

## { Hotel Associated Legionellosis Outbreak, March 2004 }

On March 20, 2004, Oklahoma public health officials were notified of a cluster of persons ill with symptoms of headache, fever, myalgias, shortness of breath, and fatigue and one hospitalized person with a urinary antigen assay positive for *Legionella pneumophila* serogroup 1. All ill persons were attending a national basketball tournament and were guests at a particular hotel (hotel A) during the week of March 15–21, 2004. The Oklahoma State Department of Health, in collaboration with the Oklahoma City-County Health Department, Texas Department of Health, Indiana State Department of Health, and the Centers for Disease Control and Prevention investigated a respiratory illness outbreak caused by the bacterium *Legionella pneumophila*.

A retrospective cohort study was conducted with the objectives to: **(1)** determine the magnitude of the outbreak; **(2)** identify the mode(s) of transmission for *Legionella* through an epidemiologic and environmental investigation; and **(3)** institute measures to prevent further transmission. To identify cases, we attempted to interview all persons that stayed at Hotel A at least one evening from March 15 through March 22, and all employees that worked at least one shift at the hotel during the same dates. Hotel management provided a list of registered hotel guests as well as a list of hotel employees. Members of the investigation team attempted to contact registrants and guests who had stayed with a registrant by telephone and administer a 6-page questionnaire to elicit information regarding illness and exposure to potential sources of *Legionella*.

A confirmed case of Legionnaires' disease (LD) was defined as chest radiograph-confirmed pneumonia and laboratory confirmation of *Legionella* infection in a hotel guest or employee who visited the hotel from March 15 through March 22 with onset of illness within 10 days of visiting the hotel. Laboratory confirmation consisted of at least one of the following: **(1)** isolation of *Legionella* from lung tissue, respiratory secretions, pleural fluid, blood or other sterile site specimen; **(2)** detection of *Legionella pneumophila* serogroup 1 (Lp-1) antigen in urine; or **(3)** demonstration of a fourfold or greater rise greater than or equal to 256 in *Legionella* serogroup-specific antibody titer between acute and convalescent-phase serum specimens. A case of Pontiac fever (PF) was defined as subjective fever or chills and at least 1 other symptom of headache, cough, shortness of

breath, muscle aches, vomiting or diarrhea in a hotel guest or employee who visited the hotel from March 15 through March 22 with onset of illness at least within 3 days of visiting the hotel.

We were able to contact 144 of the 180 (**80%**) guests registered at the hotel between March 15 and March 22. Thirty-six (**20%**) individuals listed on the hotel register could not be contacted due to insufficient or inaccurate contact information. Questionnaires were administered to **317** registrants, guests who had stayed with a registrant, and hotel employees. A total of **107** persons met case definitions, including **five** people that met the case definition for LD, **one** person that met the probable case definition for LD, and **101** individuals that met the case definition for PF (overall attack rate **33.7%**). Cases reported an onset of symptoms from March 14 through March 23 (Figure 1). The single case with illness onset of March 14 was a guest at Hotel A from March 14 through March 16. The majority of cases occurred on March 19 with **49.5 %** of case onsets occurring on this date. Cases were residents of 8 states; 61 from Texas (**57%**), 29 from Oklahoma (**27.1%**), 10 from Indiana (**9.3%**), 2 from Missouri (**1.9%**), and **1** from Arkansas, Illinois, Michigan, and North Dakota. The median age of cases was 15 years and ranged from 2 years to 65 years compared to a median age of 36 years and a range of 11 months to 82 years among non-cases (Wilcoxon Rank Sum Test  $X^2 = 21.13$ ,  $p$ -value  $< 0.05$ ).

Univariate analysis of Hotel A exposures revealed several pool-related activities associated with illness. Cases were significantly more likely to have spent time in the pool area than non-cases (RR = 3.38,  $p$ -value  $< 0.01$ ). Cases were significantly more likely to report swimming in the hotel pool (RR = 3.21,  $p$ -value  $< 0.01$ ) and using the hotel hot tub (RR = 2.82,  $p$ -value  $< 0.01$ ). **Eighty-three** percent of cases reported at least one exposure of spending time in the hotel pool area, swimming in the hotel pool, or using the hotel hot tub compared to only **38 %** of non-cases (RR = 4.39,  $p$ -value  $< 0.01$ ). Analysis of reported exposures to the computer room, breakfast area, and fitness area did not reveal any significant difference between cases and non-cases.

We conducted tests for trend to determine whether as exposures increased, the risk of illness increased. There were significant relationships between increasing time in the hotel pool area ( $X^2 = 83.05$ ,  $p$ -value  $< 0.01$ ), swimming in the hotel pool ( $X^2 = 59.01$ ,  $p$ -value  $< 0.01$ ), or using the hotel hot tub ( $X^2 = 26.21$ ,  $p$ -value  $< 0.05$ ) and development of LD or Pontiac fever (see Table One). There were no relationships between increasing time in common areas of the hotel and development of illness.

Outbreak of Legionnaires' Disease and Pontiac Fever cont...

Epidemiologic findings of the retrospective cohort study were supported by environmental assessments that indicated a lack of daily monitoring and maintenance of the pool and spa, which compromised halogen levels and allowed for the growth and proliferation of *Legionella*, the presence of *L. pneumophila* in environmental samples, and the lack of other common exposures among ill guests during March 15 through March 20.

Legionellosis can present as **two distinct clinical entities: Pontiac fever**, a self-limited, non-pneumonic, flu-like illness, and **Legionnaires' disease**, the more severe form of legionellosis involving pneumonia. Given the ubiquity of *Legionella* in freshwater environments, it is possible that many cases of PF may go unrecognized as a result of its relatively mild, non-specific symptoms and lack of widely available confirmatory laboratory tests. The hotel pool area was in heavy use during March 15 through March 20 due to several large groups staying at the hotel. On March 18, there were no measurable bromine levels in the pool or spa and both were hyperbrominated as well as shocked with lithium hypochlorite. Similar to previous outbreaks, inadequate maintenance of the hotel pool and spa along with a high bather load most likely compromised halogen concentrations, which provided an opportunity for *Legionella* growth and transmission. Compliance with the state regulations for daily testing of disinfectant levels in pools and spas is necessary to identify inadequate levels and prevent legionellosis.

\* prepared by **Laurence Burnsed**, MPH, Assistant Director, CDD, OSDH

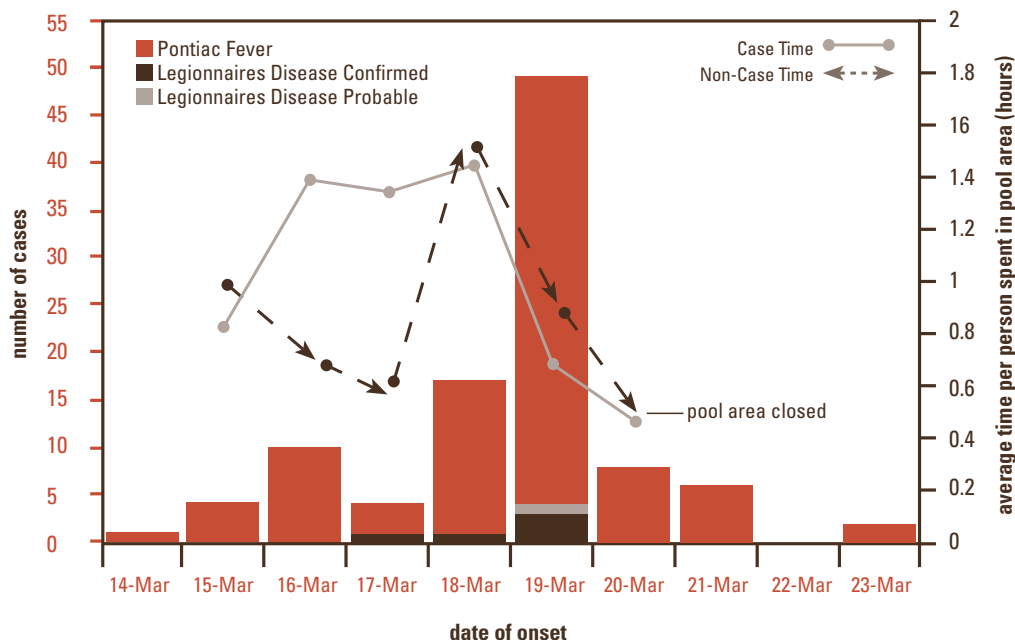
{ **Methicillin-resistant *Staphylococcus aureus* Skin Infections: Prevention and Treatment** }

The **Communicable Disease Division (CDD)** of the Oklahoma State Department of Health (OSDH) and similar divisions across the nation have been receiving reports of **multi-drug resistant organisms (MDROs)** such as **methicillin-resistant *Staphylococcus aureus* (MRSA)** in many non-hospital settings. Although the Oklahoma notifiable disease rules (310 O.A.C. § 315 Subchapter 1 et. seq.) do not require individual cases of *Staphylococcus*, including MRSA, to be reported to the OSDH, some concerns have arisen regarding its emergence in the community. Giving accurate, clear and consistent advice to the public and to healthcare providers is important in preventing spread of infection as well as unnecessary worry.

Several characteristics differentiate **healthcare-associated MRSA (HA-MRSA)** from **community-associated MRSA (CA-MRSA)**<sup>1</sup>. **HA-MRSA** has been recognized since the 1960's, is typically found to be resistant to multiple antibiotics besides methicillin, and is associated with many types of infection, often invasive. **CA-MRSA** has been documented since the 1990's, is usually found to be sensitive to many antibiotics, and is most often associated with skin and soft tissue infections. The Panton-Valentine leukocidin gene found in both MRSA and methicillin-sensitive *S. aureus* (MSSA) can cause a spider bite appearance due to the cytotoxin production causing tissue necrosis.

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**Figure One: Illness Onset of Cases and Average Number of Hours Spent in the Pool Area Among Cases and Non-cases, Legionellosis Outbreak Investigation, Oklahoma, March 2004**



**Table One: Dose Response Association of Hotel A Exposures and Legionnaires' Disease and Pontiac Fever, Legionellosis Outbreak Investigation, Oklahoma, March 2004**

Exposure	Case no. (%)	Non-case no. (%)	Odds Ratio	X <sup>2</sup>	p-value
<b>Exposure to the pool area</b>					
None	41 (38%)	176 (84%)	1.00	83.05	<0.01
< 2 hours	27 (25%)	28 (13%)	4.14		
> 2 hours	39 (36%)	6 (2.8%)	27.90		
<b>Swam in hotel pool</b>					
None	44 (41%)	173 (82%)	1.00	59.01	<0.01
< 2 hours	48 (45%)	28 (13%)	5.55		
> 2 hours	15 (14%)	6 (2.8%)	19.66		
<b>Used hotel hot tub</b>					
None	60 (56%)	177 (84%)	1.00	26.21	<0.05
< 1 hour	42 (39%)	29 (13%)	4.27		
> 1 hour	5 (5%)	4 (2%)	3.69		
<b>Pool Exposures Combined*</b>					
None	19 (18%)	137 (65%)	1.00	114.91	<0.01
< 2 hours	21 (20%)	60 (29%)	2.52		
> 2 hours & ≤ 4 hours	39 (36%)	10 (5%)	28.12		
> 4 hours	28 (26%)	3 (2%)	67.30		

\* Pool exposures combined includes exposure to the pool area only, swimming in the hotel pool, and/or using the hotel hot tub

*Methicillin-resistant Staphylococcus aureus Skin Infections cont...*

In response to calls regarding skin infections, the CDD epidemiologists provide advice regarding prevention of transmission based on the situation. In some exceptional cases, site investigations have been performed which have usually indicated typical person-to-person transmission rather than common-source outbreaks.

**✳ Current recommended treatment and prevention guidelines include the following:**

- 1 For uncomplicated skin lesions in individuals without other risk factors, recommended treatment is incision and drainage along with scrupulous wound care and patient education about contact transmission.
- 2 For more complicated cases where systemic symptoms such as fever are present, or continued infections, or in patients with other risk factors, consultation with an infectious disease physician is recommended.
- 3 Antibiotics are not recommended in most uncomplicated cases, and vancomycin is not recommended for noninvasive infections.
- 4 Eradication of colonization is discouraged in most cases.
- 5 There is no evidence to support excluding persons colonized with MRSA from community activities as a means of limiting transmission.

A fact sheet titled *"Bacterial Skin Infections"* was developed this fall, and is available on the OSDH CDD website<sup>2</sup>. A policy for MDRO's in school and daycare settings and an algorithm for treatment of skin lesions are being developed and will also be available on the website. A similar algorithm was developed by the Washington State Department of Health, and may be accessed online<sup>3</sup>. The new CDC guidelines for infection control for hospitals and all other types of healthcare settings will be finalized in the near future.

Please feel free to consult with CDD epidemiologists at any time, especially if a cluster of infections is suspected. Thank you for your hard work and collaboration in addressing this topic.



\* prepared by **Becky Coffman**, RN, MPH, CIC, Epidemiologist, OSDH

<sup>1</sup> Naimi, T. et al., Comparison of Community- and Health Care- Associated Methicillin-Resistant Staphylococcus aureus Infection, JAMA 290(22): 2976-2984, 2003

<sup>2</sup> Oklahoma State Department of Health, Communicable Disease Division, Bacterial Skin Infections, October 2004 <<http://www.health.state.ok.us/program/cdd/MRSAFactSheet.pdf>>

<sup>3</sup> Washington State Department of Health, Interim Guidelines for Evaluation & Management of Community Associated Methicillin Resistant Staphylococcus aureus Skin and Soft Tissue Infections in Outpatient Settings, September 2, 2004 <<http://www.doh.wa.gov/Topics/Antibiotics/MRSAinterimGuide.doc>>

Antibiotic susceptibility of invasive *Streptococcus pneumoniae* cont...

Hospital	Suscept.*	# Penicillin %	# Ceftriaxone %	# Cefotaxime %	# Erythromycin %	# TMP/SMZ %	total # of isolates submitted
<b>OTHER PARTICIPATING HOSPITALS</b>							
Ada-Carl Albert Indian Health Facility	S I R	13/16 (80) <sup>d,e</sup> 2/16 (13) 1/16 (6)	15/15 (100) <sup>d</sup>	11/11 (100) <sup>b</sup>	7/8 (88) <sup>b</sup> 1/8 (13)	8/11 (73) <sup>b</sup> 1/11 (9) 2/11 (19) <sup>b</sup>	16
Ardmore-Mercy Mem.	S I R	71/91 (78) <sup>e</sup> 17/91 (19) 3/91 (3)	50/50 (100) <sup>e</sup>	85/87 (98) <sup>e</sup> 2/87 (2)	2/3 (67) <sup>d</sup> 1/3 (33)	2/3 (67) <sup>d</sup> 1/3 (33)	91
Bartlesville-Jane Phillips	S I R	24/28 (86) <sup>d,o</sup> 4/28 (14)	25/25 (100) <sup>e</sup>	21/21 (100) <sup>e</sup>	18/27 (67) <sup>d</sup> 2/27 (7) 7/27 (26)	12/25 (48) <sup>d</sup> 13/25 (52)	28
Duncan Regional	S I R	4/7 (57) <sup>e,o</sup> 3/7 (43)	5/6 (83) <sup>e</sup> 1/6 (17)		3/7 (43) <sup>d</sup> 4/7 (57)	4/7 (57) <sup>d</sup> 3/7 (43)	7
Enid-St. Mary's	S I R	51/70 (73) <sup>d,e</sup> 10/70 (14) 9/70 (13)	54/62 (87) <sup>e</sup> 8/62 (13)	37/45 (82) <sup>e</sup> 8/45 (18)	33/41 (81) <sup>e</sup> 6/41 (15) 2/41 (5)	1/1 (100) <sup>e</sup>	70
Lawton-Comanche Co.	S I R	36/57 (63) <sup>b,m</sup> 6/57 (11) 15/57 (26)	44/55 (80) <sup>b,m</sup> 8/55 (15) 3/55 (6)	40/51 (78) <sup>b,m</sup> 8/51 (16) 3/51 (6)	27/48 (56) <sup>m</sup> 21/48 (44)	26/46 (57) <sup>m</sup> 20/46 (44)	57
McAlester Regional	S I R	37/48 (77) <sup>e,o</sup> 8/48 (17) 3/48 (6)	21/21 (100) <sup>e</sup>		9/17 (53) <sup>e</sup> 2/17 (12) 6/17 (35)	7/17 (41) <sup>e</sup> 5/17 (29) 5/17 (29)	48
McCurtain Memorial	S I R	5/6 (83) <sup>e,m</sup> 1/6 (17)	6/6 (100) <sup>m</sup>	4/5 (80) <sup>m</sup> 1/5 (20)	5/6 (83) <sup>m</sup> 1/6 (17)	3/6 (50) <sup>m</sup> 2/6 (33) 1/6 (17)	6
Muskogee Regional	S I R	73/89 (82) <sup>m</sup> 10/89 (11) 6/89 (7)	78/82 (95) <sup>m</sup> 4/82 (5)	77/84 (91) <sup>m</sup> 7/84 (9)			89
Muskogee-VA	S I R	19/22 (86) <sup>d,e</sup> 2/22 (9) 1/22 (5)	4/4 (100) <sup>d</sup>	1/1 (100)	16/18 (89) <sup>d</sup> 2/18 (11)	11/18 (61) <sup>d</sup> 2/18 (11) 5/18 (28)	22
Pauls Valley	S I R	13/21 (62) <sup>d,o</sup> 5/21 (24) 3/21 (14)	8/8 (100) <sup>d</sup>	1/2 (50) <sup>d</sup> 1/2 (50)	2/6 (33) <sup>d</sup> 4/6 (67)	4/6 (67) <sup>d</sup> 2/6 (33)	21
Shawnee-Unity Health	S I R	53/74 (72) <sup>d,e,m,o</sup> 7/74 (10) 14/74 (19)	56/66 (85) <sup>e,m</sup> 8/66 (12) 2/66 (3)	40/50 (80) <sup>m</sup> 10/50 (20)	46/72 (64) <sup>d,e,m</sup> 3/72 (4) 23/72 (32)	45/71 (64) <sup>d,e,m</sup> 6/71 (9) 20/71 (28)	74
Stillwater	S I R	45/69 (65) <sup>d,e</sup> 12/69 (17) 12/69 (17)	65/67 (97) <sup>e</sup> 2/67 (3)	1/1 (100) <sup>e</sup>	42/68 (62) <sup>d</sup> 1/68 (2) 25/68 (37)	41/65 (63) <sup>d</sup> 1/65 (2) 23/65 (35)	69
<b>OTHER PARTICIPATING HOSPITALS TOTAL</b>	S I R	444/598 (74) 86/598 (14) 68/598 (11)	431/467 (92) 31/467 (7) 5/467 (1)	318/358 (89) 36/358 (10) 4/358 (1)	210/321 (65) 15/321 (5) 96/321 (30)	164/274 (60) 17/274 (6) 95/274 (34)	598
<b>TOTAL</b>	S I R	1411/1978 (71) 340/1978 (17) 227/1978 (12)	1261/1352 (93) 74/1352 (6) 17/1352 (1)	910/1064 (86) 120/1064 (11) 34/1064 (3)	947/1315 (72) 20/1315 (2) 348/1315 (27)	572/931 (61) 57/931 (6) 302/931 (34)	1978

“ Giving accurate, clear & consistent advice to the public & to healthcare providers is important in **P R E V E N T I N G** spread of infection... ”

{ Antibiotic susceptibility of invasive *Streptococcus pneumoniae* isolates from sentinel surveillance laboratories, 01.98 - 07.04 } \*\*

Hospital	Suscept.*	# Penicillin %	# Ceftriaxone %	# Cefotaxime %	# Erythromycin %	# TMP/SMZ %	total # of isolates submitted
<b>OKC AREA</b>							
Columbia Bethany	S I R	4/5 (80) <sup>e</sup> 1/5 (20) <sup>e</sup>	3/3 (100) <sup>e</sup>	1/2 (50) <sup>e</sup> 1/2 (50)	3/3 (100) <sup>d</sup>		5
Deaconess	S I R	47/69 (68) <sup>b,e</sup> 15/69 (22) 7/69 (10)	67/69 (97) <sup>e</sup> 1/69 (1) 1/69 (1)		22/27 (82) <sup>d</sup> 5/27 (19)	1/1 (100) <sup>d</sup>	69
Integrus Baptist	S I R	134/203 (66) <sup>d,e</sup> 41/203 (20) 28/203 (14)	188/201 (94) <sup>e</sup> 12/201 (6) 1/201 (1)	3/3 (100)	137/202 (68) <sup>d</sup> 65/202 (32)	5/8 (63) <sup>d</sup> 3/8 (38)	203
Integrus Southwest	S I R	93/127 (73) <sup>d,e</sup> 21/127 (17) 13/127 (10)	116/123 (94) <sup>e</sup> 7/123 (6)	3/3 (100) <sup>e</sup>	89/123 (72) <sup>d</sup> 34/123 (28)	1/2 (50) 1/2 (50) <sup>d</sup>	127
Mercy	S I R	56/90 (62) <sup>e</sup> 18/90 (20) 16/90 (18)	32/39 (82) <sup>e</sup> 4/39 (10) 3/39 (8)	37/52 (71) <sup>e</sup> 8/52 (15) 7/52 (14)	1/1 (100) <sup>e</sup>	6/22 (27) <sup>e</sup> 1/22 (5) 15/22 (68)	90
Midwest Regional	S I R	84/124 (68) <sup>e</sup> 33/124 (27) 7/124 (6)	6/7 (86) 1/7 (14) <sup>e</sup>	86/118 (73) <sup>e</sup> 25/118 (21) 7/118 (6)	12/13 (92) <sup>d</sup> 1/12 (8)		124
Norman Regional	S I R	63/97 (65) <sup>e,o,m</sup> 17/97 (18) 17/97 (18)	95/97 (98) <sup>e</sup> 2/97 (2)	43/47 (92) <sup>e</sup> 3/47 (6) 1/47 (2)	58/84 (70) <sup>d</sup> 25/83 (30)	52/82 (62) <sup>e</sup> 4/84 (5) 28/84 (33)	97
OU Medical Center Children's	S I R	65/109 (60) <sup>b</sup> 30/109 (28) 14/109 (13)	2/2 (100)	95/109 (87) <sup>b</sup> 9/109 (8) 5/109 (5)	72/107 (67) <sup>b</sup> 2/107 (2) 33/107 (31)	59/109 (54) <sup>b</sup> 9/109 (8) 41/109 (38)	109
OU Medical Center Everett Tower	S I R	53/75 (71) <sup>b</sup> 13/75 (17) 9/75 (12)		69/75 (92) <sup>b</sup> 4/75 (5) 2/75 (3)	56/75 (75) <sup>b</sup> 19/75 (25)	47/75 (63) <sup>b</sup> 4/75 (5) 24/75 (32)	75
St. Anthony	S I R	70/86 (81) <sup>b,d,o</sup> 9/86 (11) 7/86 (8)	76/79 (96) <sup>e</sup> 2/79 (3) 1/79 (1)	1/1 (100) <sup>e</sup>	69/84 (82) <sup>d</sup> 15/84 (18)	63/85 (74) <sup>d</sup> 2/85 (2) 20/85 (24)	86
VA-OKC	S I R	26/34 (77) <sup>b,d,o</sup> 3/34 (9) 5/34 (15)	10/11 (91) <sup>e</sup> 1/11 (9)	30/33 (91) <sup>e</sup> 2/33 (6) 1/33 (3)	24/33 (73) <sup>d</sup> 9/33 (27)	22/31 (71) <sup>d</sup> 1/31 (3) 8/31 (26)	34
<b>OKC AREA TOTAL</b>	<b>S I R</b>	<b>695/1019 (68) 200/1019 (20) 124/1019 (12)</b>	<b>595/631 (94) 30/631 (5) 6/631 (1)</b>	<b>368/443 (83) 52/443 (12) 23/443 (5)</b>	<b>542/751 (72) 2/751 (1) 207/751 (28)</b>	<b>256/417 (61) 21/417 (5) 140/417 (34)</b>	<b>1019</b>
<b>TULSA AREA</b>							
Hillcrest	S I R	54/62 (87) <sup>o</sup> 6/62 (10) 2/62 (3)	59/60 (98) <sup>o</sup> 1/60 (2)		32/38 (84) <sup>o</sup> 6/38 (16)	29/37 (78) <sup>o</sup> 2/37 (5) 6/37 (16)	62
St. Francis	S I R	57/88 (65) <sup>d,e</sup> 22/88 (25) 9/88 (10)	2/2 (100) <sup>e</sup>	71/86 (83) <sup>de</sup> 13/86 (15) 2/86 (2)			88
St. John	S I R	156/205 (76) <sup>d,e,o</sup> 25/205 (12) 24/205 (12)	168/186 (90) <sup>e</sup> 12/186 (7) 6/186 (3)	147/171 (86) <sup>e</sup> 19/171 (11) 5/171 (3)	157/199 (79) <sup>d,e</sup> 3/199 (2) 39/199 (20)	121/195 (62) <sup>d</sup> 16/195 (8) 58/195 (30)	205
St. John Sapulpa (Bartlett Memorial)	S I R	5/6 (83) <sup>e</sup> 1/6 (17)	6/6 (100) <sup>e</sup>	6/6 (100) <sup>e</sup>	6/6 (100) <sup>d</sup>	2/6 (33) <sup>d</sup> 1/6 (17) 3/6 (50)	6
<b>TULSA AREA TOTAL</b>	<b>S I R</b>	<b>272/361 (75) 54/361 (15) 35/361 (10)</b>	<b>235/254 (93) 13/254 (5) 6/254 (2)</b>	<b>224/263 (85) 32/263 (12) 7/263 (3)</b>	<b>195/243 (80) 3/243 (1) 45/243 (19)</b>	<b>152/238 (64) 19/238 (8) 67/238 (28)</b>	<b>361</b>

\*\* Preliminary data as of 11.30.04

\* Susceptibility: S = Sensitive, I = Intermediate, R = Resistant

Susceptibility Method: a Agar Dilution      d Bacterial Disk Diffusion (Kirby Bauer)      m Antimicrobial panel (MicroScan ®)  
 b Bacterial Broth Dilution      e Antimicrobial Gradient Strip (E-test ®)      o Oxacillin Disk Only

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{ Summary of Selected Notifiable Disease Reports in Oklahoma }

diseases/conditions	cases spring qtr <sup>1</sup>	year to date <sup>2</sup>	5 year avg. <sup>3</sup>	diseases of low frequency	year to date <sup>1</sup>	5 year avg. <sup>3</sup>
Campylobacteriosis	63	69	53.8	Brucellosis	0	0
Cryptosporidiosis	6	8	3	HUS	0	0.2
<i>E. coli</i> O157:H7	1	3	2.8	Legionellosis	0	1.6
Ehrlichiosis	3	3	0.8	Listeriosis	0	0.8
Giardiasis	32	29	18.2	Lyme disease	0	0
<i>H. flu</i> (all types)	23	19	16	Malaria	2	1.2
Hep A	3	11	35.8	Psittacosis	0	0
Hep B	0	0	33.8	Typhoid fever	0	0
Hep C	0	0	1	Vibriosis	0	0
Meningococcal Inf	5	3	8.4	Yersinia	0	1
Rabies, animal	26	28	25.8			
RMSF	2	7	3.6	no. of animal rabies cases by animal type	year to date <sup>1</sup>	percent
Salmonellosis	55	55	58.4	cow	1	3.8%
Shigellosis	185	103	81.4	dog	3	11.5%
<i>S. invasive</i> group A	47	23	18.8	skunk	21	80.8%
<i>S. pneumoniae</i> , invasive	238	225	158.8	horse	1	3.8%
Tularemia	1	2	0.8	total	26	100%

1. 01.01.05 through 03.31.05
2. 01.01.04 through 03.31.04
3. aggregate data for first quarter of years 2000 through 2004

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