Mumps

2007 Case Total	7	2007 Rate	0.19 per 100,000
2006 Case Total	11	2006 Rate	0.31 per 100,000

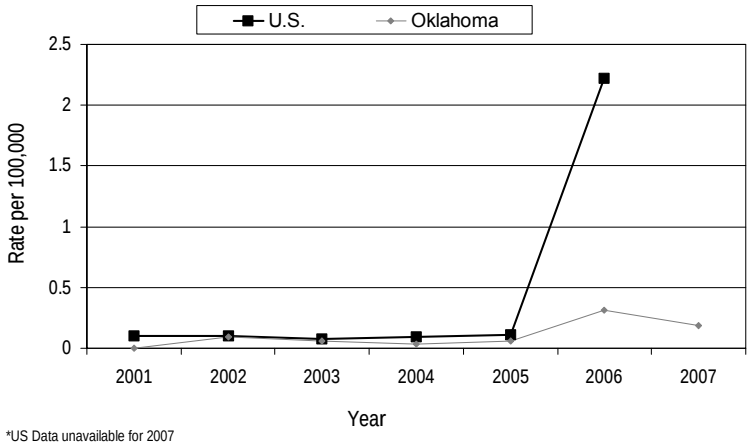
Seven cases of mumps were reported during 2007 resulting in an incidence rate of 0.19 per 100,000 Oklahoma population. Cases ranged in age from 5 years to 48 years with a median age of 23 years. No cases were hospitalized and no deaths due to mumps were reported. All seven cases reported experiencing parotitis lasting greater than or equal to two days without other apparent cause identified. Other symptoms reported by cases included fever (N=2, 29%%) and sore throat (N=1, 14%). No cases experienced orchitis or meningitis, and no cases were hospitalized.

One case was associated with an elementary school. No secondary cases were identified during investigations conducted by county health department communicable disease nurses. One case was confirmed by detection of IgM antibodies; no cases were confirmed by viral culture. OSDH recommends testing patients presenting with symptoms consistent with mumps using serology and viral culture. Viral culture of the parotid duct gland should be collected within the first three days of parotitis. IgM and IgG acute and convalescent specimens should also be collected 14 days apart to confirm mumps.

Demographic Summary of Reported Mumps Cases, Oklahoma, 2007 (N=7)

	Number (%)	Incidence Rate per 100,000
Gender		
Male	6 (86%)	0.34
Female	1 (14%)	0.05
Age	Median Age: 23 years (Range: 5 years – 48 years)	
Race		
White	4 (57%)	0.14
African American or Black	0	--
American Indian	1 (14%)	0.35
Pacific Islander/Native Hawaiian	0	--
Asian	0	--
Hispanic Ethnicity	1 (1%)	0.38

Mumps Incidence Rate by Year, Oklahoma and U.S., 2001-2007*



*US Data unavailable for 2007

Pertussis

2007 Case Total	58	2007 Rate	1.60 per 100,000
2006 Case Total	64	2006 Rate	1.79 per 100,000

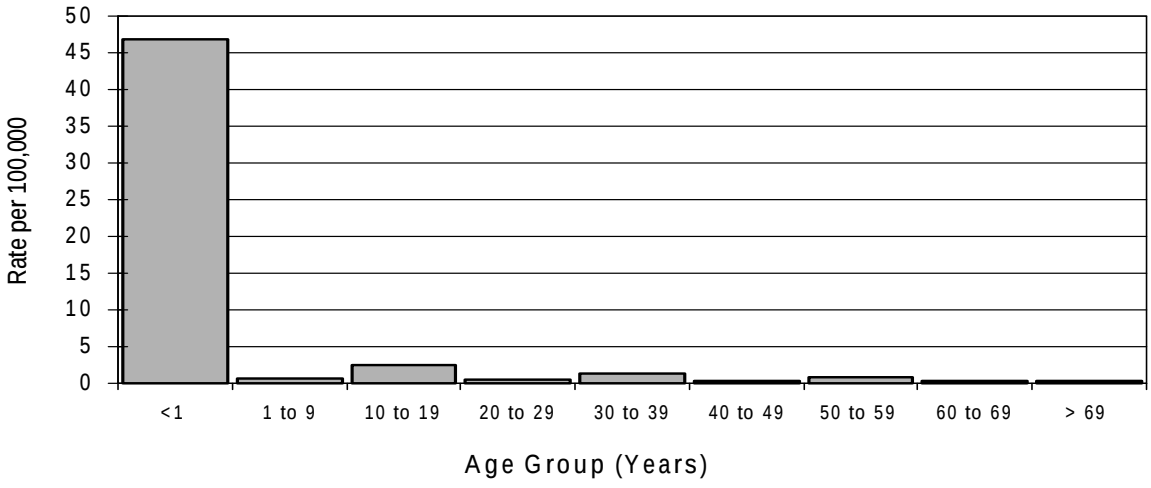
Pertussis occurred among persons of all ages in Oklahoma; the age range of reported cases in 2007 was 1 day to 71 years (median age of 6 years), but disproportionately affected children less than one age. Infants accounted for 45% (N=26) of cases resulting in an age-specific incidence rate of 46.8 per 100,000 infants. The incidence rate of pertussis among infants was 19 to 160 times higher than all other age groups (refer to graph). Ninety-six percent of infants with pertussis were hospitalized and one death was reported in a 2-month-old child.

Pertussis is an upper respiratory infection characterized by a prolonged cough lasting weeks to months. Cases reported a cough duration that ranged from 14 to 90 days with median cough duration of 35 days. Symptoms characteristic of pertussis experienced by cases included paroxysms (91%), vomiting after paroxysms (48%), and an inspiratory whoop (38%). Most symptoms experienced by infants were similar to cases of other ages, which included cough (100%), paroxysms (96%), and inspiratory whoop (31%). Unlike adults and older children, infants also presented with apnea (85%). Six cases were confirmed by isolation of *Bordatella pertussis* from a clinical specimen, 14 by polymerase chain reaction (PCR), and 12 by both culture and PCR.

County health department public health nurses conduct investigations of pertussis cases to identify persons who are close personal contacts to recommend postexposure prophylaxis (PEP) to control spread. Two hundred and thirty one close contacts (median=3, range 0-29 contacts) of cases reported in 2007 were recommended to receive PEP. Sixteen cases were associated with a high-risk setting such as a childcare center, doctor's office, or school.

Pertussis vaccine is recommended for all children beginning at 2 months of age with the primary 3-dose series followed by a booster vaccination at 12-15 months of age. Immunity to pertussis wanes approximately 5-10 years after completion of the primary childhood series, leaving adults and adolescents susceptible to the disease. An adolescent vaccine (Tdap) is recommended for persons 11-64 years of age and should replace one booster dose of Td. This dose is especially important in for persons who reside in a household or may have contact with persons at highest risk of developing disease.

Rate of Reported Pertussis Cases by Age Group, Oklahoma, 2007



Demographic and Clinical Characteristics of Reported Pertussis Cases, Oklahoma, 2007 (N=58)

	Number (%)	Incidence Rate per 100,000
Gender		
Male	18 (31%)	1.01
Female	40 (69%)	2.19
Age	Median Age: 6 years (Range: 1 Day – 71 years)	
Hospitalization	29 (50%)	--
Deaths to Pertussis	1 (3.8%)	--
Race		
White	38 (65.5%)	1.34
African American or Black	1 (1.7%)	0.35
American Indian	6 (10.3%)	2.10
Pacific Islander/Native Hawaiian	0	--
Asian	1 (1.7%)	1.60
Persons reporting >1 race	3 (5.2%)	
Hispanic Ethnicity	10 (17%)	3.82
Symptoms		
Cough	58 (100%)	--
Duration of Cough	Median Cough Duration: 35 days (Range: 14 days – 90 days)	
Paroxysms	53 (91.4%)	--
Apnea	31 (53%)	--
Post-tussive vomiting	28 (48.3%)	--
Inspiratory whoop	22 (37.9%)	--
Cases <1 year of age	26	46.82
Symptoms		
Cough	26 (100%)	--
Duration of Cough	Median Cough Duration: 30 Days (Range: 14 days – 86 days)	
Paroxysms	25 (96%)	--
Apnea	22 (85%)	--
Post-tussive vomiting	12 (46%)	--
Inspiratory whoop	8 (31%)	--
Age-Appropriately Vaccinated	5 (50%)	--

Multi-State Avian Psittacosis Investigation and Response – December, 2007

Background

Psittacosis, also called parrot fever or ornithosis, is a bacterial zoonotic illness caused by *Chlamydophila (*previously *Chlamydia) psittaci*. It is reportable to the National Notifiable Disease Surveillance System in 42 states, including Oklahoma. *C. psittaci* infections have been documented in approximately 150 avian species including pet birds, shore birds, pigeons, and domestic poultry. In all infected birds, the disease varies from one producing high morbidity and mortality to one that is asymptomatic. Even though infected birds may not appear sick, they often shed the organism in their respiratory secretions or droppings. *C. psittaci* can remain viable in bird droppings for considerable periods of time depending upon the ambient environmental conditions. Thus, droppings from pigeon lofts, aviaries, and uncleaned cages in pet shops can potentially serve as sources of infection for humans.

As a human illness, psittacosis may occur in sporadic or epidemic form. Infection is acquired by inhaling infected droplets or by direct contact with infected feces, feathers, or tissue. The incubation period is 5-14 days, although not all persons exhibit symptoms. Persons with symptomatic infection typically have abrupt onset of fever, chills, headache, malaise, and myalgia. A non-productive cough may also develop that can be accompanied with breathing difficulty or chest tightness. A pulse-fever dissociation, splenomegaly, and nonspecific rash when present are usually indicative of psittacosis in persons with community-acquired pneumonia. The most commonly implicated birds as a source for human illness are parrots and related species, such as cockatiels and parakeets (psittacine birds). Outbreaks among pet birds and commercial poultry and turkey flocks have caused outbreaks among persons exposed to these birds.[*]

2007 Avian Outbreak Linked to Florida Bird Vendor

On December 21, 2007, a probable human case of psittacosis was identified in a pet store employee in Minnesota. Because another employee was also ill, the source of all birds in the store was quickly evaluated. Although no ill birds were identified at the Minnesota store, the vendor was found to be the same source for sick birds testing positive for psittacosis in several other pet stores around the country. On the following day, state public health veterinarians in 45 states were notified that stores in their states were customers of the Florida aviary. In Oklahoma, multiple stores within the same chain were found to have infected birds. To prevent spread to pet store workers or customers, all birds were placed into isolation and fed doxycycline-treated seed for a minimum of 45 days before retesting. Store managers were advised to report any respiratory illness occurring among employees or patrons for public health investigation. Follow- up in Oklahoma occurred until April 11, 2008 when the last group of birds being monitored tested negative and were released from isolation. Although the extensive geographical distribution of infected birds had the potential to lead to a large human disease outbreak, rapid public health intervention is credited with limiting the zoonotic transmission. Four cases of psittacosis were identified during this outbreak; no human illness was confirmed in Oklahoma.

For comprehensive information on the diagnosis, prevention and control of *C. psittaci* infection among humans and pet birds, access the most current edition of the Psittacosis Control Compendium at: http://www.nasphv.org/documentsCompendiaPsittacosis.html

[*] Schlossberg D, Delgado J, Moore MJ, et al. An epidemic of avian and human psittacosis. Arch Int Med 1993;153:2594-2596.

Animal Rabies

2007 Case Total	78
2006 Case Total	69

The number of rabid animals in Oklahoma during 2007 increased slightly with a total of 78 confirmed cases compared to 69 cases in 2006. Animal rabies activity in Oklahoma tends to follow a cyclical trend with increases or activity peaks occurring approximately every six to eight years. The most recent peak was in 2003 when 204 animals were identified as rabid by laboratory testing. Animal rabies incidence steadily declined since that time until the slight increase in 2007. A seasonal trend in rabid animals is also expected. In 2007, the months with the highest number of cases were March through June with a range of eight to 15 cases per month during this time.

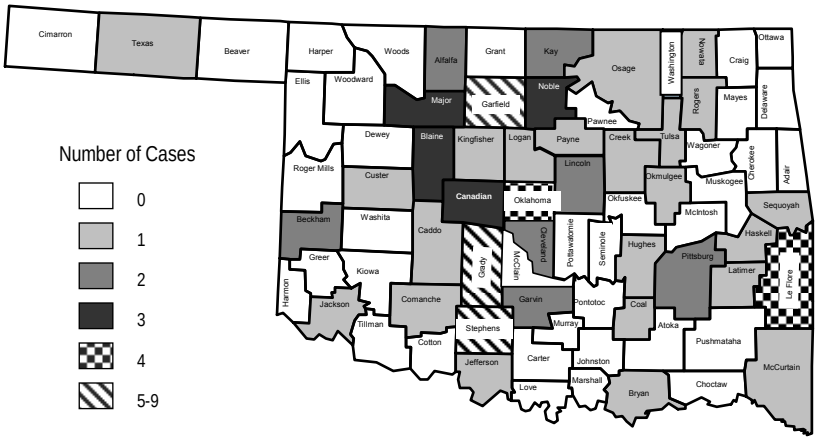
The geographic distribution of animal rabies is spread across the state of Oklahoma. Counties with the highest number of cases in 2007 were Stephens (9), Grady (7), Garfield (7), Le Flore (4), Oklahoma (4), Blaine (3), Canadian (3), Major (3) and Noble (3). Additionally, seven counties had two cases and 21 counties had one animal that tested positive for rabies.

When an animal tests positive for rabies or the result is inconclusive, an epidemiologist in the Acute Disease Service (ADS) of the Oklahoma State Department of Health (OSDH) initiates a thorough investigation of potentially exposed animals and humans. Recommendations for human post exposure prophylaxis (PEP) and/or requirements for animal quarantine or euthanasia are made based upon the findings of the investigation. In 2007, 117 animals and 25 humans were deemed exposed to rabid animals. Exposure to rabies virus usually results from the bite of a rabid animal, but may also occur by mucous membrane or broken skin contact with the rabid animal's neural tissue, cerebrospinal fluid or saliva. Of the exposed animals, 35 (30%) were properly vaccinated and therefore required to receive a booster dose of the rabies vaccine along with a 45-day observation period on the owner's property. Of the 82 exposed pets that were not currently vaccinated, owners of 21 (26%) elected placement in a six-month quarantine under the supervision of a licensed veterinarian, and owners of 61 (74%) chose to have the animal euthanized. All persons who are assessed as having potential exposure to rabies are advised to seek rabies PEP through a health care provider. In the Spring 2007 edition of the Epi Bulletin, an article outlining the PEP recommendations following an animal bite was published. The article is available on the OSDH ADS website.* Consultation regarding the PEP series is also available by contacting the epidemiologist-on-call at (405) 271-4060.

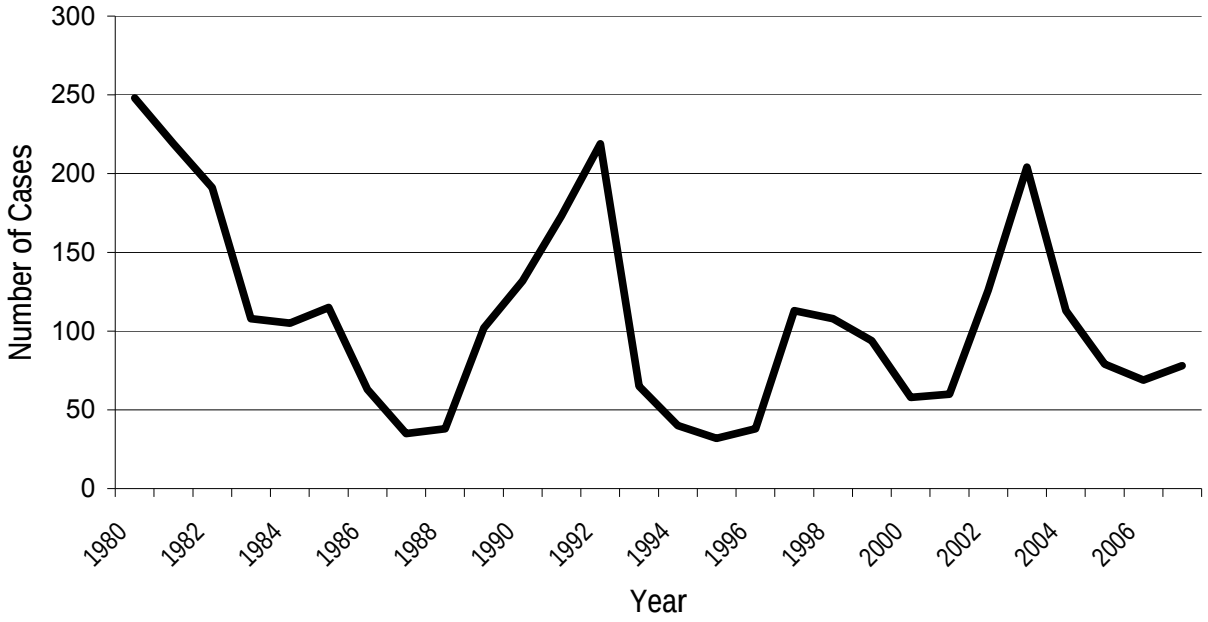
The OSDH Public Health Laboratory (PHL) tested a total of 1399 animals for rabies in 2007. Of these, 1297 (92.7%) were negative, 26 had unsatisfactory results due to a crushed or decomposed head, and the remaining 76** were positive for rabies. In Oklahoma, skunks historically have been more likely to test positive for rabies. Of 76 skunks tested in 2007, 75% (57) tested positive. In contrast, only four of 596 dogs (0.67%), three of 458 cats (0.66%), four of 53 bats (7.55%), seven of 58 cattle (12.07%), and two of 14 goats (14.29%) tested positive for rabies. In the event that an animal is suspected to be rabid, the OSDH PHL is the only lab in the state of Oklahoma with the capability of testing the animal. For questions regarding testing, please consult the OSDH PHL at (405) 271-5070.

* http://www.ok.gov/health/documents/SPRING%20EPI%2007%20WEB.pdf
**Two rabies cases in 2007 were tested at an out-of-state laboratory.

Animal Rabies in Oklahoma by County, 2007



Number of Confirmed Animal Rabies Cases in Oklahoma 1980 - 2007



Rocky Mountain Spotted Fever

2007 Case Total	186	2007 Rate	5.14 per 100,000
2006 Case Total	134	2006 Rate	3.90 per 100,000

The incidence of Rocky Mountain spotted fever (RMSF) in 2007 was the third highest occurrence of reported cases in the past 10 years (refer to graph). The incidence rate in Oklahoma for 2007 (5.14 per 100,000) was 10.7 times higher than the 5-year average U.S. average rate of 0.48 per 100,000 population from 2002 through 2006. In Oklahoma, the eastern part of the state observed higher rates of disease due to its more favorable tick habitat. Counties with the highest incidence rates in 2007 were Latimer (66.62 per 100,000), Pushmataha (51.43 per 100,000), and Haskell (49.76 per 100,000).

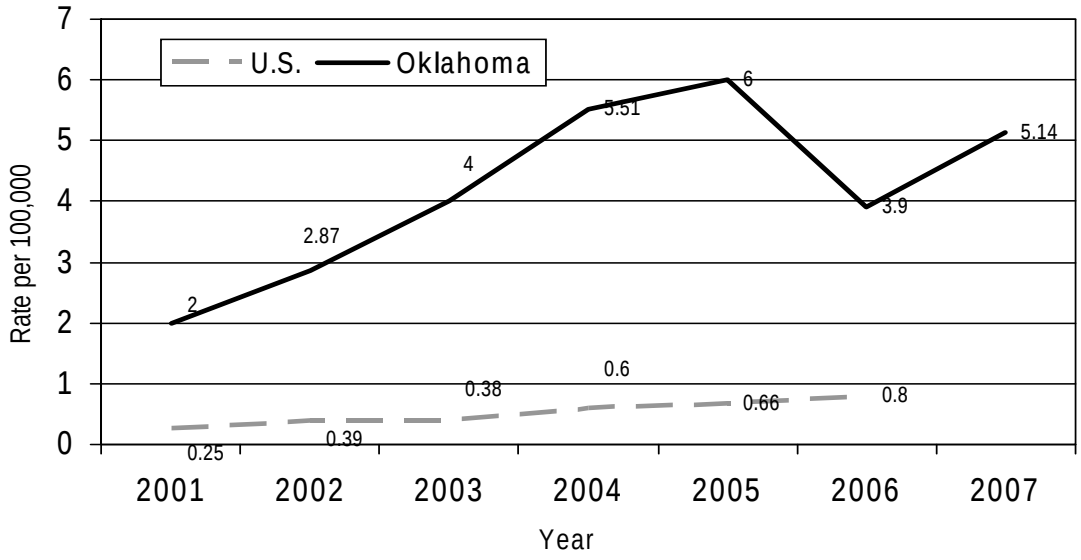
The age of RMSF cases ranged from 2 years to 84 years with a median age of 45 years. The rate of cases among males was 1.74 times higher than the incidence rate among females. The highest rate of RMSF was in the Native American/Alaska Native population with a rate of 16.45 per 100,000 population, which is over 3 times higher than the overall Oklahoma rate of 5.14 per 100,000 population in 2007. Eighty-seven percent of cases reported an onset of symptoms during the months from April through September.

Serologic testing is the most widely available and frequently used laboratory method for diagnosis. Collection of acute (within a week of onset) and convalescent (2 to 4 weeks later) specimens is important to evaluate and confirm titer changes for diagnosis. A single specimen is generally not diagnostic of acute infection since it may indicate past exposure. Treatment for RMSF should be initiated before laboratory confirmation, when there is high suspicion of tickborne illness, to reduce the severity of disease.

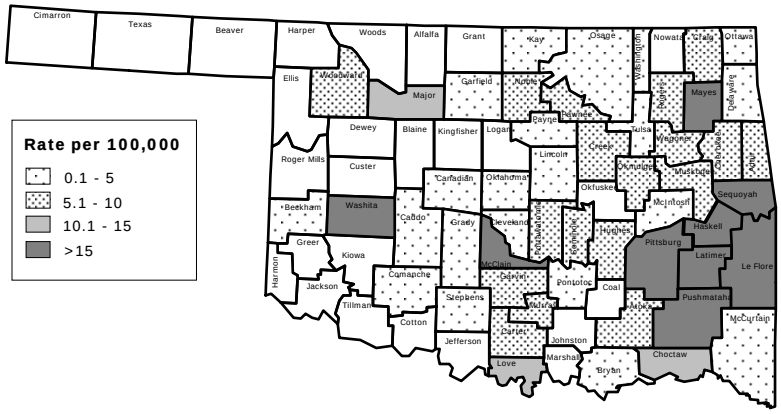
Demographic and Clinical Summary of Reported Rocky Mountain Spotted Fever Cases, Oklahoma, 2007 (N=186)

	Number (%)	Incidence Rate per 100,000
Gender		
Male	117 (63%)	6.55
Female	69 (37%)	3.77
Age	Median: 45 years (Range: 2 years – 84 years)	
Hospitalization	35 (19%)	--
Deaths	0	--
Race		
White	124 (67%)	4.38
African American or Black	7 (4%)	2.44
Native American / Alaska Native	47 (25%)	16.45
2 or more races	2 (1%)	1.38
Unknown	6 (3%)	--
Hispanic Ethnicity	5	1.91
Symptoms		
Fever	185 (99%)	--
Headache	163 (88%)	--
Malaise	160 (86%)	--
Chills	145 (78%)	--
Myalgia	142 (76%)	--
Rash	78 (42%)	--
Reported Exposures		
Exposure to wooded area	150 (81%)	--
History of tick bite	133 (72%)	--

Incidence Rate of Reported Rocky Mountain Spotted Fever Cases, Oklahoma and United States, 2001-2007



Rate of Reported RMSF Cases by County of Residence, Oklahoma, 2007



Salmonellosis

2007 Case Total	709	2007 Rate	19.6 per 100,000
2006 Case Total	605	2006 Rate	17.5 per 100,000

The rate of salmonellosis in Oklahoma increased 17% between 2006 and 2007 resulting in the third straight year the number of reported *Salmonella* cases has increased in Oklahoma. Of the 709 cases reported, 42 (17%) were ill contacts to a confirmed case who were identified by the county communicable disease nurse (CDN) during investigation, but which were not laboratory confirmed. During the year, a seasonal trend for salmonellosis was observed, with the highest number of cases occurring during the late summer and fall months.

The age range of cases was from one day to 87 years with a median of 26 years of age. When the cases are grouped by age (see graph), the highest incidence rate occurred among children less than 1 year of age (162 per 100,000). Twenty-one percent (N=152) of reported cases were hospitalized due to salmonellosis. Three deaths due to salmonellosis occurred in 2007. These hospitalizations and deaths are a reminder that although salmonellosis is usually a self-limiting disease, severe cases do occur.

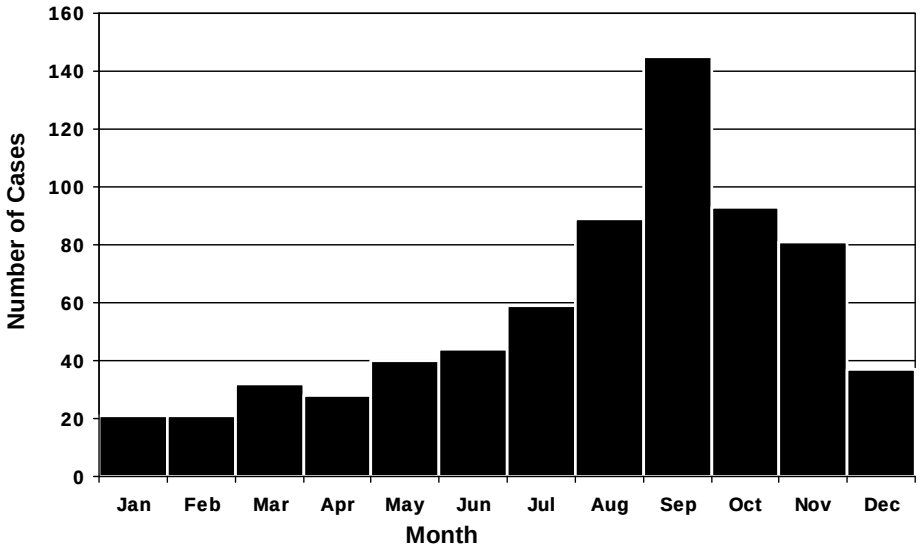
Clinical isolates of *Salmonella* spp. identified by laboratories are required to be submitted to the OSDH Public Health Laboratory (PHL). These referred isolates are confirmed as *Salmonella*, serotyped, and analyzed using pulsed-field gel electrophoresis (PFGE), generating distinct patterns that can be used to identify outbreaks. PFGE patterns are stored in a database and shared with the Centers for Disease Control and Prevention (CDC), which result in the identification of multistate outbreaks. While several PFGE clusters were identified in Oklahoma in 2007, no common sources of infection were identified after epidemiologic investigation. The reason for the large increase in salmonellosis in September 2007 is not evident as the *Salmonella* isolates are represented by numerous serotypes and PFGE patterns.

The OSDH PHL received 647 *Salmonella* isolates for confirmation and serotype identification, representing 97% of culture-confirmed cases. Forty different serotypes were identified, with the top five serotypes being Newport (200 cases, 30.9% of typed isolates), Typhimurium (95 cases, 14.7%), Enteriditis (42 cases, 6.5%), Paratyphi B (38 cases, 5.9%) and Heidelberg (21 cases, 3.3%). Together these top five serotypes accounted for 61.2% of isolates.

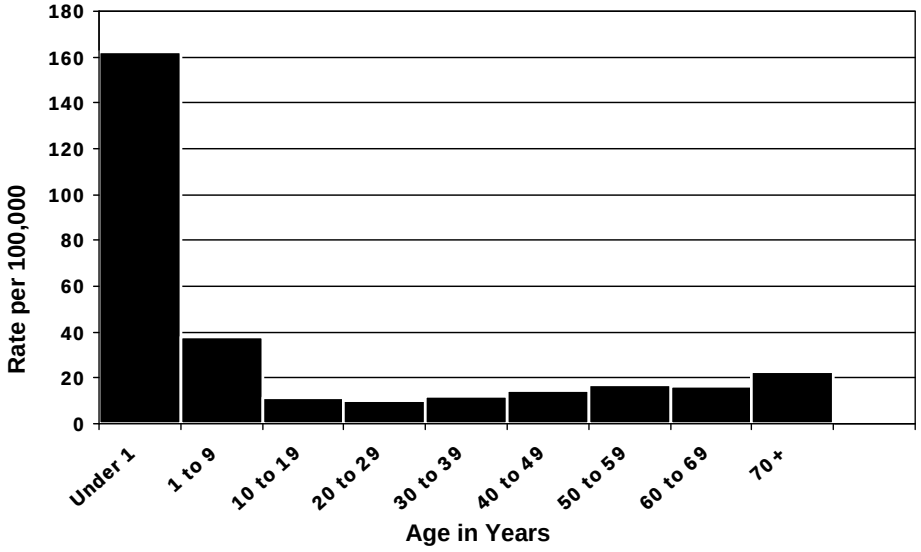
Demographic Summary of Reported *Salmonella* Cases, Oklahoma, 2007 (N=709)

	Number (%)	Incidence Rate per 100,000
Gender		
Male	327 (47%)	18.3
Female	382 (53%)	20.9
Age	Median Age: 26 years (Range 1 day-87 years)	
Race		
White	524 (74%)	19.2
African American or Black	38 (5%)	14.2
Native American / Alaskan Native	63 (9%)	22.8
Asian	11 (2%)	21.8
Hispanic ethnicity		
Hispanic / Latino	47 (7%)	24.5
Not Hispanic / Latino	526 (74%)	--
Unknown	136 (19%)	--

Number of Reported Salmonellosis Cases by Month of Onset, Oklahoma, 2007



Incidence Rate of Reported Salmonellosis Cases by Age Group, Oklahoma, 2007



Shigellosis

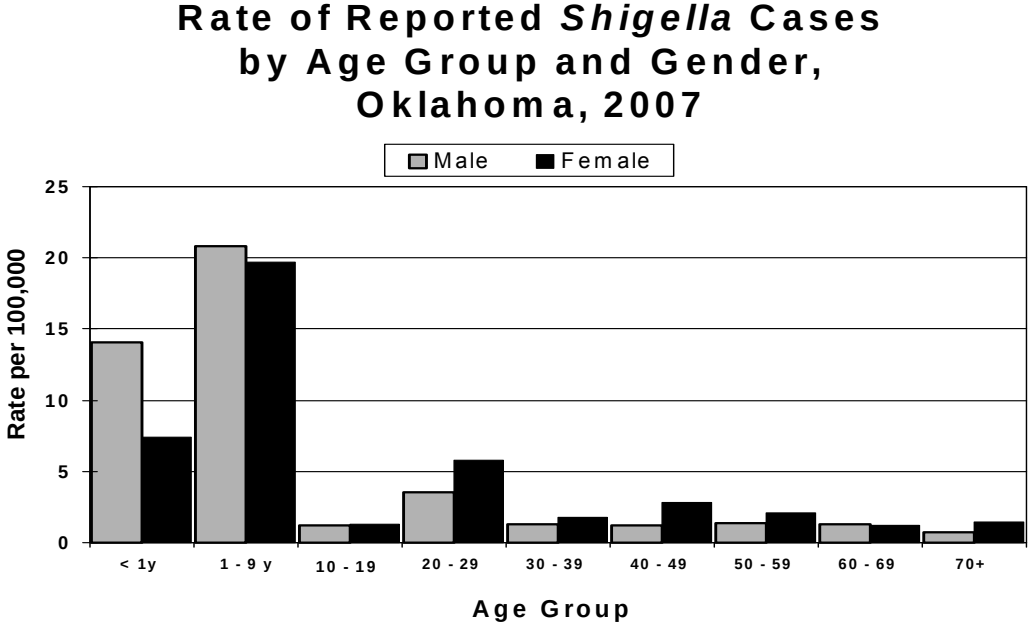
2007 Case Total	162	2007 Rate	4.48 per 100,000
2006 Case Total	195	2006 Rate	5.45 per 100,000

The incidence of shigellosis in Oklahoma peaked in 2003 with 1,078 cases (rate = 30.8 per 100,000) and has dropped steadily over the past five years. All infections of *Shigella* are required to be reported to the OSDH and all isolates must be forwarded to the OSDH Public Health Laboratory for confirmation and speciation. Of the 125 specimens submitted, *Shigella sonnei* was the primary species to be reported comprising 92% (N=115) of the isolates speciated by the PHL; other species include *S. flexneria* (N=9, 7%) and *S. boydii* (N=1, 1%).

Shigellosis is typically a mild, self-limiting enteric disease. In 2007, predominant symptoms included diarrhea (98%), cramps (77%), fever (70%) and nausea (62%). Seventeen percent of cases required hospitalization. The median duration of diarrhea was 17 days with a range of one to 21 days. The rate of disease in those under 10 years of age (20 per 100,000) was over four times greater than the overall incidence rate. Of cases that reported an association with a high-risk setting (N=69), 69% were associated with a childcare center with 42 attendants and five employees. Due to the high secondary attack rates of shigellosis in households and high-risk settings such as those involving childcare or foodservice establishments, County Health Department Public Health Nurses investigate all cases of shigellosis to implement control measures and reduce spread.

Demographic Summary of Reported Shigellosis Cases, Oklahoma, 2007 (N=162)

	Number (%)	Incidence rate per 100,000
Gender		
Female	84 (52%)	4.59
Male	77 (48%)	4.31
Age (years):	Median = 6 years (Range 2 months-76 years)	--
Race (N=132)		
White	101 (76.5%)	3.56
African American or Black	11 (8.3%)	3.83
American Indian or Alaska Native	18 (13.6%)	6.3
Asian	2 (1.5%)	3.2
Hispanic ethnicity	24 (18%)	9.2



Streptococcus, Group A Invasive Disease

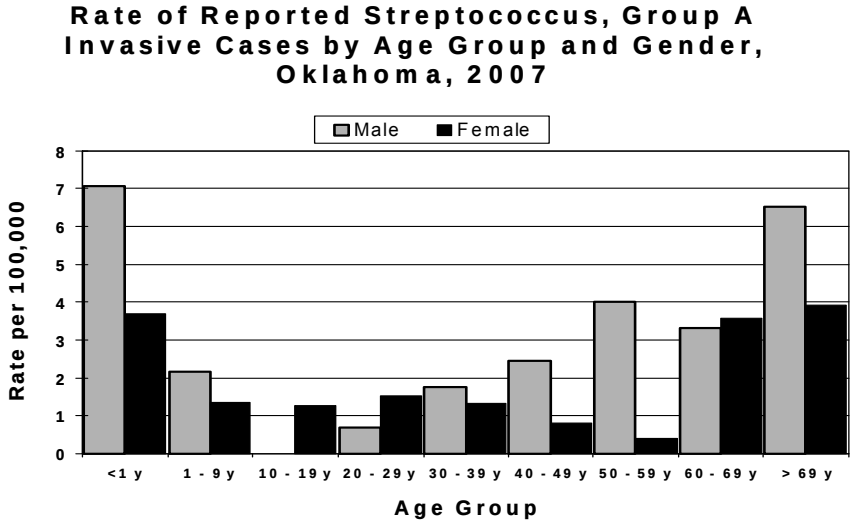
2007 Case Total	86	2007 Rate	2.38 per 100,000
2006 Case Total	125	2006 Rate	3.83 per 100,000

Invasive group A streptococcal infections may manifest as several clinical presentations, such as pneumonia, bacteremia in association with a cutaneous infection (e.g., cellulitis, erysipelas, or infection of a surgical or nonsurgical wound), deep soft-tissue infection (e.g., myositis or necrotizing fasciitis), meningitis, peritonitis, osteomyelitis, septic arthritis, postpartum sepsis (i.e., puerperal fever), neonatal sepsis, and nonfocal bacteremia.

In 2007, the number of cases decreased by 31%. The most common presentation was bacteremia/sepsis (79 cases, 92%). Following in order of frequency were cellulitis (23 cases, 27%), pneumonia (12 cases, 14%), necrotizing fasciitis (5 cases, 6%), meningitis (2 cases, 2%), abscess (not skin, 2 cases, 2%), and one each of bursitis, entometritis, osteomyelitis, otitis media, and septic arthritis (1%). More than one presentation occurred in 39 (45%) cases. Necrotizing fasciitis is one of the most remarkable presentations due to the rapidity of progression, and high rate mortality. Of the five cases of necrotizing fasciitis in 2007, two expired.

Demographic Summary of Reported Invasive Streptococcus Group A Cases, Oklahoma, 2007 (N = 86)

	Number (%)	Incidence rate per 100,000
Gender		
Male	44 (51%)	2.4
Female	42 (49%)	2.4
Age	Median = 55 years (range: 1 month – 92 years)	
Race		
White	65 (76%)	2.29
American Indian/Alaska Native	8 (9%)	2.80
African American or Black	7 (8%)	2.44
Asian	1 (1%)	1.6
Unknown	5 (6%)	--
Hispanic Ethnicity (N = 54)		
Hispanic/Latino	6 (7%)	2.35
Hospitalization	58 (67%)	--
Deaths	20 (23%)	--



Streptococcus pneumoniae, Invasive Disease in Children <5 Years

2007 Case Total	77	2007 Rate	29.5 per 100,000
2006 Case Total	73	2006 Rate	28.7 per 100,000

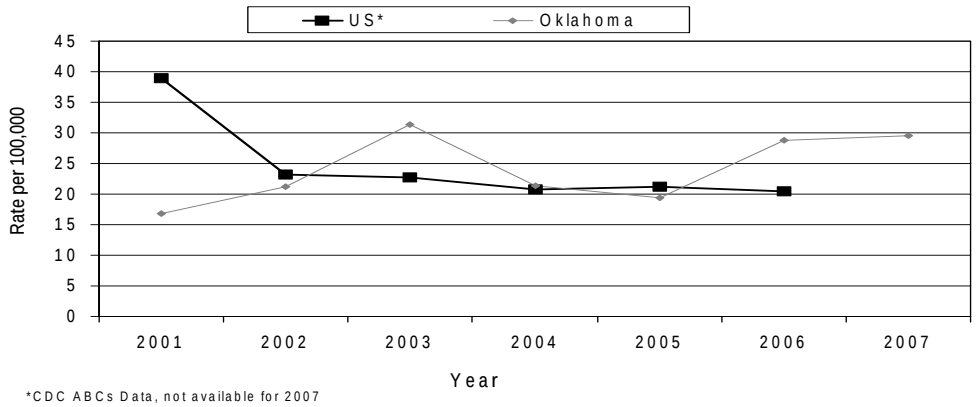
Invasive *Streptococcus pneumoniae* (IPD) causes a wide spectrum of disease, including otitis media, pneumonia, bacteremia/sepsis, and meningitis. IPD is a seasonal disease, 50% (N=37) of cases in 2007 occurred between November and February. In 2000, a 7-valent conjugate vaccine (PCV7) was recommended for use in all children less than 2 years of age. Invasive pneumococcal disease (IPD) became reportable in Oklahoma in 2000 for all ages; however, changes were made in June 2007 to require reporting of invasive disease only in children <5 years of age. Since 2005, the rate of IPD in Oklahoma has increased yearly and is higher that the US (refer to graph).

Summary Statistics, IPD children <5, Oklahoma 2007 (N=77)

	Number (%)	Incidence Rate per 100,000
Gender		
Male	43 (56%)	32.11
Female	34 (44%)	26.72
Age	Median= 13 months (range: 1 day – 4 years)	
Hospitalization	58 (75%)	--
Deaths	2 (2.7%)	--
Race		
White	51 (66%)	24.61
African American or Black	12 (16%)	34.38
Native American/Alaskan Native	6 (7.8%)	20.49
PI/Native Hawaiian	1 (1%)	180.51
Asian	0	0.00
Unknown	7 (9%)	--
Hispanic Ethnicity (N=43)	4 (9%)	--
Infection Types*		
Bacteremia/sepsis	72 (93.5%)	--
Meningitis	10 (13%)	--
Pneumonia	30 (39%)	--
Otitis Media	12 (15.6%)	--
Current PCV7 Vaccination, age-appropriate**	43 (63%)	--
Serotype(s)+: PCV7 serotype	5 (7%)	--

*Not mutually exclusive; **Those eligible for vaccination (N=68); +Isolates received to PHL (N=70)

Incidence Rate of Invasive *Streptococcus pneumoniae* Children <5 Years, by Year, Oklahoma and U.S., 2001-2007*



*CDC ABCs Data, not available for 2007

Tuberculosis

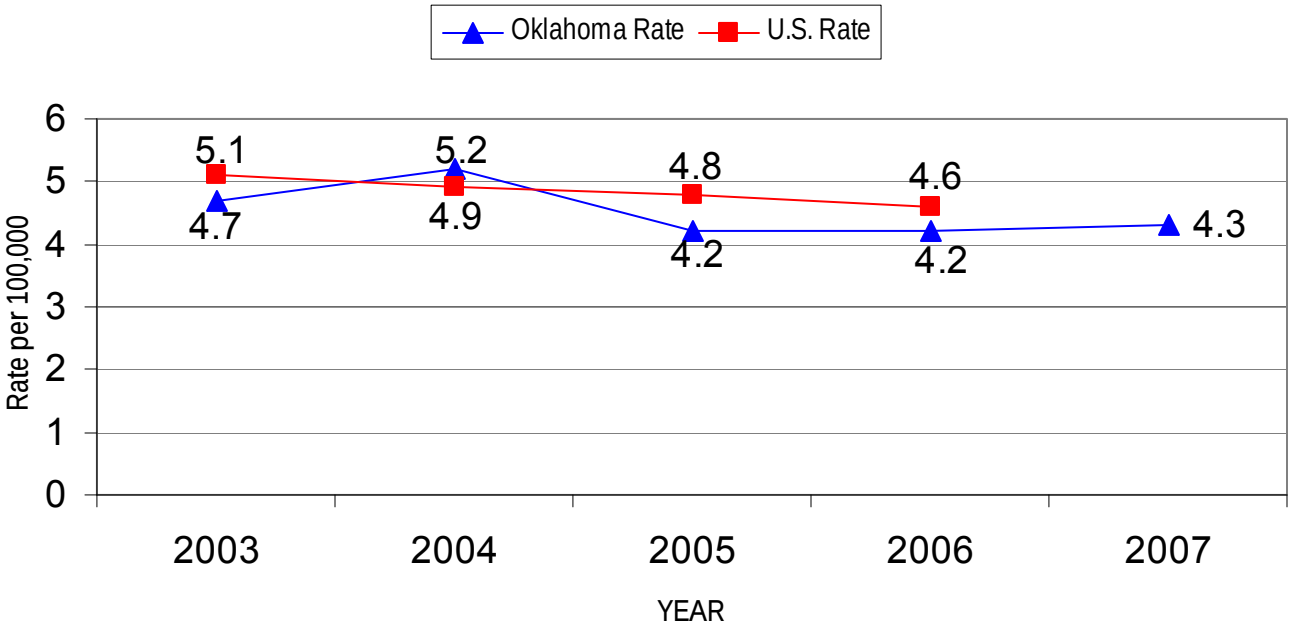
2007 Case Total	149	2007 Rate	4.1 per 100,000
2006 Case Total	144	2006 Rate	4.2 per 100,000

Tuberculosis (TB) is often considered a disease of the past. Nearly one-third of the world's total population, or about two billion people, are infected with the bacteria that cause TB. Each year, approximately 9 million people around the world become sick with TB. Through public health efforts of timely case diagnosis, contact investigation, administration of therapy, prevention, and education, the United States has seen a steady decline of TB. Oklahoma has followed the national trend dropping from 190 cases reported with active tuberculosis disease in 2002 to 149 persons in 2007. Although the rate of TB has declined, TB remains a public health concern in Oklahoma.

Prevention, early diagnosis and treatment can make the difference in health issues and keeping communities and families healthy. Persons diagnosed with active TB must comply with an intensive course of treatment. TB disease is treated and cured through a strict regimen in administering the medication, which takes at least six months to properly treat. Oklahoma uses directly observed therapy (DOT), through which a health care provider is assigned to physically observe the patient take doses of TB medication. This helps the patient to effectively adhere to a treatment plan.

For information about TB disease and testing, contact the OSDH Acute Disease Service, TB Division at 405-271-4060, visit this Web site: www.health.ok.gov or contact your local county health department.

Incidence Rate of Reported Tuberculosis Cases,
United States and Oklahoma 2003-2007



U.S. Rate not available for 2007

Tuberculosis Trends of Reported Cases in Oklahoma, 2003-2007

	2003	2004	2005	2006	2007
Number of Cases	163	178	144	144	149
AGE**					
0-4	11 (7%) 5/100,000	14 (8%) 6/100,000	12 (8%) 5/100,000	8 (6%) 3/100,000	12 (8%) 5/100,000
5-14	1 (1%) 1/100,000	10 (6%) 2/100,000	7 (5%) 1/100,000	3 (2%) 0.6/100,000	9 (6%) 2/100,000
15-24	16 (10%) 3/100,000	24 (13%) 5/100,000	7 (5%) 1/100,000	9 (6%) 2/100,000	11 (7%) 2/100,000
25-44	51 (31%) 5/100,000	50 (28%) 5/100,000	40 (28%) 4/100,000	36 (25%) 4/100,000	36 (24%) 4/100,000
45-64	52 (32%) 7/100,000	54 (30%) 7/100,000	53 (37%) 7/100,000	56 (39%) 7/100,000	60 (40%) 8/100,000
65-Over	32 (20%) 7/100,000	27 (15%) 6/100,000	25 (17%) 5/100,000	32 (22%) 7/100,000	21 (14%) 5/100,000
RACE**					
American Indian	33 (20%) 12/100,000	36 (20%) 13/100,000	32 (22%) 12/100,000	22 (15%) 8/100,000	30 (20%) 11/100,000
Asian	16 (10%) 34/100,000	20 (11%) 43/100,000	14 (10%) 30/100,000	20 (10%) 43/100,000	8 (5%) 17/100,000
African American or Black	27 (17%) 9/100,000	32 (18%) 12/100,000	21 (15%) 8/100,000	22 (15%) 8/100,000	22 (15%) 8/100,000
Native Hawaiian or Pacific Islander	0 0	0 0	0 0	0 0	5 (3%) 210/100,000
White	87 (53%) 3/100,000	88 (50%) 3/100,000	70 (49%) 3/100,000	79 (55%) 3/100,000	84 (56%) 3/100,000
Two or more races	0	2 (1%) 1/100,000	7 (4%) 4/100,000	1 (.7%) 0.6/100,000	0 0
***Hispanic	18 (11%) 10/100,000	29 (32%) 16/100,000	21 (15%) 7/100,000	25 (17%) 13/100,000	25 (17%) 14/100,000
SPECIAL POPULATIONS					
Foreign Born	37 (23%)	37 (21%)	35 (24%)	39 (27%)	38 (26%)
University Students	8 (5%)	5 (3%)	2 (1%)	5 (3%)	2 (1%)
Homeless	7 (4%)	9 (5%)	13 (9%)	8 (6%)	7 (5%)
Nursing Homes	5 (3%)	5 (3%)	5 (3%)	8 (6%)	4 (3%)
AIDS/TB	10 (6%)	4 (2%)	10 (7%)	6 (4%)	5 (3%)
Prisoners	6 (4%)	11 (6%)	8 (6%)	7 (5%)	2 (1%)
BACTERIOLOGY					
Resistance To INH	9 (5.6%)	1 (1%)	5 (5%)	3 (2%)	0
MDR-TB	1 (.8%)	0 (N/A)	1 (1%)	0 (N/A)	0
Culture Positive for MTB	126 (77%)	109 (61%)	93 (65%)	78 (54%)	91 (61%)

*Rate per 100,000
**Race and Age Calculated with 2000 Census Population
***Persons of Hispanic origin are also counted in other races.

Transplantation-Transmitted Tuberculosis, 2007

In 2007, the Oklahoma State Department of Health identified *Mycobacterium tuberculosis* in an organ donor 3 weeks after the donor's death. Disseminated tuberculosis (TB) occurred in two of three transplant recipients from this donor, and one recipient died. Genotypes of the donor and recipient *M. tuberculosis* isolates were identical, consistent with transmission of TB by organ transplantation. To reduce the risk for TB transmission associated with organ transplantation, organ recovery personnel should consider risk factors for TB when assessing all potential donors. In addition, clinicians should recognize that transplant recipients with TB might have unusual signs or symptoms. When transmission is suspected, investigation of potential donor-transmitted TB requires rapid communication among physicians, transplant centers, organ procurement organizations (OPOs), and public health authorities.

The organ donor was a U.S.-born man with a history of seizure disorder and risk factors for tuberculosis such as alcoholism, homelessness, and incarceration. He was admitted to the hospital for presumed alcohol withdrawal seizures and aspiration pneumonitis. He had a prolonged hospitalization characterized by altered mental status, fever, persistent pneumonia, hydrocephalus, multifocal cerebral infarction, and progressive neurologic disability attributed to cerebral vasculitis. The patient continued to decline neurologically and met clinical criteria for brain death in early June 2007. Organs were recovered for transplantation, and the liver and kidneys were transplanted into three recipients. Three weeks after the organ donor's death, a culture from cerebrospinal fluid obtained as part of his clinical evaluation for fever and altered mental status grew *M. tuberculosis*. Subsequently, *M. tuberculosis* also was cultured from stored donor spleen tissue. The donor had been treated for two previous episodes of pneumonia in the 6 months before his death, but no specimen was obtained for acid-fast bacilli (AFB) examination or mycobacterial culture. He had no recognized history of TB or foreign travel and had not been identified as a contact of any person with TB.

One kidney recipient developed fever, pancytopenia and a sepsis-like syndrome 6 weeks after the transplant. *M. tuberculosis* was cultured from the recipient's blood, liver, spleen, and lungs. Despite treatment with anti-TB therapy, the recipient died 9 weeks posttransplantation. The second kidney recipient had fever and severe headache and pancytopenia 7 weeks after transplantation and was started on anti-TB medications. *M. tuberculosis* grew from the recipient's blood and urine specimens. As of this report, the patient was doing well. The liver recipient was started on anti-TB treatment 2 months posttransplantation and has had no symptoms of TB and no *M. tuberculosis* cultured to date. The polymerase chain reaction (PCR)-based genotype and restriction fragment length polymorphism (RFLP) pattern of both kidney recipients' *M. tuberculosis* isolates matched those of the donor.

Contact investigations were conducted to evaluate at-risk healthcare workers, close personal contacts, and family members related to the donor and recipients. No transmission of TB infection has been documented through contact investigation.

The majority of TB cases among organ transplant recipients are caused by activation of preexisting latent tuberculosis infection (LTBI) in the recipient once immunosuppressive medications are started to prevent organ rejection; and, according to one international study, only 4% of TB infections in recipients were considered donor derived (*1*). In this case report, genotyping supported the conclusion that transmission of TB occurred by organ transplantation to two recipients from a common donor. Although organ procurement protocols were followed, pretransplantation screening did not identify TB in the donor.

In the United States, all potential organ donors are screened to prevent transmission of infectious diseases, including TB, by organ transplantation. Minimum standards for donor eligibility are defined by United Network for Organ Sharing (UNOS), a nonprofit, private organization under government contract with the Health Resources and Services Administration to coordinate U.S. transplant activities (*2*). To evaluate eligibility, 1) the donor's medical record is reviewed for specific conditions (such as known active TB), 2) a medical and social history is conducted with next of kin, and 3) a chest radiograph and selected laboratory testing (such as testing for human immunodeficiency virus and hepatitis) are performed. No standard assessment is conducted to determine specifically whether the potential donor is at risk for having previously undiagnosed TB or LTBI. Although the screening process might uncover symptoms or risk

factors for TB or LTBI, no further investigation or diagnostic testing is required. The donor's medical and social history obtained by the OPO is made available for review by transplant center clinicians to independently assess risk for transmission of infection before accepting the organs for transplantation. The completeness and accuracy of this background information is variable, however, because often such information is obtained secondhand by interview of persons familiar with the donor.

Early recognition of posttransplantation TB in the recipient is critical for successful treatment. The incidence of TB among organ recipients is as much as 74 times that of the general population (*1*). In addition, 49% of U.S. transplant recipients with TB have disseminated disease, and 38% die (*1*). Extrapulmonary and disseminated diseases are common, leading to atypical signs that might not be easily recognized as TB if unsuspected by the clinician and attributed to other potential complications, including organ rejection or other infectious diseases. In transplant patients, TB should be considered in the differential diagnosis of persistent fever, pneumonia, meningitis, septic arthritis, pyelonephritis, septicemia, graft rejection, or bone marrow suppression. Clinicians should recognize that the presence of an unusual constellation of symptoms, particularly during the first few weeks after transplantation, raises the possibility of donor-transmitted infection or activation of LTBI. Diagnosis of TB in an organ recipient, in the absence of clear risk factors or other evidence from pretransplantation screening, should prompt investigation of possible transmission from the donor. Other recipients from a common donor might be at risk and should be evaluated for TB. When transplantation-transmitted TB is suspected, health-care providers should alert the associated OPO, tissue bank, and public health authorities.

To prevent TB transmission by transplantation, specific policies can be established to improve recognition of disease in donors. In 2004, the American Society of Transplantation developed guidelines to assist in pretransplantation screening of potential organ donors and recipients (*3,4*). These recommendations are not mandatory standards and, therefore, are not necessarily incorporated into OPO standard operating procedures. OPOs can enhance their pretransplantation screening protocols by incorporating these guidelines to identify risk factors for unrecognized TB in the donor. If risk factors are found, further mycobacterial testing and radiologic assessment is warranted. For risk factor assessment, OPOs should obtain donor history of symptoms consistent with active TB, past diagnosis of TB infection (active or latent), homelessness, excess alcohol or injection-drug use, incarceration, recent exposure to persons with active TB, or travel to areas where TB is endemic. Complete donor medical and social histories should be provided to transplant centers.

Regardless of risk factor assessment, testing for *M. tuberculosis* (e.g., AFB smear or mycobacterial culture) whenever clinical specimens for routine bacterial testing are obtained from donors can help ensure detection of unrecognized TB. In addition, routine retention of samples of donor tissues and serum from organ procurement (or from autopsy) that are suitable for laboratory evaluation can aid subsequent transmission investigations. Genotyping and other relatedness testing of isolates can help establish or rule out transmission links between donor and recipients, as demonstrated in this report. OPOs also should follow up on results of all tests pending at the time of organ donation and notify transplant centers immediately of any results that might have implications for recipients. Rapid recognition of disease transmission through transplantation is critical to facilitate appropriate treatment, minimize complications, enhance patient safety, and improve public health.

References

1. Singh N, Paterson DL. *Mycobacterium tuberculosis* infection in solid-organ transplant recipients: impact and implications for management. Clin Infect Dis 1998;27:1266--77.
2. United Network for Organ Sharing. Minimum procurement standards for an organ procurement organization (OPO). Richmond, VA: United Network for Organ Sharing; 2001. Available at http://www.unos.org/policiesandbylaws/policies.asp.
3. American Society of Transplantation. *Mycobacterium tuberculosis*. Am J Transplant 2004;4(Suppl 10):S37--41.
4. American Society of Transplantation. Screening of donor and recipient prior to solid organ transplantation. Am J Transplant 2004;4 (Suppl 10):S10--20.

Tularemia

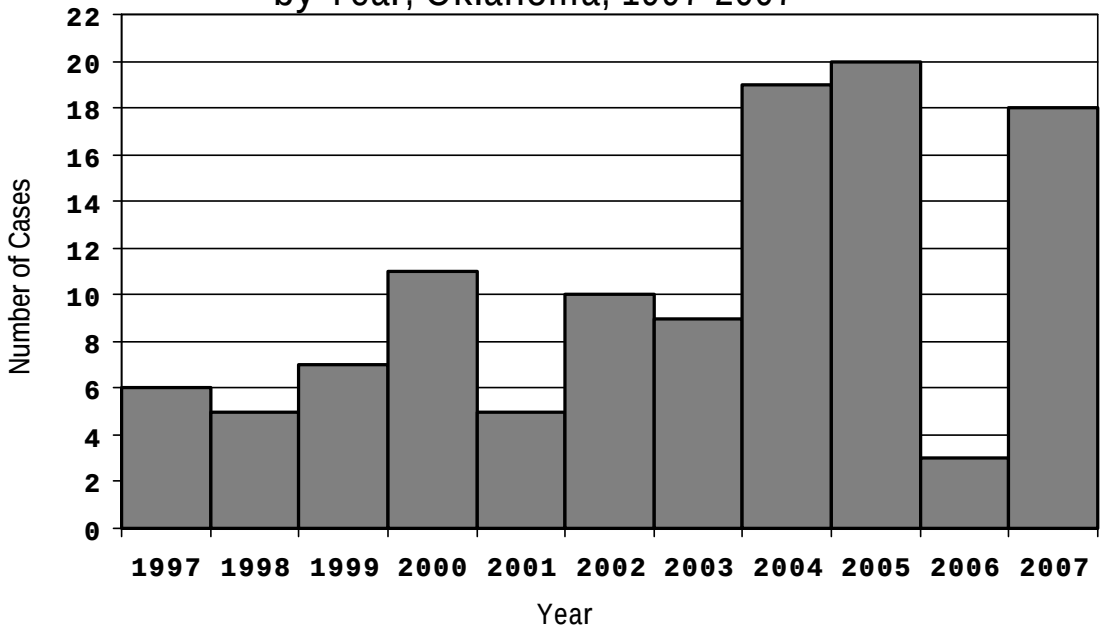
2007 Case Total	18	2007 Rate	0.50 per 100,000
2006 Case Total	3	2006 Rate	0.09 per 100,000

Although tularemia is naturally endemic in Oklahoma, *Francisella tularensis* is classified as a bioterrorism agent and is therefore an immediately notifiable disease. Epidemiologists from the Acute Disease Service investigate all cases upon receipt to identify the source of exposure and evaluate for case clustering or outbreaks. There are many different presentations of tularemia. In 2007, 12 ulceroglandular, 3 glandular, 2 typhoidal, and one oculoglandular primary infections were reported to the Oklahoma State Department of Health. Oklahoma did see a 6-fold increase in reported tularemia cases from 2006 to 2007; however, the low case number in 2006 was consistent across all tickborne diseases in Oklahoma during that year. Although trends in disease are not understood entirely, weather factors like rainfall and temperature do affect tick survival and overall vector population numbers. While cases are reported throughout the year, 67% of the reported cases in 2007 had onsets from May through July. The majority of reported cases were from the eastern part of the state, largely due to its more favorable tick habitat. Sporadic case investigations are important for surveillance activities and provide an opportunity for patient education on tick bite prevention and the safe handling of animals.

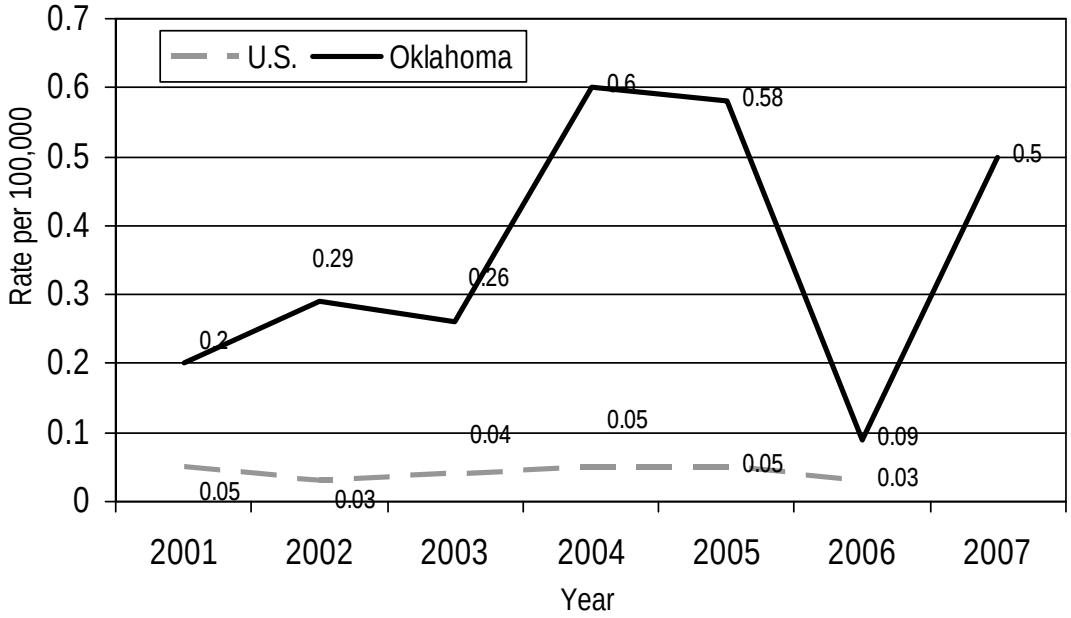
Demographic and Clinical Summary of Reported Tularemia Cases, Oklahoma, 2007 (N=18)

	Number (%)	Incidence rate per 100,000
Gender		
Male	16 (89%)	0.90
Female	2 (11%)	0.11
Age	Median=44Years (Range 3-75 Years)	--
Hospitalized	6(33%)	--
Deaths	1 (6%)	--
Race		
White	14	0.49
Native American/Alaska Native	3	1.05
Native Hawaiian/Pacific Islander	1	27.37
Geographical Distribution		
Adair	1	4.57
Coal	1	17.52
Creek	1	1.45
Garfield	1	1.73
Kingfisher	1	6.98
LeFlore	1	2.01
Muskogee	1	1.41
Oklahoma	2	0.28
Pawnee	4	24.32
Pottawatomie	1	1.45
Rogers	1	1.20
Sequoyah	2	4.88
Washington	1	2.00
Exposures		
Tickbite	11 (61%)	--
Detick animal with bare hands	4 (22%)	--
Perform necropsy	2 (11%)	--
Animal bite	4 (22%)	--

Reported Number of Tularemia Cases by Year, Oklahoma, 1997-2007



Incidence Rate of Reported Tularemia Cases, Oklahoma and United States, 2001-2007



Typhoid Fever

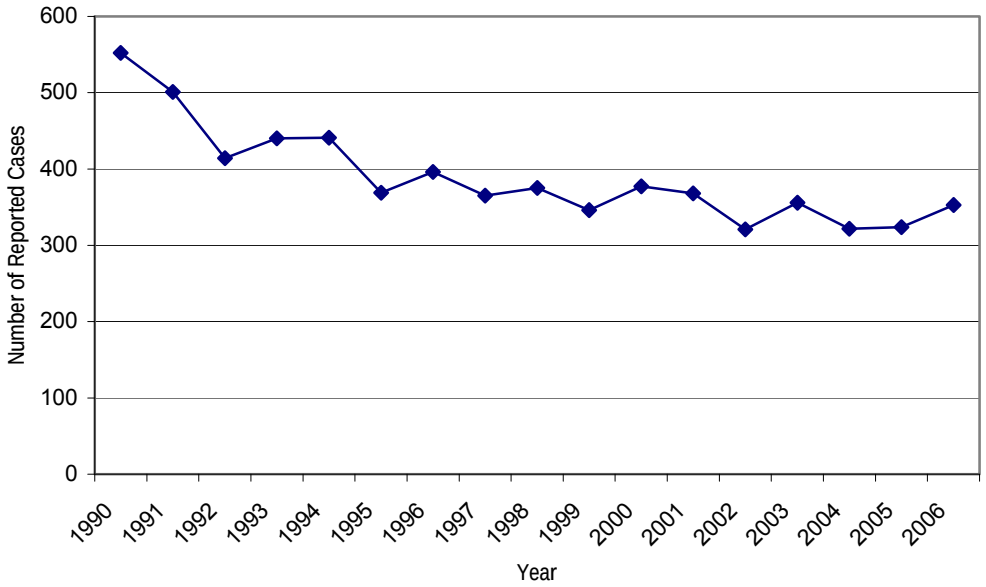
2007 Cases	3	2007 Rate	0.08 per 100,000
2006 Cases	0	2006 Rate	0.00 per 100,000

Cases of Typhoid fever in the United States are the result of importation from endemic countries. Since 1978, the median number of reported cases per year in Oklahoma is two with a range of zero to nine cases. Overall in the United States, the median number of cases per year from 1990 through 2006 is 369 cases with a range of 321 to 552 cases. All three cases reported in Oklahoma residents had a history of travel to typhoid fever endemic areas during their exposure period; two (67%) traveled to India and one case (33%) traveled to Mexico. The median age of the three cases reported in 2007 was 24 years with a range from 2 years to 28 years. Race was reported by two of the three cases of which one reported white (IR = 0.04) and the other Asian (IR = 1.60). Hispanic or Latino ethnicity was reported by one case (IR = 0.38) and non-Hispanic or Latino for the other two cases (IR = 0.38). Two of the cases were hospitalized and no deaths were reported.

Typhoid fever is characterized by a gradual onset of fever, headache, malaise, anorexia, splenomegaly and non-productive cough. Additional symptoms may include rose spots on the trunk and abdominal pain. Two cases reported only experiencing symptoms of fever and diarrhea. In addition to fever and diarrhea, symptoms of the third case included chills, malaise, abdominal cramps and splenomegaly. Typhoid fever was confirmed in all three cases by isolation of *Salmonella typhi* from blood.

The route of transmission for Typhoid fever is fecal – oral and most often is linked to consumption of high-risk foods or contaminated water in an unindustrialized country or region. A vaccine is available for Typhoid fever and is recommended for travelers to areas where the disease is endemic; two cases received the vaccine prior to international travel. However, the vaccine is not 100% effective and avoidance of high-risk foods is still advised. The Centers for Disease Control and Prevention traveler's health website at http://www.cdc.gov/travel/ has useful information for individuals traveling to areas where Typhoid fever is a concern.

Reported Number of Typhoid Fever Cases by Year, United States, 1990 - 2006



Summary: Vomiting/Diarrhea Illness among Residents and Staff of an Assisted Living Center, January 2007

On January 5, 2007, the Oklahoma City-County Health Department (OCCHD) received a call reporting an outbreak of vomiting and diarrhea among residents and staff of a nursing home (NH) located in Midwest City. Three epidemiologists and two sanitarians went to the facility that evening. An inspection of the dining area, one laundry room, one utility closet, the activities room and the kitchen was performed by the sanitarians.

A case was defined as anyone affiliated with the nursing home who, in the absence of other diagnoses, experienced vomiting, diarrhea or both on or after December 24, 2006. According to the case definition, there were 36 cases of vomiting and/or diarrhea found among the nursing home residents (52.9% of the total patient population). Fourteen residents reside in a memory care unit, a wing that is separated from the rest of the facility by a key-coded door, ten of whom (71.4% of the memory care population, 27.8% of ill residents) were ill. Twenty out of 38 staff (78.9%) met the case definition of illness; six family members of staff also met the case definition. Thirteen residents were hospitalized during the time of this illness outbreak, seven of those for gastrointestinal illnesses. The first case of diarrhea/vomiting in the facility occurred in a staff member with onset of symptoms beginning on December 24, 2006. The outbreak peaked on January 2nd with 12 cases, with the last known case reporting onset of symptoms on January 9th.

Symptoms for Residents, Staff and Family Members of Staff of MWC Nursing Home, Gastroenteritis Outbreak Investigation, January 2007.

Symptoms	Residents	Staff	Family	Total (%)
Diarrhea	14	4	1	19 (30.6)
Vomiting	1	0	2	2 (3.23)
Vomiting/Diarrhea	18	16	3	37 (59.7)
Unknown	3	0	1	4 (6.45)
Total	36	20	6	62 (100)

Symptoms experienced by residents, staff and family members were indicative of an acute viral gastroenteritis. Many of these illnesses have an incubation period of between 24 and 48 hours but cases can occur within 12 hours of exposure. Symptoms usually last 24 to 60 hours. Four stool samples were tested and were negative for bacterial pathogens and norovirus. Environmental swabs were collected in various areas around the dining area, kitchen and activity room. All samples tested were negative for bacterial or viral pathogens.

With the exception of the memory care residents, residents were highly mobile. Residents have freedom of movement about the facility, including access to dining facilities around the clock and different types of social activities, such as jigsaw puzzles and bingo gaming pieces. This freedom of movement undoubtedly increased the risk of spread of illness from patient to patient, from patient to staff and vice versa. Residents were encouraged to leave the facility for meals and family visits. Another possible source of infection is visitors to the facility during the holiday period.

This outbreak may have resulted from person-to-person transmission. No agent or vehicle of transmission was identified. This outbreak was self-limiting; no additional cases were reported after January 9, 2007. Since norovirus and other viral gastrointestinal illnesses are easily spread from person to person, particularly in closed populations, the virus can spread quickly throughout the facility once introduced to staff and residents. Once an outbreak is recognized, it is vital to initiate strict isolation of ill patients and staff, review standard precaution guidelines as well as proper hand hygiene and personal hygiene practices and initiate appropriate cleaning of the facility.

West Nile Virus

2007 Case Total	107	2007 Rate	2.9 per 100,000
2006 Case Total	48	2006 Rate	1.4 per 100,000

Since national surveillance began nine years ago, there have been a total of 27,605 human cases of West Nile (WN) disease with 1,086 deaths reported in the United States; WN virus infections have now been reported in animals or people from all 48 contiguous states, Canada and Mexico. In 2007, a total of 3,630 human cases of WN disease and 124 associated deaths were reported to the CDC by 43 states representing a 15% decrease in cases as compared to 2006. Most of the 2007 WN virus activity was seen in the central and mountain states with the highest number of cases reported from Colorado (576), California (380) and North Dakota (369).

Nationally, Oklahoma ranked eleventh in the total number of cases reported and was third in the total number of fatalities. The statewide incidence of human WN disease was 107 cases of WN Fever or WN neuroinvasive disease (3 per 100,000) resulting in a sharp (123%) increase over the previous season. This also marked the highest annual incidence of WN disease since it was identified in Oklahoma in 2002.

Reported cases were distributed across 32 counties with geographic clustering in the northwestern and northeastern regions of the state. Counties with the highest incidence rates per 100,000 population included Cimarron (37.5), Ellis (25.6), Nowata (18.7) and Woodward (15.4). Tulsa County had the highest number of WN cases by county (34) and the county incidence rate in 2007 (5.8 per 100,000) was over five-fold of that reported in 2006 (0.8 per 100,000).

The rate of WN disease in those 70 years of age and older (10.5 per 100,000) was three and a half times greater than the overall incidence rate. While persons of any age may develop symptoms of disease, those over the age of 50 are at greater risk of developing WN neuroinvasive disease. Symptom onsets of all reported cases ranged from June 7 to November 29, 2007. Seventy-three percent (78) of cases were hospitalized and 5% of cases developed acute flaccid paralysis. There were eight fatalities that ranged in age from 60 to 88 years of age.

Seasonality of WN disease in Oklahoma frequently follows a bimodal epidemiologic curve with primary peak activity occurring in August followed by a smaller peak in late September and additional cases occurring into October. In 2007, the greatest number of cases was reported in August (56) followed by September (31); the last case of the season had onset at the end of November. In previous seasons, more intense WN activity has been associated with above average high temperatures followed by a period of drought. In contrast, the 2007 WN activity immediately succeeded relatively cool temperatures and heavy rain in the late spring and early summer.

Due to the risk of WN virus transmission through contaminated blood or blood products, blood collection facilities routinely perform nucleic acid amplification testing (NAT) to screen donors for WN viremia. Donations from NAT-positive donors are excluded. These individuals are interviewed further to determine if WN virus-associated symptoms develop. In 2007, 38% (7/18) of viremic blood donors developed symptoms of WN disease.

Physicians should consider WN disease in their differential diagnosis of patients with clinically compatible illness of WN fever or WN neuroinvasive disease. It is recommended that they perform diagnostic serologic testing. Most commercial laboratories offer WN virus antibody testing (IFA or EIA). When interpreting these test results, a positive IgM component is generally indicative of an acute infection even in absence of an IgG response. A positive IgG result without concomitant IgM seroreactivity more likely represents a prior exposure to WN virus that resulted in a subclinical infection.

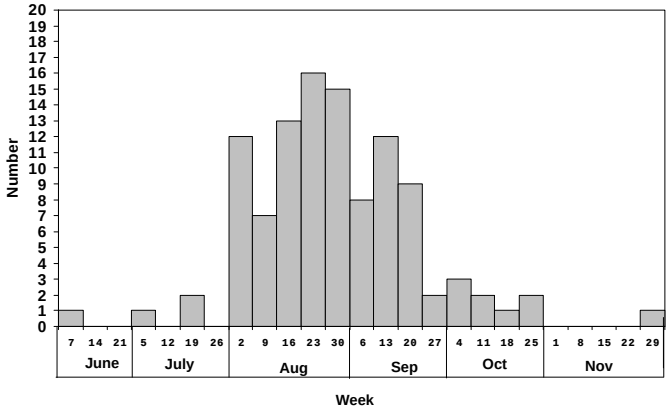
Demographic and Clinical Summary of Reported West Nile Virus Cases, Oklahoma, 2007 (N = 107)

	Number (%)	Incidence rate per 100,000
Gender		
Male	61 (57%)	3.4
Female	46 (43%)	2.5
Age (years)	Median = 58 (range 1-97)	--
Race (N=103)		
White	94 (91%)	3.3
African American	5 (5%)	1.7
American Indian or Alaska Native	4 (4%)	1.4
Hispanic Ethnicity (N=105)	2 (2%)	0.8
Infection Type		
West Nile fever	47 (44%)	--
Neuroinvasive	60 (56%)	--

Oklahoma Counties with Highest Rates* of Reported Human WN Disease; 2007 and Cumulative 2002-2007

2007		Counties with Highest West Nile Disease Incidence Rates; 2002-2007	
County	Rate	County	2002-2007 Rate
Cimarron	37.5	Texas	139.3
Ellis	25.6	Beaver	102.4
Nowata	18.7	Cimarron	95.3
Woodward	15.4	Grant	58.3
Texas	15.0	Ellis	49.1
Hughes	14.6	Carter	39.5
Carter	12.6	Woods	33.0
Tillman	12.3	Roger Mills	29.1
Love	11.0	Nowata	28.4
Okmulgee	10.2	Okmulgee	27.7
State Total	2.9	State Total	8.9

Reported West Nile Disease by Week of Symptom Onset, Oklahoma - 2007



Syndromic Surveillance Systems in Oklahoma and Tulsa County

The Tulsa Health Department (THD) and Oklahoma City-County Health Department (OCCHD) utilize syndromic surveillance systems to monitor Emergency Department (ED) chief complaints to identify outbreaks or unusual disease presentations. Syndromic surveillance systems categorize ED chief complaint data into syndromes to assess temporal trends to determine whether the frequency of ED visits increased due to a particular syndrome. Examples of syndrome categories include meningitis, respiratory illness, gastrointestinal, influenza-like illness, and rash illness.

Tulsa Area Syndromic Surveillance System

The use of syndromic surveillance in Tulsa County began as an attempt to identify symptoms associated with Category A bioterrorism agents, namely Anthrax. The underlying premise for the system was the hope that an astute clinician, upon observing clusters of cases exhibiting certain symptoms, would rapidly notify the local health department so that an epidemiological investigation could be initiated. The system was also designed to send spatial and temporal alerts when cases of pre-defined syndromes are observed. These syndromes include fever, vomit and respiratory illnesses.

Under an agreement with local hospitals, daily electronic data is transmitted from nine hospitals to the health department. Data collected includes the patient's self-reported chief complaint; patient demographics such as age, sex, zip code; and a unique identifier assigned by the hospital. Each day the data is analyzed and is reviewed by THD staff.

Since the Tulsa Area Syndromic Surveillance Systems' (TASSS) inception in 2002, Tulsa Health Department has looked for other ways to integrate syndromic surveillance into its daily operations, and to expand its focus from an exclusive bioterrorism tool, to one that is broader in scope. One such way has been to utilize the system to identify other syndromes and conditions. In 2007, THD staff began tracking the occurrence of heat-related illnesses during the summer months. This was done because of the anticipated increased emergency room visits with heat-related complaints such as dehydration, cramps and loss of consciousness. Based on the reported chief complaints from 2002-2006, along with CDC case definitions for certain heat-related illnesses, syndrome definitions were created for the following: heat cramps, heat syncope, dehydration, heat exhaustion, heat stroke and heat edema. Alerts were created to notify staff of each occurrence of these syndromes. Upon review of the results, daily and/or weekly results were reported to the local Emergency Medical System (EMS Coordinator. THD posts hospital specific and combined TASSS summaries daily on the Tulsa Biowatch website at http://www.tulsabiowatch.com/public_surveillance_info/city-county_surveillance.htm.

Oklahoma County Health Alert System

The OCCHD syndromic surveillance system, Oklahoma County Health Alert System (OCHAS), is a tool utilized by epidemiologists to detect outbreaks or a bioterrorist event earlier than is possible with traditional disease surveillance systems. Chief complaints (symptoms) reported by individuals seen at nine major hospital EDs in Oklahoma City are reported to OCCHD on a daily basis. Syndrome specific temporal and spatial alarms are generated when daily visits exceed the expected threshold.

In 2007, OCCHD reported temporal alarms as follows: fever (n=27) gastrointestinal (n=16), rash (n=19) and vomit (n=26). During February 2007, a citywide temporal alarm for vomit was sustained for seven days and fever for six days; the increase was seen predominantly in children aged 1 to 5 years and an investigation found that hospital EDs were seeing an increase of gastroenteritis and influenza in this age group.