

{ Summary of West Nile Virus Activity, 2004 }

2004 Surveillance Findings

Progressing westward since its introduction in 1999, **West Nile (WN)** virus has now established itself as an enzootic and endemic mosquito-borne disease across most of the U.S. Since 2002, the greatest disease burden has occurred in the western part of the country. In 2004, a total of **2,539** cases of WN disease and 100 associated deaths were reported to the Centers for Disease Control and Prevention (CDC) by 40 states. States most affected by this year's epidemic included California (**779 cases**), Arizona (**391**) and Colorado (**291**).

The first surveillance indicator of WN virus activity in Oklahoma in 2004 was an equine case from Oklahoma County with a symptom onset of May 20. Consistent with previous years, intensified WN virus transmission was seen throughout the state as indicated by numerous avian infections that peaked bimodally in the latter parts of July and September. **Thirty-two** horses were diagnosed with WN disease in the state, which was markedly decreased compared to the previous two seasons. The majority of equine cases occurred in late September and October.

A total of **22** Oklahomans were identified as probable or confirmed cases of acute WN Fever or neuroinvasive disease during the 2004 season. These cases were distributed in **12** counties with geographic clustering in the northeast, panhandle, and north central parts of the state. Counties with the highest incidence rates per 100,000 population included Texas (**14.92**), Nowata (**9.46**), Haskell (**8.48**), Kingfisher (**7.18**) and Choctaw (**6.52**). Symptom onset dates ranged from July 25 to October 10, 2004. Sixty-eight percent of the case patients were male; median age of all patients was **67 years** (range: 32-87 years). A total of **three** WN-associated fatalities were reported in residents from Nowata, Oklahoma, and Tulsa counties representing a statewide case fatality rate of **13.6%**. Prominent reported symptoms included **fever (86.4%), headache (61.9%), muscle weakness (59.1%), confusion (54.5%), disorientation (45.5%), vertigo (45%)** and **neck stiffness or rigidity (40%)**. **Seven** Oklahoma blood donors tested positive for WN viremia by routine blood donor screening. Only one WN virus test-positive donor developed symptoms of WN disease. Most cases reported exposure to mosquitoes (**64.7%**) within two weeks of symptom

onset. Exposure to mosquitoes occurred most frequently while performing everyday peridomestic activities such as doing yard work, working on farms, and spending leisure time on porches or patios.

WN virus poses a potential risk to people across Oklahoma, especially those in the northeastern and northwestern parts of the state. With no effective treatment or vaccine yet available, **prevention hinges on application of DEET-containing repellents when engaging in outdoor activities during WN season** (July-October). Oklahomans are also encouraged to **eliminate or treat standing water around the home** to reduce mosquito breeding sites and to take extra care to **use repellent and protective clothing during the evening and early morning hours** when vector mosquitoes are most active.

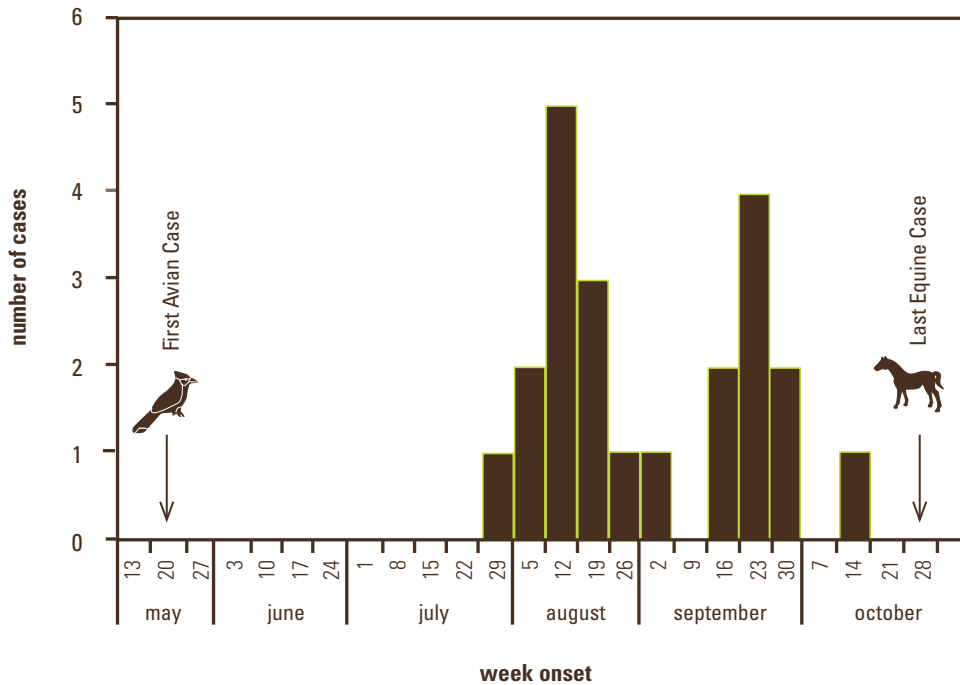
2005 Surveillance and Laboratory Testing

In 2005, the Oklahoma State Department of Health (OSDH) will cease routine testing of birds since WN has been established as an endemic mosquito-borne disease in all parts of the state. Three years of surveillance activities have consistently demonstrated that May through November comprise the WN season in our state with the greatest period of risk for human infections being July through October. Human WN testing will continue to be offered free of charge at the **OSDH Public Health Laboratory (PHL)**. The PHL performs **IgM-capture ELISA**, the most sensitive screening test for acute infections, on **cerebrospinal fluid (CSF)** and serum. **Polymerase chain reaction (PCR)** testing is also available for CSF specimens. Oklahoma physicians are asked to submit specimens for WN virus testing on patients with potential mosquito exposure and compatible clinical presentations for either WN Fever or WN meningoencephalitis. Physicians who submit a CSF specimen should also submit a serum specimen (for IgM ELISA) from the case patient due to the lower sensitivity of the PCR test. WNV resource and testing information can be accessed on-line at << <http://www.health.state.ok.us/program/cdd/wnv/index.html>>>.

WN Tables listed on page five.

*prepared by **Renee Powell**, M.P.H. Epidemiologist, CDD & **Kristy Bradley**, D.M.V., M.P.H.

Human WNV Cases in Oklahoma by Week of Onset; 2004



{2004 State Rabies Summary}

Animal Rabies

Animal rabies cases in Oklahoma declined in 2004, following an 11-year high reported in 2003 [see rabies graph p.3]. A total of **113** cases of animal rabies were laboratory-confirmed in 2004, compared to **204** documented the previous year. Rabid animals identified in 2004 included **80 skunks, 9 cows, 8 cats, 6 dogs, 3 bats, 3 horses, 1 deer, 1 fox, 1 goat, and 1 sheep**. Skunks typically account for greater than 70% of animals testing positive in the state, and this year was no exception. **Skunks are the major animal reservoir of rabies in Oklahoma.** When the skunk population increases (approximately every 6 years), a rise in the number of animal rabies cases usually follows.

Rabies was confirmed in animals from **47** counties in Oklahoma. Several counties had greater than five cases including Oklahoma County, which led the way with eight confirmed cases. Human exposure was determined in **21.4%** of the cases causing at least **59** persons to seek rabies post exposure prophylaxis (PEP). Pet or domestic animal exposure was reported in **68%** of cases. A sum of **159** owned animals (range 1-10 animals/case) were considered exposed to rabies by case risk assessments performed by Communicable Disease Division (CDD) staff epidemiologists. **Ninety-three (58%)** of the exposed pets were euthanized to prevent the development of rabies. This action was required primarily as a result of negligent pet owners not having their pets vaccinated against rabies.

Oklahoma law requires all dogs, cats, or ferrets be vaccinated against rabies by the time the animal is four months of age and at regular intervals thereafter depending on the vaccine used. When a currently vaccinated pet has exposure to a rabid animal, the exposed pet needs only to receive a rabies vaccine booster and be closely observed for 45 days.

Human Rabies

On June 30, 2004, the OSDH was notified by the Centers for Disease Control and Prevention (CDC) that an Oklahoma resident was one of three organ recipients confirmed to have died of rabies. Upon retrospective review of the case, the patient was readmitted to a Texas hospital 21 days after receiving a liver transplant with symptoms of tremors, lethargy, and anorexia. His neurologic status continued to deteriorate until his death. Ultimately, a total of four transplant recipients and the donor were determined to have died of rabies¹. The organ donor was an Arkansas man who had been bitten by a bat². This was a historic event because it marked the **first time that rabies was transmitted person-to-person by solid organ transplantation.** The OSDH CDD initiated a public health investigation to identify contacts to the Oklahoma case, assess exposure risks, and provide recommendations for rabies post exposure prophylaxis (PEP). **Two** familial contacts were determined to have had saliva contact and received PEP.

2004 State Rabies Summary cont...

Human rabies deaths are rare in the U.S., as an average of 1-2 cases are reported annually³. Most of the contemporary human rabies cases in the U.S. have been caused by bat variants of the virus. Recent epidemiological data suggests that transmission of rabies virus may occur from minor or seemingly insignificant physical contact with bats. Therefore, rabies PEP is recommended for all persons with a bite, scratch, or mucous membrane exposure to a bat, unless the bat is available for testing and tests negative for rabies. The last reported Oklahoma rabies death occurred in 1981, which resulted from a skunk bite that was not reported by the victim.

Rabies and Animal Bites

Animal bites, particularly dog bites, are a huge public health problem. In 1994, the most recent year published data are available, an estimated **47 million** dog bites led approximately **800,000** persons to seek medical attention in the United States⁴. Animals bite to express aggression, fear, territoriality, possession, or a need to escape. Therefore, an animal bite does not necessarily equal a rabies exposure. From 1980 to 2004, a total of **45,533** dogs and cats were tested for rabies in Oklahoma, of which only **242** (0.5%) were positive. Physicians must individually evaluate human exposure to a potentially rabid animal. The following factors should always be evaluated and communicated with the patient before specific antirabies treatment is initiated:

- 1 type of exposure, (bite vs. non-bite),
- 2 type of animal species involved,
- 3 vaccination status of the animal,
- 4 circumstances leading to the bite or other exposure, and
- 5 presence of rabies in the region.

Due to periodic nationwide shortages of human rabies immune globulin, the potential for adverse reactions to immunizations, and the costs of treatment, rabies biologics should be used appropriately and judiciously. Currently, only one company is producing rabies vaccine available for human use in the United States. The OSDH Epidemiologist-On-Call is available for consultation at (405) 271-4060 [24/7 number].

*prepared by **John Bos**, M.P.H. Epidemiologist, CDD

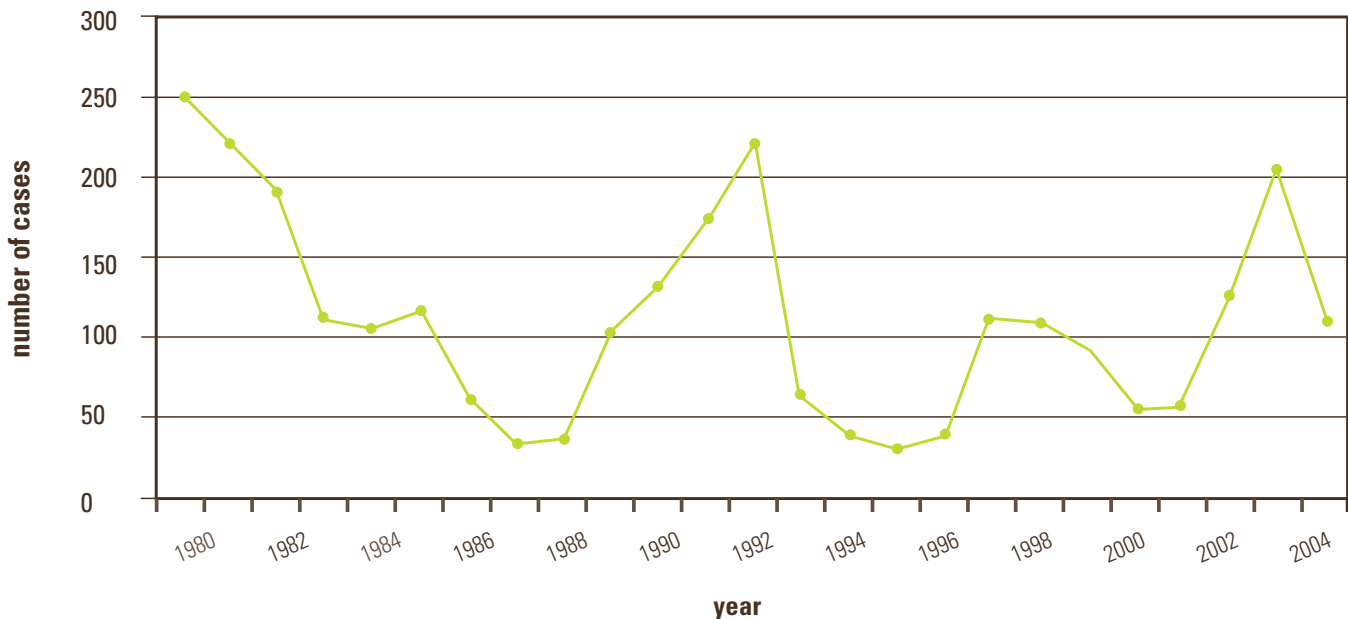
1 CDC. Investigation of rabies infections in organ donor and transplant recipients - Alabama, Arkansas, Oklahoma, and Texas, 2004. MMWR 2004;53:586-9.

2 CDC. Update: Investigation of rabies infections in organ donor and transplant recipients - Alabama, Arkansas, Oklahoma, and Texas, 2004. MMWR 2004;615-616.

3 CDC Rabies Web Site, <http://www.cdc.gov/ncidod/dvrd/rabies/>

4 CDC. Nonfatal Dog Bite - Related Injuries Treated in Hospital Emergency Departments - United States, 2001. MMWR 2003;52:605-610.

Animal Rabies in Oklahoma, 1980 - 2004



{FACT SHEET: bacterial skin infections}

How do people get skin infections?

Many different types of bacteria are commonly found on the skin or in the nose of healthy people. These bacteria may cause an infection when a break in the skin gives the bacteria a place to grow (such as a scratch or insect bite). Common ones are *Staphylococcus* (also known as “staph”), *Streptococcus*, and *Pseudomonas*.

How to prevent skin infections:

When you first notice a break in your skin, wash it with soap and running water, and put a clean, dry bandage over it. Change the bandage if it becomes wet, dirty or loose. Keeping your skin clean will help prevent development of skin infections.

What do skin infections look like?

Skin infections may appear in many forms, most involving redness, tenderness and often the presence of a sore with pus, crust or scab. They can occur beneath the skin’s surface, in a hair follicle, or in a cut or scratch.

How should skin infections be treated?

Most skin infections heal with basic wound care. If infections do not improve, a healthcare provider may drain the pus and/or prescribe antibiotics. If you are given antibiotics, it is important to take them exactly as prescribed. Incorrect use of antibiotics can cause bacteria to become drug-resistant. When drug-resistant bacteria cause infections, fewer antibiotics are effective and they are usually more expensive.

How serious are skin infections?

Skin infections are usually mild. Rarely the bacteria can cause severe illness even when treated quickly and even cause severe diseases or death. A healthcare provider should examine skin infections that are not improving.

How can skin infections spread from person to person?

Skin infections are almost always spread by direct contact with an infected person. Touching surfaces that have been contaminated by a person with a bacterial infection can also spread infection. They are not spread through the air.

“ Performing **careful, frequent**
HAND HYGIENE
is the most **important** action you
can take to **prevent** the spread
of infection! ”

What can be done to prevent spread of skin infections to others?

Prevent spreading skin infections to others near you by following these steps:

- 1 Keep skin infection sites clean and covered with clean, dry bandages at all times, especially if pus or drainage is present.
- 2 Wash your hands often, especially after touching the area of infected skin. Advise your family and others to wash their hands more often, especially if they touched the affected area or any items that had contact with it.
- 3 Wear disposable latex or vinyl gloves if you are caring for a skin infection other than your own. Immediately remove and dispose of gloves, then wash your hands with soap and water, or use an alcohol-based hand rub.
- 4 Do not share personal items such as towels, washcloths, razor, clothing, or uniforms that may have had contact with pus or drainage.
- 5 Wash soiled bed linens and clothes with hot water (at least 160° F), laundry detergent and (when possible) bleach and dry on the hottest dryer setting.
- 6 Put all bandages or items with any pus or drainage (including blood and nasal discharge) immediately into the trash.
- 7 Clean frequently touched surfaces with a household disinfectant or with a bleach solution (1 tablespoon bleach in 1 quart of water), which must be mixed daily.
- 8 Tell healthcare providers treating you for any reason about your skin infection.



Geographic Distribution of Human WN Cases*

2004		Counties with Highest West Nile Disease Incidence Rates:	
County	Rate	County	02-04 Rate
Texas	14.92	Texas	119.36
Nowata	9.46	Cimarron	63.53
Haskell	8.48	Beaver	51.22
Kingfisher	7.18	Ellis	24.54
Choctaw	6.52	Grant	19.44
Logan	2.95	Greer	16.50
Delaware	2.7	Okmulgee	15.12
Okmulgee	2.52	Woods	11.00
Jackson	3.52	Carter	10.96
Garfield	1.73	Woodward	10.82
Tulsa	1.24	Kiowa	9.78
Oklahoma	0.45	Nowata	9.46
State Total	0.64	State Total	3.48

* Incidence rates per 100,000 population were calculated based on U.S. census 2000.

Epidemiologic Features of Human WN Cases; Oklahoma 2004

Gender	Number	%
Male	15/22	68.2%
Female	7/22	31.8%

Race	Number	%
White	17/22	77.3%
Black	2/22	9.1%
Other	2/22	9.1%
American Indian	1/22	4.5%

Exposure	Number	%
Mosquito Bite	11/17	64.7%
Travel*	6/9	31.6%

* Travel defined as travel outside of county or out-of-state within 14 days of symptom onset.

Summary of Symptoms Reported by WN Cases, 2004

Symptoms	Number	%
Fever	19/22	86.4
Headache	13/21	61.9
Muscle Weakness	13/22	59.1
Confusion	12/22	54.5
Disorientation	10/22	45.5
Vertigo	9/20	45
Stiff Neck	8/20	40
Tremor	7/22	31.8
Vomiting	7/22	31.8
Stupor	2/20	10
Rash	2/21	9.5
Rigidity	2/21	9.5
Seizures	2/22	9.1
Hyperreflexia	1/19	5.3
Paralysis	1/22	4.5
Coma	1/22	4.5

Outcome	Number	%
Died	3/22	13.6
Hospitalized	16/22	72.7

Avian, Equine, and Human WN Cases; Oklahoma 2002 - 2004

Year	Case Num-		
	Avian	Equine	Human
2002	441	965	21
2003	401	169	79
2004	388	32	22

{Summary of Selected Notifiable Disease Reports in Oklahoma}

diseases/conditions	summer quarter ¹	year to date ²	5 year avg. ³
Campylobacteriosis	113	177	171.8
Cryptosporidiosis	7	13	7.6
<i>E. coli</i> O157:H7	9	10	11
Ehrlichiosis	0	3	9.8
Giardiasis	25	57	46.8
<i>H. flu</i> (all types)	18	42	30
Hep A	0	3	58.6
Hep B	3	18	53.6
Hep C	0	0	5.4
Meningococcal Inf	8	13	14.2
RMSF	3	5	55
Salmonellosis	102	157	176
Shigellosis	200	385	231.4
<i>S. invasive</i> group A	22	69	34.6
<i>S. pneumoniae</i> , invasive	146	456	261.4
Tularemia	4	6	5

1. 04.01.05 through 06.30.05
2. 01.01.05 through 06.30.05
3. aggregate data for summer quarter of years 2000 through 2004

diseases of low frequency	year to date ²	5 year avg. ³
Brucellosis	0	0.0
HUS	2	1.0
Legionellosis	2	5.2
Listeriosis	0	1.8
Lyme disease	0	0.6
Malaria	2	3.6
Psittacosis	0	0.0
Typhoid fever	0	0.0
Vibriosis	1	0.2
Yersinia	0	1.8

no. of animal rabies cases by animal type	year to date ²	%
Cat	1	1.9%
Cow	5	9.4%
Dog	5	9.4%
Goat	1	1.9%
Horse	3	5.7%
Skunk	38	71.7%
Total	53	100%

This publication, printed by OU Press, was issued by the Oklahoma State Department of Health as authorized by James M. Crutcher, MD, MPH. 5,200 copies were printed in August 2005 at a cost of \$2,685. Designed by Sara C. Ramsey

Oklahoma State Department of Health
 1000 N.E. Tenth Street
 Oklahoma City, Oklahoma
 73117-1299

U.S. postage PAID
 presorted standard
 permit no.1504
 Oklahoma City, OK



James Michael Crutcher, MD, MPH
 Commissioner of Health and State Health Officer

Joe Mallonee, MPH
 Deputy Commissioner for Disease and Prevention Services

Laura M.K. Smithee, MES, MS
 Director, Communicable Disease Division

Laurence Burnsed, MPH
 Assistant Director, Communicable Disease Division