
Coconino	1	1	1	Cat – 1	4	261
Gila	1	0	1	0	2	70
Graham	1	0	1	0	2	13
Greenlee	2	0	0	0	2	6
La Paz	1	0	0	0	1	5
Maricopa	11	0	0	Bobcat – 1	12	547
Mohave	0	0	0	0	0	24
Navajo	0	0	0	0	0	9
Pima	48	55	3	Raccoon – 1	107	1071
Pinal	4	0	2	Bobcat – 1	7	93
Santa Cruz	3	6	1	Cat – 1 Coyote – 1	12	116
Yavapai	6	0	1	0	7	99
Yuma	0	0	0	0	0	24
TOTAL	84	67	12	6	169	2481

Notes: The Coconino County skunk, fox and cat were infected with the Big Brown Bat variant, the same variant that was responsible for the 2001 outbreak and 2004 reoccurrence of rabies in skunks in the Flagstaff area. Both bobcats, the coyote and the Santa Cruz cat were infected with the Arizona Gray Fox variant.

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