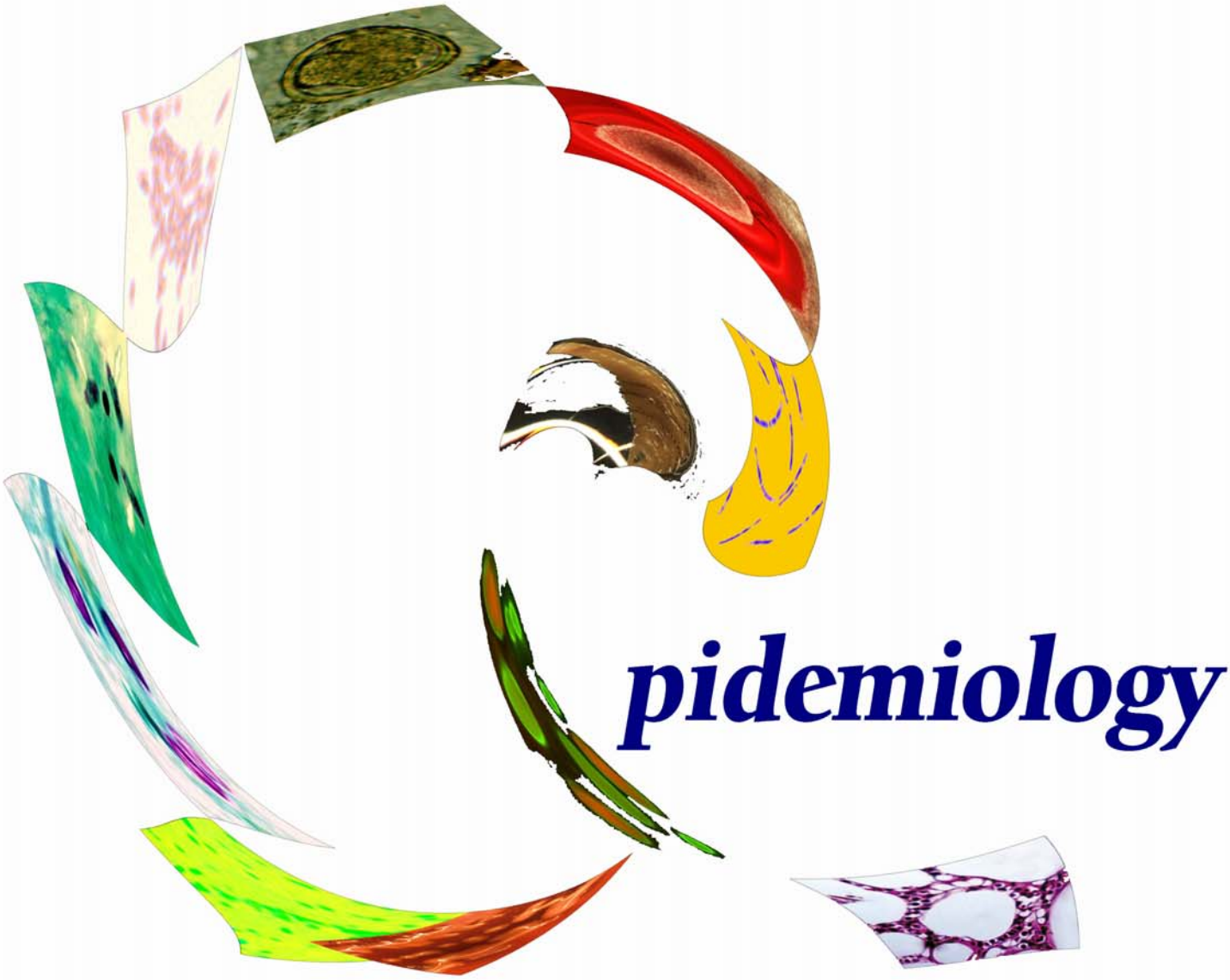
2002 Annual Summary of Infectious Diseases



Oklahoma State Department of Health

List of Contributors

Communicable Disease Division

Lauri Smithee
Darrell Eberly
Anthony Lee
Mikie Grubbs
John Bos
Kim Rayno
Laurence Burnsed
Kristy Bradley
Rebecca Coffman

HIV / STD Service

Mark Turner
Debra Frederickson
Jan Fox

Immunization Service

Susan Mendus
Lisa Ning

Public Health Laboratory

John Mathewson
Steve Johnson

Tuberculosis Division

Jon Tillinghast
Theresa Crisp

The Oklahoma Disease Reporting Manual, is issued by the Oklahoma State Department of Health, as authorized by Leslie M. Beitsch, M.D., J.D., Commissioner of Health and State Health Officer, Oklahoma State Department of Health. 300 Copies were printed by the Oklahoma State Department of Health and the University of Oklahoma in November 2003 at a cost of $2,552.

Intro to infectious disease surveillance

March 21, 2003

Dear Colleague:

We are pleased to send you a copy of the Oklahoma Disease Reporting Summary for 2002. The information contained in this summary consolidates surveillance and reports of disease in Oklahoma for 2002. Specifically it contains: 1) information on infectious disease reports at the state and county level, 2) disease specific data by category, and 3) additional information on special surveillance projects and outbreak reports in Oklahoma.

This annual summary was developed for use by health care professionals in Oklahoma. It is my hope that the data in this summary will be helpful to you in your practice. It is part of our continuing efforts to return useful information to you from the data you have reported to us. Use of this summary should give you a better idea of the incidence of reportable infectious diseases in your community, how your county compares to the state, and how Oklahoma compares to the nation.

Sincerely,

Mike Crutcher, M.D., M.P.H.
State Epidemiologist and Deputy
Commissioner for Disease and
Prevention Services

Table Of Contents

Infectious Disease Surveillance

- Quick Reference List of Reportable Infectious Diseases by Division
- Number of Cases of Communicable Diseases 1980—2002
- Notable Reportable Diseases by County, 2002

Disease Specific Data by Category

- Childhood Vaccine Preventable Diseases
- Enteric / Diarrheal Diseases
- General Communicable Diseases
- Hepatitis
- Meningitis / Septicemia
- Sexually Transmitted Infections
- Vectorborne Diseases

Special Surveillance Projects and Outbreak Reports

- Shigellosis Outbreak Associated with a Long-Term Care Facility for the Mentally Retarded, Oklahoma, 2002
- Outbreak of Hepatitis B virus and Hepatitis C virus infections in out-patient settings
- Influenza and Upper Respiratory Virus Surveillance, Oklahoma - October 2002 - April 2003
- Oklahoma Tickborne Disease Surveillance Project
- *Vibro vulnificus* in Oklahoma, 2002
- Outbreak of Acute Gastroenteritis of Unknown Etiology Associated with a Local Restaurant in Chickasha, Oklahoma, October 2002
- Table of 2002 Outbreaks and Unusual Illnesses, Oklahoma

Appendix

- Contact Information (State and County Offices)
- State of Oklahoma Reference Map

Quick Reference List of Reportable Infectious Diseases by Division

Communicable Disease Division

Anthrax
Arboviral Infections
Botulism
Brucellosis
Campylobacteriosis
Cryptosporidiosis
Cyclosporiasis
Dengue Fever
Enterohemorrhagic *E. coli*
Ehrlichiosis
Encephalitis
Giardiasis
H. influenzae Invasive Disease
Hantavirus pulmonary syndrome
Hemolytic Uremic syndrome, Post-diarrheal
Hepatitis A, Acute
Legionellosis
Leprosy (Hansen's Disease)
Leptospriosis
Listeriosis
Lyme Disease
Malaria
Meningococcal Invasive Disease
Plague
Psittacosis
Rabies
Rocky Mountain Spotted Fever
Salmonellosis
Shigellosis
Streptococcus Disease, Invasive, Group A
Streptococcus pneumoniae, Invasive Disease
Trichinosis
Tularemia
Typhoid Fever
Vibro spp. infections including cholera
Viral Hemorrhagic Fever

Quick Reference List of Reportable Infectious Diseases by Division

HIV/STD Service

CD4 count <500
Chlamydia trachomatis, Genital Infections
Gonorrhea
Hepatitis B and C, Acute
Human Immunodeficiency Virus (HIV) Infection and Acquired Immunodeficiency Syndrome (AIDS)
Syphilis

Immunization Division

Diphtheria
Measles (Rubeola)
Mumps
Pertussis
Poliomyelitis
Rubella (German Measles)
Rubella Syndrome, Congenital
Smallpox
Tetanus
Yellow Fever

Tuberculosis Division

Acid Fast Bacillus (AFB) positive smear
Tuberculosis

Organisms to be sent to the Public Health Laboratory

Bacillus anthracis
Brucella spp.
Campylobacter spp.
E. coli O157, O157:H7, or other enterohemorragic *E. coli* (EHEC)
Francisella tularensis
H. influenzae (sterile sites only)
Listeria (sterile sites only)
Mycobacterium tuberculosis
N. meningitidis (sterile sites only)
Plasmodium spp.
Salmonella spp.
Shigella spp.
Vibrio spp.
Yersinia spp.

Contact Information

Communicable Disease Division

1000 NE 10th St. — 0305
Oklahoma City, Oklahoma 73117-1299
Ph. - (405) 271-4060—Epidemiologist on call 24 hours per day
FAX* - (405) 271-6680
FAX* - (800) 898-6734

HIV / STD Service

1000 NE 10th St.
Mail Drop 0308
Oklahoma City, Oklahoma 73117-1299
Ph. - (405) 271-4636
FAX* - (405) 271-5149

Immunization Service

1000 NE 10th St.
Oklahoma City, Oklahoma 73117-1299
Ph. - (405) 271-4073
FAX* - (405) 271-6133

Public Health Laboratory

1000 NE 10th St.
Oklahoma City, Oklahoma 73117-1299
Ph. - (405) 271-5070
FAX* - (405) 271-4850

Tuberculosis Division

1000 NE 10th St.
Oklahoma City, Oklahoma 73117-1299
Ph. - (405) 271-6680
FAX* - (800) 898-6734

Mailing Isolates and Samples for Testing

Public Health Laboratory
P.O. Box 24106
OKC, OK 73124-0106

For instructions on sending isolates or clinical specimens to the OSDH PHL, see PHL Section or call PHL personnel between 8A.M. - 4:30P.M., M-F

*** All FAX machines are located in locked offices and are monitored to ensure the confidentiality of disease reports.**

Number of Cases of Communicable Diseases Oklahoma, 1980 - 2002

Reported Communicable Diseases, Oklahoma, 1980-2001																							
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Anthrax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AIDS	~	~	0	* 4	7	23	55	123	156	170	176	225	249	424	269	269	272	301	247	135	323	227	228
Botulism	0	0	0	0	# 2	1	# 1	0	0	0	0	# 1	# 1	0	# 2	0	0	0	0	# 1	0	# 1	#1
Brucellosis	10	8	8	6	7	4	0	6	2	4	1	2	0	1	0	1	1	0	0	0	1	0	1
Campylobacteriosis	15	56	116	* 212	216	305	288	254	212	234	248	204	268	204	187	289	281	247	240	321	360	307	362
Chlamydia	~	~	~	~	~	~	278	566	* 2714	2822	4172	5714	5220	4886	3784	5050	7371	7566	9378	8737	9346	10622	10732
Cholera	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Cryptosporidiosis	0	0	0	0	17	27	11	14	11	7	6	6	1	1	1	12	10	12	7	14	30	16	16
***E. coli* O157:H7**	~	~	~	~	~	~	~	~	~	6	4	0	5	9	* 16	16	14	13	26	41	19	36	25
Ehrlichiosis	0	0	0	0	0	0	0	23	14	1	1	3	8	0	0	0	0	0	2	11	12	24	13
Encephalitis	19	29	51	37	21	30	25	28	12	18	9	8	7	8	0	0	0	0	2	0	0	1	0
GAS Invasive	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	8	3	12	13	28	49	56
Gonorrhea	13844	15909	16021	15230	13088	13005	12572	9657	7411	6846	6464	6546	6432	4855	4935	5652	4897	4840	4225	4291	5236	4818	4624
***H. influenzae*, Inv. Dis.**	101	97	120	* 179	240	302	290	245	236	152	110	41	20	45	44	33	31	33	35	47	46	48	53
Hepatitis A	400	345	819	833	547	492	390	339	586	519	571	228	189	209	411	1498	2515	1441	667	533	272	116	52
Hepatitis B	233	255	359	353	296	269	276	255	219	221	183	454	499	192	129	801	57	66	169	185	182	115	108
Hepatitis Non A-Non B	0	0	0	53	61	78	76	55	48	35	31	46	49	49	55	54	0	0	1	5	2	0	0
Hepatitis C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	503	8	10	22	13	13	6	21
Hepatitis Unspecified	237	167	332	211	117	91	66	40	36	39	28	13	5	7	3	2	0	0	0	0	0	0	0
HIV Infection	~	~	~	~	~	~	~	~	* 178	262	616	545	518	293	212	229	200	222	238	183	261	193	213
Legionnaires Disease	0	7	13	* 12	19	24	24	32	19	27	15	24	14	11	7	8	3	3	16	7	5	7	5
Leptospirosis	1	0	0	4	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1
Listeriosis	5	1	3	0	1	12	20	17	10	20	14	8	9	12	11	11	5	9	19	12	8	2	9
Lyme Disease	0	0	0	0	0	0	0	0	9	17	13	* 33	24	19	110	50	36	45	7	8	1	0	0
Malaria	13	8	8	9	13	8	12	5	11	8	10	8	5	5	9	1	3	8	4	2	10	5	11
Measles (Rubeola)	776	6	30	1	9	1	41	4	8	112	172	0	12	0	0	0	0	1	0	0	0	0	0
Meningococcal Inf. (*N. meningitidis*)	31	47	33	39	30	41	39	39	27	31	20	14	22	36	52	49	46	45	44	40	34	32	25
Pertussis	30	3	9	349	248	208	149	173	72	72	70	49	47	99	21	44	21	61	34	43	6	43	135
Plague	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Rabies (Animal)	246	219	191	108	104	111	62	35	38	102	132	173	219	65	40	32	38	113	107	94	58	60	126
Rocky Mountain Spotted Fever	77	100	88	217	115	93	106	84	94	66	68	77	93	49	37	47	45	29	41	29	36	69	99
Rubella	8	4	3	1	0	2	0	6	1	1	1	2	1	1	4	0	0	0	0	1	0	0	0
Salmonellosis	390	440	501	613	447	477	512	477	497	462	441	481	369	325	465	471	520	392	501	467	405	503	524
Shigellosis	255	480	430	241	219	302	255	167	234	252	510	193	253	490	225	267	305	293	712	560	131	148	717
S. pneumo Invasive	47	15	20	23	20	27	503	35	39	63	124	100	90	126	164	131	101	80	73	110	118	415	500
Syphilis (Total Early)	377	452	542	482	458	482	428	477	415	375	589	596	709	636	399	489	398	275	264	347	245	185	183
Tetanus	1	2	1	0	2	1	1	1	1	2	0	0	1	1	1	0	1	2	1	0	0	1	0
Toxic Shock Syndrome	17	11	10	* 13	22	18	44	21	11	17	10	2	3	2	2	0	2	0	4	2	1	1	0
Tuberculosis	333	381	335	331	262	284	267	250	277	218	243	206	216	209	261	237	201	211	198	208	154	194	190
Tularemia	24	44	36	35	23	20	15	26	17	11	10	8	13	16	3	8	3	6	5	7	11	7	10
Typhoid Fever	8	5	3	3	4	2	3	6	0	1	3	3	0	1	3	1	0	3	1	0	1	1	2

*** First year disease was reportable by law** **# Infant botulism** **~ Data not available**

Reportable Diseases by County, 2002

	AIDS		Campylobacteriosis		Chlamydia	
County	2002 Cases	2002 Rate	2002 Cases	2002 Rate	2002 Cases	2002 Rate
Adair	**	**	5	23.8	68	323.2
Alfalfa	**	**	0	0	10	163.8
Atoka	**	**	0	0	17	122.5
Beaver	**	**	0	0	9	153.7
Beckham	**	**	2	10.1	36	181.8
Blaine	**	**	2	16.7	10	83.5
Bryan	0	0	1	2.7	83	227.2
Caddo	0	0	4	13.3	98	325
Canadian	9	10.3	5	5.7	142	161.9
Carter	0	0	7	15.3	126	276.2
Cherokee	**	**	7	16.5	134	315.1
Choctaw	0	0	0	0	41	267.2
Cimarron	**	**	1	31.8	3	95.3
Cleveland	4	1.9	4	1.9	370	177.9
Coal	**	**	2	33.2	14	232.1
Comanche	3	2.6	9	7.8	618	537.4
Cotton	**	**	1	15.1	10	151.2
Craig	0	0	0	0	33	220.7
Creek	**	**	4	5.9	174	258.3
Custer	0	0	0	0	47	179.8
Delaware	**	**	1	2.7	34	91.7
Dewey	0	0	0	0	0	0
Ellis	**	**	3	73.6	1	24.5
Garfield	**	**	4	6.9	124	214.5
Garvin	0	0	4	14.7	53	194.8
Grady	0	0	9	19.8	99	217.5
Grant	**	**	0	0	2	38.9
Greer	0	0	1	16.5	13	214.5
Harmon	**	**	0	0	7	213.2
Harper	**	**	0	0	2	56.1
Haskell	**	**	1	8.5	20	169.6
Hughes	**	**	1	7.1	33	233.1
Jackson	0	0	0	0	117	411.4
Jefferson	0	0	2	29.3	10	146.7
Johnston	0	0	1	9.5	21	199.8
Kay	**	**	9	18.7	115	239.2
Kingfisher	**	**	0	0	13	93.4
Kiowa	**	**	0	0	10	97.8

**** = Confidentiality concerns restricts releasing data for counties with 2 or fewer reported cases**

Reportable Diseases by County, 2002

	AIDS		Campylobacteriosis		Chlamydia	
County	2002 Cases	2002 Rate	2002 Cases	2002 Rate	2002 Cases	2002 Rate
Latimer	**	**	0	0	16	149.6
LeFlore	**	**	6	12.5	97	201.6
Lincoln	**	**	4	12.5	59	183.9
Logan	**	**	1	2.9	121	356.7
Love	**	**	0	0	18	203.8
Major	**	**	2	26.5	6	79.5
Marshall	**	**	1	7.6	18	136.5
Mayes	**	**	4	10.4	61	159
McClain	**	**	1	3.6	38	137
McCurtain	**	**	7	20.3	103	299.4
McIntosh	**	**	1	5.1	44	226.2
Murray	**	**	0	0	31	245.6
Muskogee	6	8.6	8	11.5	334	480.9
Noble	0	0	4	35.1	19	166.5
Nowata	**	**	0	0	20	189.2
Okfuskee	0	0	3	25.4	25	211.6
Oklahoma	94	14.2	122	18.5	3288	497.8
Okmulgee	**	**	2	5	160	403.2
Osage	**	**	0	0	69	155.3
Ottawa	3	9	4	12.1	77	232
Pawnee	0	0	0	0	33	198.7
Payne	3	4.4	7	10.3	199	291.8
Pittsburg	**	**	2	4.6	98	223
Pontotoc	0	0	8	22.8	87	247.6
Pottawat.	**	**	3	4.6	151	230.5
Pushmat.	**	**	0	0	17	145.7
Roger Mills	**	**	0	0	1	29.1
Rogers	6	8.5	5	7.1	89	126
Seminole	**	**	3	12.1	90	361.5
Sequoyah	**	**	5	12.8	72	184.7
Stephens	**	**	7	16.2	81	187.6
Texas	0	0	5	24.9	26	129.3
Tillman	**	**	4	43.1	24	258.4
Tulsa	59	10.5	45	8	2162	383.8
Wagoner	0	0	5	8.7	95	165.2
Washing.	3	6.1	2	4.1	97	198
Washita	**	**	0	0	10	86.9
Woods	**	**	0	0	26	286.1
Woodward	0	0	1	5.4	41	221.8
Unknown/ Other	9					
State Total	**228**	**6.6**	**362**	**10.5**	**10720**	**310.7**

**** = Confidentiality concerns restricts releasing data for counties with 2 or fewer reported cases.**

Reportable Diseases by County, 2002

	Cryptosporidiosis		E. coli O157:H7 Infections		Giardia	
County	2002 Cases	2002 Rate	2002 Cases	2002 Rate	2002 Cases	2002 Rate
Adair	1	4.8	0	0	0	0
Alfalfa	0	0	0	0	1	16.4
Atoka	0	0	0	0	0	0
Beaver	0	0	0	0	0	0
Beckham	0	0	0	0	0	0
Blaine	0	0	0	0	0	0
Bryan	0	0	0	0	0	0
Caddo	0	0	0	0	0	0
Canadian	0	0	0	0	5	5.7
Carter	4	8.8	0	0	1	2.2
Cherokee	1	2.4	0	0	0	0
Choctaw	0	0	0	0	0	0
Cimarron	0	0	0	0	0	0
Cleveland	2	1	2	1	5	2.4
Coal	0	0	1	16.6	0	0
Comanche	0	0	1	0.9	0	0
Cotton	0	0	0	0	0	0
Craig	0	0	0	0	1	6.7
Creek	0	0	1	1.5	4	5.9
Custer	0	0	0	0	1	3.8
Delaware	0	0	1	2.7	1	2.7
Dewey	0	0	0	0	0	0
Ellis	0	0	0	0	0	0
Garfield	0	0	0	0	4	6.9
Garvin	0	0	0	0	1	3.7
Grady	0	0	0	0	0	0
Grant	0	0	0	0	0	0
Greer	0	0	0	0	0	0
Harmon	0	0	0	0	0	0
Harper	0	0	0	0	0	0
Haskell	0	0	0	0	3	25.4
Hughes	0	0	0	0	0	0
Jackson	1	3.5	0	0	0	0
Jefferson	0	0	0	0	0	0
Johnston	0	0	0	0	0	0
Kay	0	0	1	2.1	1	2.1
Kingfisher	0	0	0	0	0	0
Kiowa	0	0	0	0	0	0

Reportable Diseases by County, 2002

	Cryptosporidiosis		E. coli O157:H7 Infections		Giardia	
County	**2002 Cases**	**2002 Rate**	**2002 Cases**	**2002 Rate**	**2002 Cases**	**2002Rate**
Latimer	0	0	0	0	0	0
LeFlore	0	0	0	0	0	0
Lincoln	0	0	1	3.1	1	3.1
Logan	0	0	0	0	2	5.9
Love	0	0	0	0	2	22.6
Major	0	0	0	0	0	0
Marshall	0	0	0	0	0	0
Mayes	1	2.6	0	0	0	0
McClain	0	0	0	0	0	0
McCurtain	0	0	0	0	0	0
McIntosh	0	0	1	5.1	0	0
Murray	0	0	0	0	1	7.9
Muskogee	0	0	0	0	1	1.4
Noble	0	0	0	0	1	8.8
Nowata	0	0	0	0	0	0
Okfuskee	0	0	0	0	0	0
Oklahoma	2	0.3	6	0.9	21	3.2
Okmulgee	0	0	0	0	0	0
Osage	0	0	0	0	1	2.3
Ottawa	0	0	0	0	2	6
Pawnee	0	0	0	0	0	0
Payne	0	0	1	1.5	2	2.9
Pittsburg	0	0	0	0	0	0
Pontotoc	1	2.8	0	0	2	5.7
Pottawat.	0	0	3	4.6	0	0
Pushmat.	0	0	0	0	0	0
Roger Mills	0	0	0	0	0	0
Rogers	0	0	0	0	1	1.4
Seminole	0	0	0	0	0	0
Sequoyah	0	0	0	0	0	0
Stephens	0	0	0	0	0	0
Texas	0	0	0	0	0	0
Tillman	0	0	0	0	0	0
Tulsa	3	0.5	6	1.1	17	3
Wagoner	0	0	0	0	0	0
Washing.	0	0	0	0	3	6.1
Washita	0	0	0	0	0	0
Woods	0	0	0	0	0	0
Woodward	0	0	0	0	0	0
State Total	**16**	**0.5**	**25**	**0.7**	**85**	**2.5**

Reportable Diseases by County, 2002

	Hepatitis A		Hepatitis B		Hepatitis C	
County	2002 Cases	2002 Rate	2002 Cases	2002 Rate	2002 Cases	2002 Rate
Adair	0	0	0	0	0	0
Alfalfa	0	0	0	0	0	0
Atoka	0	0	5	36	0	0
Beaver	0	0	0	0	0	0
Beckham	0	0	0	0	0	0
Blaine	0	0	0	0	0	0
Bryan	1	2.7	1	2.7	1	2.7
Caddo	1	3.3	3	10	0	0
Canadian	1	1.1	0	0	0	0
Carter	0	0	0	0	0	0
Cherokee	0	0	0	0	0	0
Choctaw	0	0	2	13	0	0
Cimarron	2	63.5	0	0	0	0
Cleveland	3	1.4	8	3.8	9	4.3
Coal	0	0	1	16.6	0	0
Comanche	2	1.7	2	1.7	0	0
Cotton	0	0	0	0	0	0
Craig	0	0	0	0	0	0
Creek	1	1.5	0	0	0	0
Custer	0	0	1	3.8	0	0
Delaware	0	0	1	2.7	0	0
Dewey	0	0	0	0	0	0
Ellis	0	0	0	0	0	0
Garfield	1	1.7	5	8.6	0	0
Garvin	0	0	2	7.4	0	0
Grady	0	0	2	4.4	1	2.2
Grant	0	0	0	0	0	0
Greer	0	0	0	0	0	0
Harmon	0	0	0	0	0	0
Harper	0	0	0	0	0	0
Haskell	0	0	0	0	0	0
Hughes	0	0	0	0	0	0
Jackson	0	0	1	3.5	1	3.5
Jefferson	0	0	0	0	0	0
Johnston	0	0	0	0	0	0
Kay	0	0	1	2.1	0	0
Kingfisher	0	0	0	0	0	0
Kiowa	0	0	0	0	0	0

Reportable Diseases by County, 2002

	Hepatitis A		Hepatitis B		Hepatitis C	
County	2002 Cases	2002 Rate	2002 Cases	2002 Rate	2002 Cases	2002 Rate
Latimer	1	9.4	1	9.4	0	0
LeFlore	0	0	2	4.2	0	0
Lincoln	0	0	0	0	0	0
Logan	0	0	1	2.9	0	0
Love	0	0	0	0	0	0
Major	0	0	0	0	0	0
Marshall	0	0	0	0	0	0
Mayes	0	0	1	2.6	0	0
McClain	0	0	2	7.2	1	3.6
McCurtain	1	2.9	0	0	0	0
McIntosh	0	0	0	0	0	0
Murray	0	0	3	23.8	0	0
Muskogee	0	0	7	10.1	0	0
Noble	0	0	0	0	0	0
Nowata	0	0	0	0	0	0
Okfuskee	0	0	1	8.5	0	0
Oklahoma	7	1.1	26	3.9	1	0.2
Okmulgee	0	0	1	2.5	0	0
Osage	0	0	0	0	0	0
Ottawa	0	0	0	0	0	0
Pawnee	0	0	0	0	0	0
Payne	3	4.4	1	1.5	0	0
Pittsburg	1	2.3	3	6.8	0	0
Pontotoc	0	0	1	2.8	2	5.7
Pottawat.	0	0	0	0	0	0
Pushmat.	1	8.6	0	0	0	0
Roger Mills	0	0	0	0	0	0
Rogers	0	0	1	1.4	0	0
Seminole	0	0	1	4	0	0
Sequoyah	3	7.7	1	2.6	0	0
Stephens	0	0	2	4.6	0	0
Texas	3	14.9	0	0	0	0
Tillman	0	0	0	0	0	0
Tulsa	15	2.7	16	2.8	5	0.9
Wagoner	0	0	0	0	0	0
Washing.	0	0	0	0	0	0
Washita	0	0	1	8.7	0	0
Woods	0	0	0	0	0	0
Woodward	0	0	1	5.4	0	0
State Total	**52**	**1.5**	**108**	**3.1**	**21**	**0.6**

Reportable Diseases by County, 2002

	HIV		Gonorrhea		Meningococcal Invasive Disease	
County	2002 Cases	2002 Rate	2002 Cases	2002 Rate	2002 Cases	2002 Rate
Adair	0	0	7	33.3	0	0
Alfalfa	**	**	1	16.4	0	0
Atoka	**	**	8	57.6	0	0
Beaver	**	**	0	0	0	0
Beckham	**	**	11	55.6	0	0
Blaine	0	0	1	8.4	0	0
Bryan	0	0	20	54.7	0	0
Caddo	0	0	24	79.6	0	0
Canadian	0	0	22	25.1	0	0
Carter	0	0	76	166.6	1	2.2
Cherokee	0	0	38	89.4	0	0
Choctaw	0	0	28	182.5	0	0
Cimarron	**	**	0	0	0	0
Cleveland	4	1.9	90	43.3	2	1
Coal	**	**	0	0	0	0
Comanche	8	7	325	282.6	0	0
Cotton	0	0	1	15.1	0	0
Craig	0	0	5	33.4	0	0
Creek	**	**	40	59.4	0	0
Custer	0	0	11	42.1	0	0
Delaware	0	0	2	5.4	0	0
Dewey	**	**	0	0	0	0
Ellis	**	**	0	0	0	0
Garfield	**	**	25	43.2	1	1.7
Garvin	0	0	13	47.8	1	3.7
Grady	0	0	20	43.9	0	0
Grant	0	0	1	19.4	0	0
Greer	**	**	1	16.5	0	0
Harmon	**	**	2	60.9	0	0
Harper	**	**	1	28.1	0	0
Haskell	0	0	1	8.5	0	0
Hughes	**	**	7	49.5	0	0
Jackson	0	0	49	172.3	1	3.5
Jefferson	0	0	1	14.7	0	0
Johnston	**	**	4	38	0	0
Kay	0	0	28	56.2	0	0
Kingfisher	0	0	1	7.2	0	0
Kiowa	0	0	8	78.2	0	0

** = Confidentiality concerns restricts releasing data for counties with 2 or fewer reported cases

Reportable Diseases by County, 2002

	HIV		Gonorrhea		Meningococcal Invasive Disease	
County	**2002 Cases**	**2002 Rate**	**2002 Cases**	**2002 Rate**	**2002 Cases**	**2002 Rate**
Latimer	0	0	6	53.1	0	0
LeFlore	**	**	20	41.6	0	0
Lincoln	0	0	14	43.6	1	3.1
Logan	**	**	40	117.9	0	0
Love	0	0	2	22.6	0	0
Major	**	**	1	13.3	0	0
Marshall	**	**	4	30.3	0	0
Mayes	0	0	7	18.2	1	2.6
McClain	3	10.8	5	18	0	0
McCurtain	0	0	43	125	0	0
McIntosh	0	0	12	61.7	0	0
Murray	0	0	7	55.5	0	0
Muskogee	**	**	139	200.1	1	1.4
Noble	**	**	1	8.8	1	8.8
Nowata	0	0	3	28.4	0	0
Okfuskee	0	0	3	25.4	0	0
Oklahoma	89	13.5	1872	283.4	4	0.6
Okmulgee	**	**	49	123.5	0	0
Osage	0	0	4	9	0	0
Ottawa	**	**	15	45.2	0	0
Pawnee	0	0	6	36.1	1	6
Payne	3	4.4	35	51.3	0	0
Pittsburg	**	**	31	70.5	0	0
Pontotoc	**	**	24	68.3	0	0
Pottawat.	**	**	33	50.4	1	1.5
Pushmat.	0	0	2	17.1	0	0
Roger Mills	**	**	0	0	0	0
Rogers	4	5.7	15	21.2	1	1.4
Seminole	**	**	40	160.7	0	0
Sequoyah	**	**	28	71.8	0	0
Stephens	**	**	11	25.5	1	2.3
Texas	0	0	5	24.9	0	0
Tillman	0	0	4	43.1	0	0
Tulsa	60	10.7	1206	214.1	6	1.1
Wagoner	3	5.2	36	62.6	0	0
Washing.	**	**	23	46.9	0	0
Washita	0	0	0	0	0	0
Woods	0	0	2	22	0	0
Woodward	0	0	4	21.6	0	0
Unknown/ Other	9	0	**1**	**0**		
State Total	**213**	**6.2**	**4624**	**134**	**25**	**0.7**

**** = Confidentiality concerns restricts releasing data for counties with 2 or fewer reported cases.**

Reportable Diseases by County, 2002

	Animal Rabies	Rocky Mountain Spotted Fever	
County	2002 Cases	2002 Cases	2002 Rate
Adair	1	2	9.5
Alfalfa	0	0	0
Atoka	2	0	0
Beaver	0	0	0
Beckham	0	0	0
Blaine	1	0	0
Bryan	1	0	0
Caddo	0	0	0
Canadian	3	2	2.3
Carter	2	1	2.2
Cherokee	0	7	16.5
Choctaw	4	2	13.0
Cimarron	0	0	0
Cleveland	3	9	4.3
Coal	0	0	0
Comanche	0	0	0
Cotton	0	0	0
Craig	0	1	6.7
Creek	0	3	4.5
Custer	0	0	0
Delaware	0	3	8.1
Dewey	0	0	0
Ellis	0	0	0
Garfield	10	1	1.7
Garvin	0	1	3.7
Grady	1	0	0
Grant	3	0	0
Greer	1	0	0
Harmon	0	0	0
Harper	0	0	0
Haskell	1	0	0
Hughes	1	0	0
Jackson	3	0	0
Jefferson	0	0	0
Johnston	6	1	9.5
Kay	2	0	0
Kingfisher	4	0	0
Kiowa	0	0	0

Reportable Diseases by County, 2002

	Animal Rabies	Rocky Mountain Spotted Fever	
County	2002 Cases	2002 Cases	2002 Rate
Latimer	1	3	6.2
LeFlore	9	3	9.4
Lincoln	5	2	5.9
Logan	8	0	0
Love	2	0	0
Major	1	0	0
Marshall	0	0	0
Mayes	0	4	10.4
McClain	2	0	0
McCurtain	2	2	5.8
McIntosh	0	1	5.1
Murray	0	1	7.9
Muskogee	0	1	1.4
Noble	2	1	8.8
Nowata	0	1	9.5
Okfuskee	1	0	0
Oklahoma	9	12	1.8
Okmulgee	0	2	5
Osage	1	3	6.8
Ottawa	1	1	3
Pawnee	0	1	6
Payne	2	3	4.4
Pittsburg	3	6	13.7
Pontotoc	3	1	2.8
Pottawat.	8	3	4.6
Pushmat.	3	2	17.1
Roger Mills	1	0	0
Rogers	0	2	2.8
Seminole	9	1	4
Sequoyah	1	0	0
Stephens	0	1	2.3
Texas	0	0	0
Tillman	0	0	0
Tulsa	2	8	1.4
Wagoner	0	0	0
Washing.	0	0	0
Washita	0	1	8.7
Woods	1	0	0
Woodward	0	0	0
State Total	**126**	**99**	**2.9**

Reportable Diseases by County, 2002

	Salmonellosis		Shigellosis	
County	2002 Cases	2002 Rate	2002 Cases	2002 Rate
Adair	3	14.3	1	4.8
Alfalfa	1	16.4	0	0
Atoka	5	36	1	7.2
Beaver	0	0	0	0
Beckham	2	10.1	0	0
Blaine	2	16.7	3	25.1
Bryan	1	2.7	13	35.6
Caddo	11	36.5	15	49.8
Canadian	6	6.8	33	37.6
Carter	13	28.5	7	15.3
Cherokee	11	25.9	0	0
Choctaw	3	19.6	0	0
Cimarron	0	0	0	0
Cleveland	18	8.7	6	2.9
Coal	2	33.2	0	0
Comanche	16	13.9	11	9.6
Cotton	2	30.2	11	0
Craig	2	13.4	0	20.1
Creek	15	22.3	3	49
Custer	6	23.0	33	3.8
Delaware	3	8.1	1	0
Dewey	0	0	0	0
Ellis	0	0	0	0
Garfield	15	25.9	0	0
Garvin	7	25.7	2	3.5
Grady	2	4.4	1	3.7
Grant	1	19.4	3	6.6
Greer	0	0	0	0
Harmon	0	0	0	0
Harper	1	28.1	0	0
Haskell	3	25.4	0	0
Hughes	0	0	0	0
Jackson	9	31.6	1	3.5
Jefferson	2	29.3	0	0
Johnston	2	19	3	28.5
Kay	12	25	2	4.2
Kingfisher	1	7.2	0	0
Kiowa	1	9.8	0	0

Reportable Diseases by County, 2002

	Salmonellosis		Shigellosis	
County	2002 Cases	2002 Rate	2002 Cases	2002 Rate
Latimer	2	18.7	7	65.5
LeFlore	12	24.9	2	4.2
Lincoln	8	24.9	0	0
Logan	8	23.6	1	2.9
Love	12	135.9	0	0
Major	0	0	0	0
Marshall	0	0	2	15.2
Mayes	5	13	0	0
McClain	4	14.4	9	26.2
McCurtain	9	26.2	1	5.1
McIntosh	1	5.1	0	0
Murray	2	15.8	0	0
Muskogee	7	10.1	4	5.8
Noble	1	8.8	3	26.3
Nowata	0	0	0	0
Okfuskee	3	25.4	0	0
Oklahoma	91	13.8	189	28.6
Okmulgee	3	7.6	2	5
Osage	3	6.8	0	0
Ottawa	2	6	141	424.8
Pawnee	2	12	2	12
Payne	26	38.1	25	36.7
Pittsburg	4	9.1	4	9.1
Pontotoc	6	17.1	0	0
Pottawat.	13	19.8	10	15.3
Pushmat.	1	8.6	0	0
Roger Mills	1	29.1	0	0
Rogers	10	14.2	6	8.5
Seminole	1	4	0	0
Sequoyah	2	5.1	0	0
Stephens	10	23.2	1	2.3
Texas	1	5	3	14.9
Tillman	1	10.8	0	0
Tulsa	79	14	162	28.8
Wagoner	5	8.7	1	1.7
Washing.	4	8.2	1	2
Washita	4	34.8	0	0
Woods	1	11	0	0
Woodward	2	10.8	1	5.4
State Total	**524**	**15.2**	**717**	**20.8**

Reportable Diseases by County, 2002

	Primary & Secondary Syphilis		Total Early Syphilis		Tuberculosis	
County	2002 Cases	2002 Rate	2002 Cases	2002 Rate	2002 Cases	2002 Rate
Adair	0	0	0	0	1	4.8
Alfalfa	0	0	0	0	0	0
Atoka	0	0	0	0	0	0
Beaver	0	0	0	0	0	0
Beckham	0	0	0	0	0	0
Blaine	0	0	0	0	0	0
Bryan	0	0	0	0	5	5.5
Caddo	0	0	1	3.3	5	6.6
Canadian	0	0	2	2.3	0	0
Carter	0	0	0	0	2	4.4
Cherokee	0	0	0	0	0	0
Choctaw	0	0	0	0	1	6.5
Cimarron	0	0	0	0	0	0
Cleveland	0	0	1	0.5	9	4.3
Coal	0	0	0	0	2	33.2
Comanche	0	0	2	1.7	6	5.2
Cotton	0	0	0	0	0	0
Craig	0	0	0	0	1	6.7
Creek	0	0	0	0	2	3.0
Custer	0	0	0	0	0	0
Delaware	0	0	0	0	1	2.7
Dewey	0	0	0	0	0	0
Ellis	0	0	2	49.1	0	0
Garfield	0	0	6	10.4	8	13.8
Garvin	0	0	0	0	0	0
Grady	1	2.2	1	2.2	3	6.6
Grant	0	0	0	0	0	0
Greer	0	0	0	0	0	0
Harmon	0	0	0	0	0	0
Harper	0	0	0	0	0	0
Haskell	0	0	0	0	0	0
Hughes	0	0	0	0	2	14.1
Jackson	0	0	0	0	18	63.3
Jefferson	0	0	0	0	0	0
Johnston	0	0	0	0	0	0
Kay	0	0	0	0	0	0
Kingfisher	0	0	0	0	0	0
Kiowa	0	0	0	0	0	0

Reportable Diseases by County, 2002

	Primary & Secondary Syphilis		Total Early Syphilis		Tuberculosis	
County	2002 Cases	2002Rate	2002 Cases	2002 Rate	2002 Cases	2002 Rate
Latimer	0	0	0	0	0	0
LeFlore	0	0	1	2.1	0	0
Lincoln	0	0	1	3.1	0	0
Logan	1	2.9	2	5.9	0	0
Love	0	0	0	0	0	0
Major	0	0	0	0	0	0
Marshall	0	0	0	0	0	0
Mayes	0	0	0	0	1	2.6
McClain	0	0	0	0	0	0
McCurtain	0	0	0	0	11	32.0
McIntosh	0	0	0	0	3	15.4
Murray	0	0	0	0	1	7.9
Muskogee	0	0	5	7.2	1	1.4
Noble	0	0	0	0	0	0
Nowata	0	0	0	0	0	0
Okfuskee	0	0	0	0	0	0
Oklahoma	64	9.7	145	22	53	8.0
Okmulgee	0	0	1	2.5	1	2.5
Osage	0	0	1	2.3	0	0
Ottawa	0	0	0	0	3	9.0
Pawnee	0	0	0	0	0	0
Payne	0	0	2	2.9	3	4.4
Pittsburg	0	0	1	2.3	3	6.8
Pontotoc	0	0	0	0	1	2.8
Pottawat.	0	0	0	0	3	4.6
Pushmat.	0	0	0	0	2	17.1
Roger Mills	0	0	0	0	0	0
Rogers	0	0	1	1.4	7	9.9
Seminole	0	0	1	4	1	4.0
Sequoyah	0	0	0	0	2	5.1
Stephens	0	0	0	0	1	2.3
Texas	0	0	0	0	3	14.9
Tillman	0	0	0	0	2	21.5
Tulsa	7	1.2	27	4.8	25	4.4
Wagoner	0	0	1	1.7	1	1.7
Washing.	0	0	0	0	2	4.1
Washita	0	0	0	0	0	0
Woods	0	0	0	0	0	0
Woodward	0	0	1	5.4	0	0
State Total	**73**	**2.1**	**205**	**5.9**	**190**	**5.5**

Disease Specific Data by Category

Childhood Vaccine Preventable Diseases

Measles

2002 Case Total	**0**
U.S. Rate	.02 per 100,000

The occurrence of measles has remained at very low levels in Oklahoma since 1991. During the late 1980s and in 1990, Oklahoma saw a resurgence of measles when measles cases also increased nationwide. A second dose of measles vaccine became a requirement in 1990 for children entering kindergarten in Oklahoma. Since 1992, Oklahoma has reported 13 cases of measles. Twelve cases were reported in 1992 and one case was reported in 1997. The 1997 case was an imported case from Europe; there were no secondary cases identified in Oklahoma from this case.

In March of 2000, a group of consultants convened by the Centers for Disease Control and Prevention (CDC) concluded that measles is no longer endemic in the United States. Rather, all cases in the U.S. appear to be the result of importation from other countries with limited domestic spread. Most of these imported cases come from Europe and Asia. Due to an aggressive measles vaccination program by the Pan American Health Organization, measles incidence is now very low in Latin America and the Caribbean.

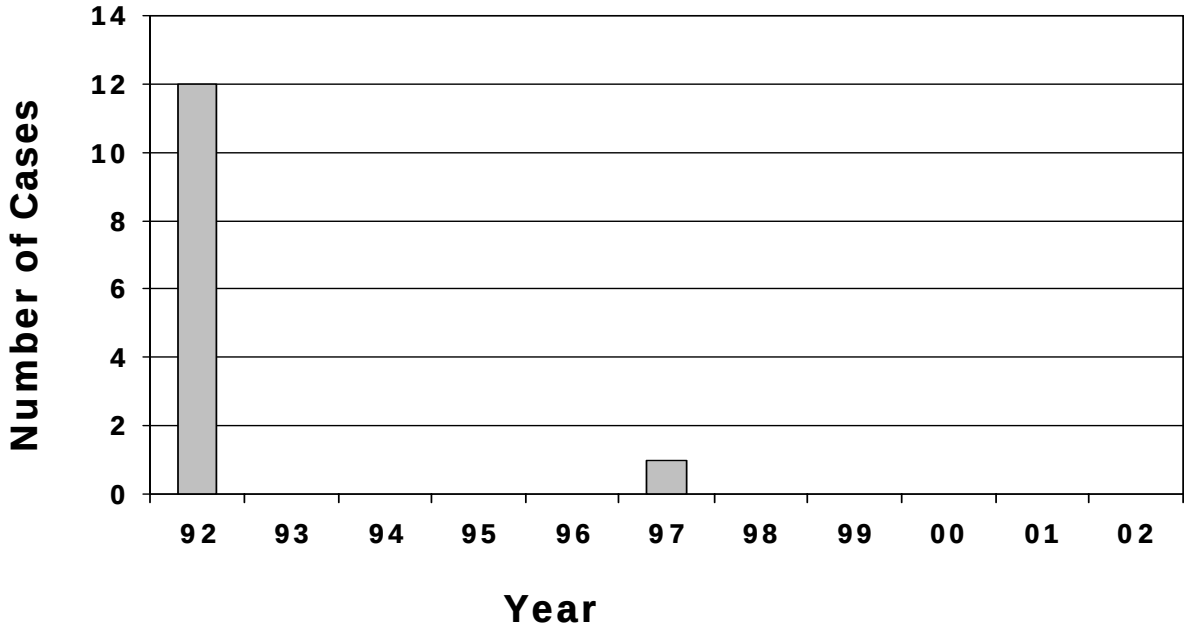
Mumps

2002 Case Total	**3**
Oklahoma Rate	.087 per 100,000

Mumps became a reportable disease in Oklahoma in 1987. Since that time, reported cases of mumps have steadily declined from a high of 250 cases in 1988 to zero cases in 2001. Three cases of mumps were reported in 2002. A similar decline has been observed in the United States in reported mumps cases, from 5,712 cases in 1989 to 270 cases in 2002. The decrease in cases is attributed to the recommended two doses of MMR for children throughout the United States, which is required for school attendance in Oklahoma and most other states.

Surveillance for mumps remains problematic as up to 20% of mumps infections are asymptomatic and an additional 40% to 50% may have only nonspecific or primarily respiratory symptoms. Diagnosis of mumps is confirmed by noting a four-fold rise in antibody titers to specific antigens in acute and convalescent sera drawn at least 4 weeks apart. Mumps testing may be obtained from the OSDH Public Health Laboratory.

Number of Reported Measles Cases by Year, Oklahoma, 1992-2002



Pertussis

2002 Case Total **135**
Oklahoma Rate 3.91 per 100,000

Oklahoma experienced a dramatic increase in the number of pertussis cases reported in 2002; 135 cases of pertussis were reported to the Oklahoma State Department of Health in 2002. The incidence rate in Oklahoma was 3.91 cases per 100,000 population. The rate of reported pertussis cases in 2002 was the highest incidence rate in the past 10 years. The number of cases reported in 2002 was 3 times higher than the average number of pertussis cases reported in Oklahoma from 1992 to 2001, which was 42 cases.

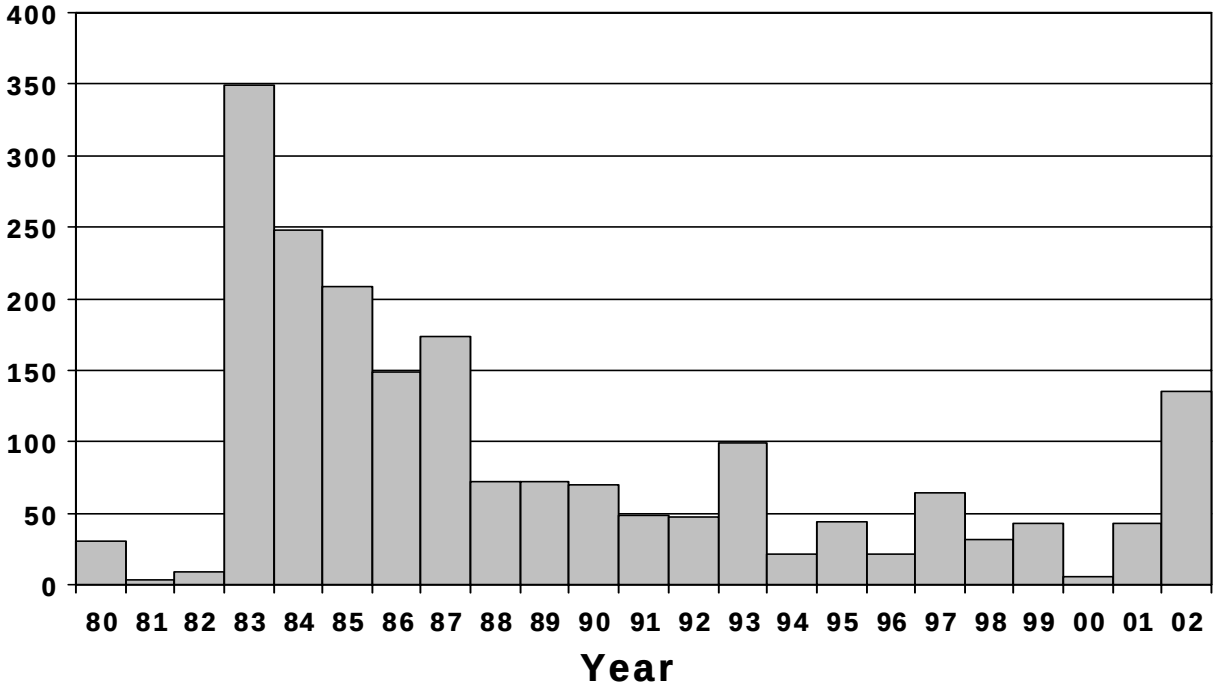
In 2002, cases range in age from 4 days to 82 years with a median age of ??. The age distribution of the 135 cases in 2002 indicate that pertussis is still a threat to infants too young to have received 3 doses of pertussis-containing vaccine. Adolescents and adults living in the same household are the most common source of infection for infants.

The most common symptom of the 135 cases was a paroxysmal cough, which was present in 123 (91%) of the cases. The average length of cough in the cases for which cough duration was known was 34 days. This average includes cases who were still coughing when last interviewed. The second most common symptom reported by cases was a whoop, which was reported by 67 (50%) cases. Vomiting following paroxysms was occurred in 25 (18%) of the 135 cases. Twenty-three (17%) of the cases were hospitalized. Eighteen (78%) of twenty-three hospitalized cases were under 1 year of age. One outbreak of pertussis was identified in 2002 in a family.

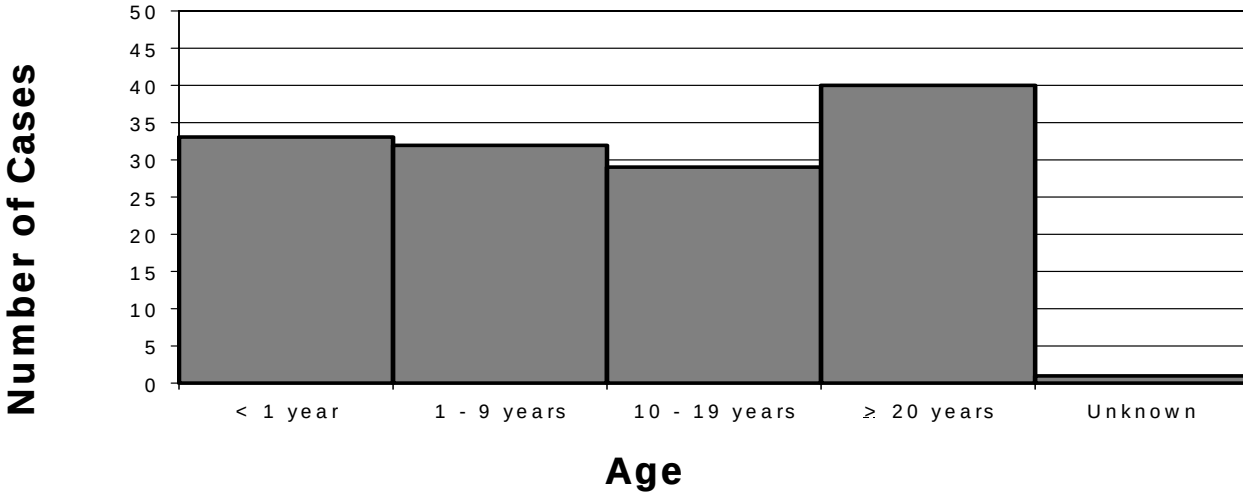
Cases have been reported from counties in every area of the state during the past 5 years, however, many counties had no cases reported. Cases were reported from the following counties every year for the past five years: Cleveland, Creek, Oklahoma, and Tulsa; and in the following counties for four out of the five past years: Cherokee and Kay. Cases were reported from 27 counties in 2002.

The standard and preferred test for diagnosis of pertussis is isolation of *B. Pertussis* by bacterial culture as offered by the OSDH Public Health Laboratory. However, lack of laboratory confirmation should not rule out pertussis since the organism can be difficult to isolate. Serologic testing is useful for clinical diagnosis, but is not yet standardized and is difficult to interpret. Prevention efforts should be directed at maintaining high vaccination rates among children and managing pertussis cases and outbreaks.

Number of Reported Pertussis Cases by Year, Oklahoma, 1980-2002



Number of Reported Pertussis Cases by Age, Oklahoma, 2002 (N=135)



Rubella

2002 Case Total 0
U.S. Rate .007 per 100,000

Rubella has been at very low levels in Oklahoma since 1980, with an average of 1.8 cases reported annually. The highest number of cases reported since 1980 in a single year is 8 reported in both 1980 and 1981. The last case of rubella reported in Oklahoma was in 1999 and was linked to the outbreak in Arkansas, which began among poultry processing workers in plants in Ft. Smith. The majority of cases associated with this outbreak in Arkansas (83%) were Hispanic adults and 75% were foreign born, which was similar to national rubella reporting. The United States is on the verge of eliminating indigenous rubella and Congenital Rubella Syndrome. Rubella outbreaks continue to occur primarily among Hispanics from countries where no national rubella vaccination program exists or where a program has been implemented only recently. Universal rubella vaccination was introduced in Mexico in 1998.

The primary strategies for rubella control in Oklahoma is as follows: universal immunization of children with two doses of MMR with the first dose between 12 and 15 months of age and the second dose before entering kindergarten (ages 4 to 6 years), prenatal screening for rubella immunity, postnatal vaccination of rubella-susceptible women, and outbreak control when a case is detected.

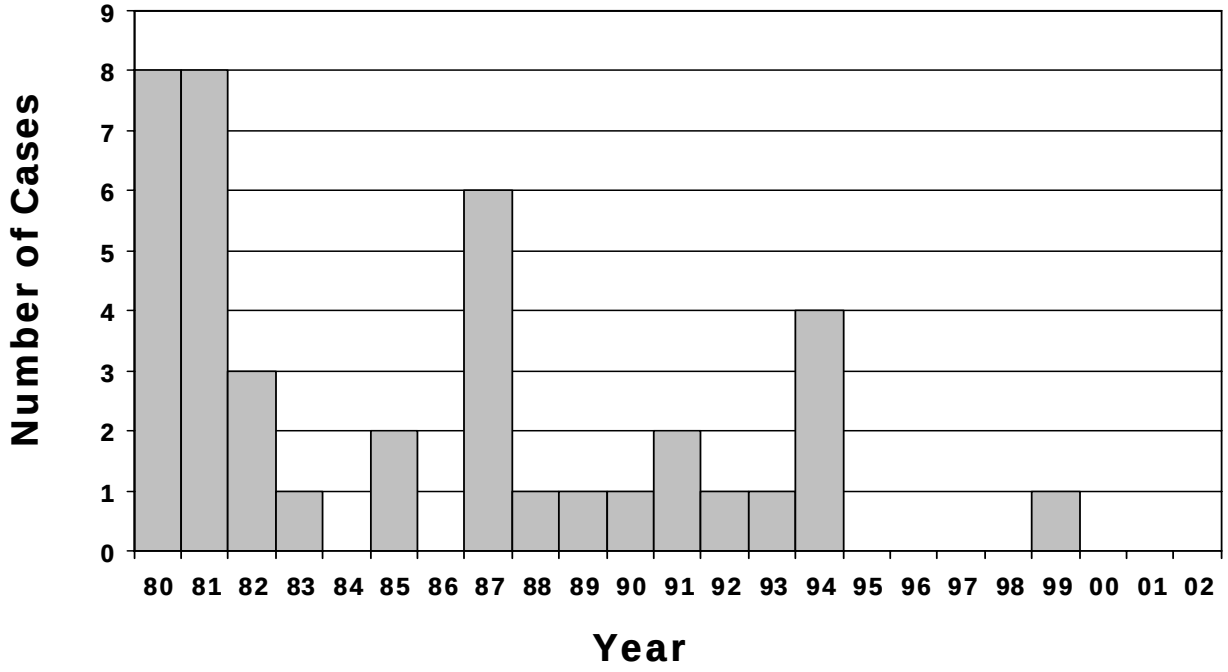
Tetanus

2002 Case Total 0
U.S. Rate .011 per 100,000

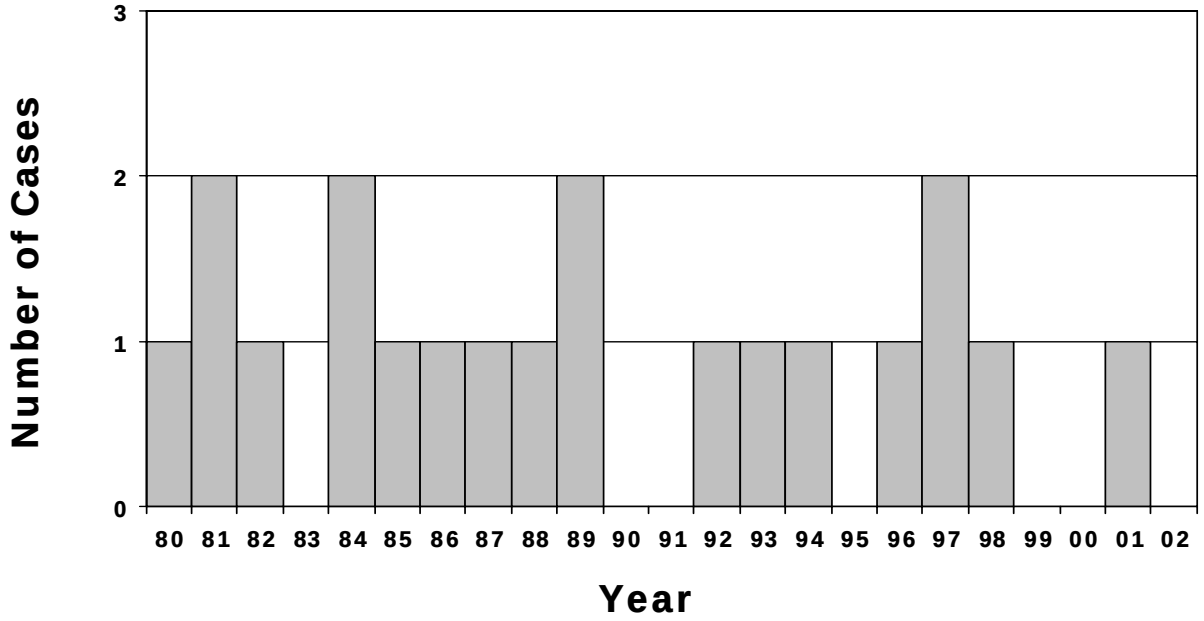
The average number of reported tetanus cases in Oklahoma during the past 20 years (1982 –2001) is 0.9 cases. No cases of tetanus were reported in Oklahoma in 2002. There are no laboratory findings characteristic of tetanus. The diagnosis is entirely clinical and does not depend upon bacteriologic confirmation. *Clostridium tetani* is recovered from the wound in only 30% of cases, and not infrequently, it is isolated from patients who do not have tetanus.

Prevention efforts should be directed at maintaining high vaccination rates among children and adults and managing tetanus cases and outbreaks.

Number of Reported Cases of Rubella by Year, Oklahoma, 1980-2002



Number of Reported Cases of Tetanus by Year, Oklahoma, 1980-2002



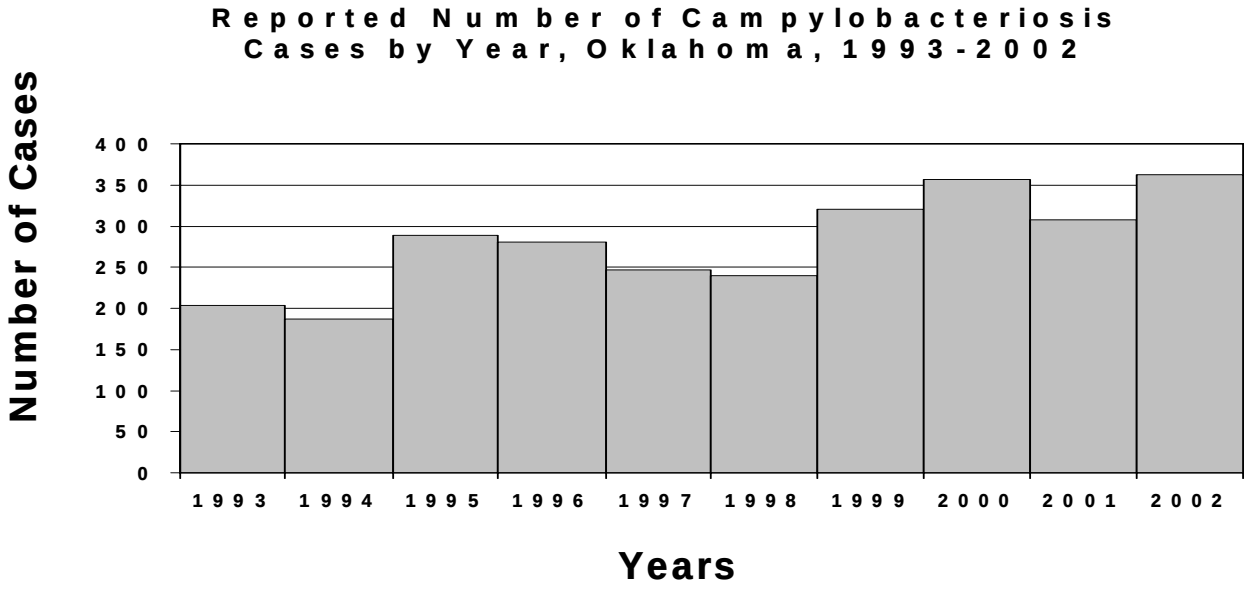
Enteric / Diarrheal Diseases

Campylobacteriosis

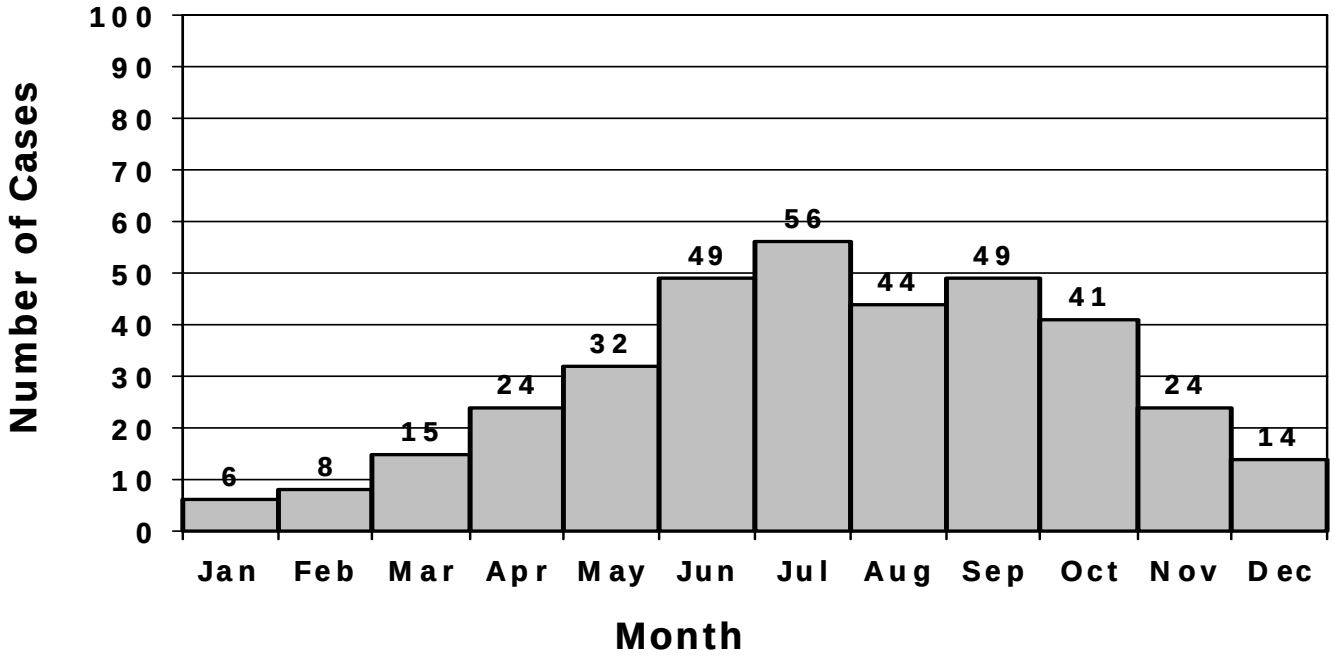
2002 Case Total **362**
Oklahoma Rate 10.49 per 100,000

Three hundred and sixty-two cases of campylobacteriosis were reported to the Oklahoma State Department of Health in 2002 representing an 18% increase compared to the number of cases in 2001 (308). The overall incidence rate in Oklahoma was 10.49 cases per 100,000 population. The rate of reported *Campylobacter* cases in 2002 was the highest incidence in the past 10 years. Furthermore, Oklahoma has reported an incidence rate of more than 10 cases per 100,000 State population only two other times over the previous 10 years, 2000 (10.35 cases per 100,000 population) and 1999 (10.20 cases per 100,000 population). Cases occurred among residents of 54 counties (70%). Cases were most frequently reported among residents of Oklahoma (33.7%) and Tulsa (12.4%) counties. County-specific rates ranged from 73.6 per 100,000 in Ellis County to 2.7 per 100,000 in Bryan County. The reported number of cases by month of symptom onset illustrated a typical seasonal trend where *Campylobacter* cases increased dramatically during the summer and fall months. Two-thirds of cases were reported during the months of June through October. In 2002, campylobacteriosis peaked in July with 56 (15.5%) cases.

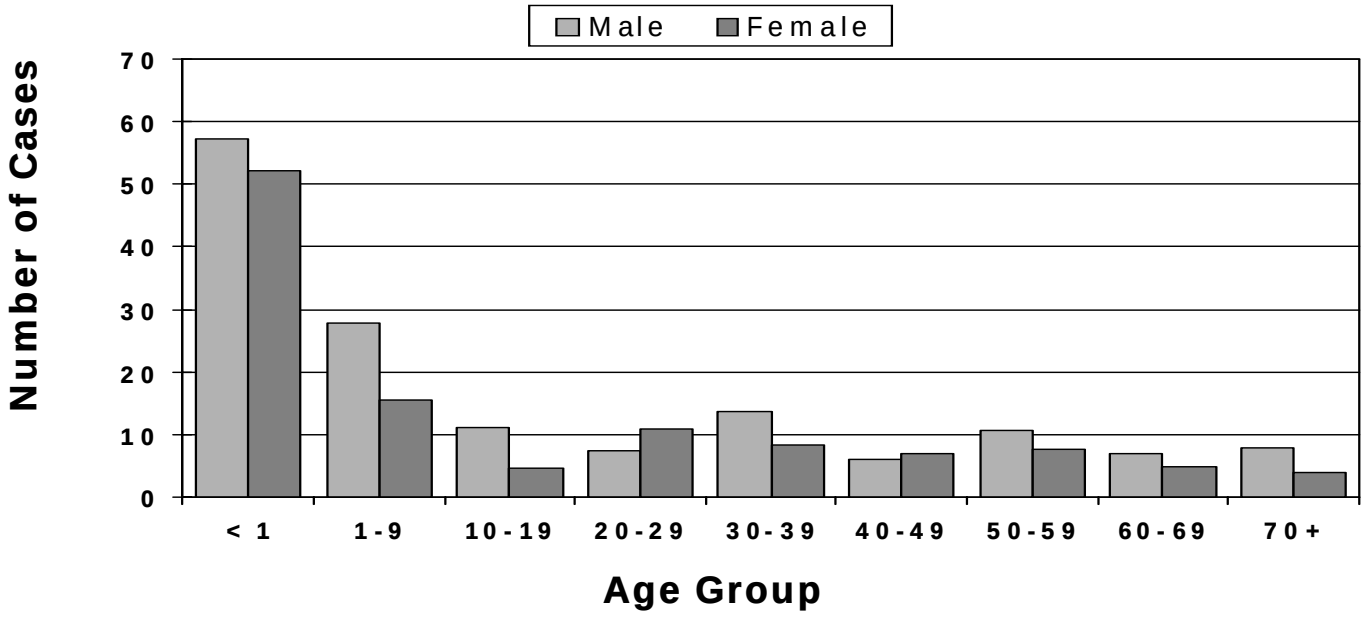
In 2002, cases ranged in age from 11 days to 91 years with a median age of 27. Infants and young children had the highest incidence of *Campylobacter* infections; the rate of reported cases was 54.7 per 100,000 population among children under the age 1 and 21.92 per 100,000 among children 1 to 9 years-old. Children aged $\leq$ 9 years accounted for 33% of cases and children aged < 1 year represented 7.2% of reported cases. Incidence rates were higher among males compared to females at 12.44 and 8.55 per 100,000 population respectively. Age-specific rates revealed a higher incidence of *Campylobacter* cases among males in 6 of the 9 (75%) 10-year age categories. Higher incidence rates were observed among females in the 20 to 29 year age group (10.8 per 100,000 female population versus 7.35 per 100,000 male population) and 40 to 49 year age group (7.06 per 100,000 female population versus 5.99 per 100,000 male population).



Number of Reported Campylobacteriosis Cases by Month, Oklahoma, 2002 (N=362)



Rate of Reported Campylobacteriosis Cases by Age Group and Gender, Oklahoma, 2002



Parasitic Diarrheal Diseases in Oklahoma

Three intestinal parasitic diseases are reportable in Oklahoma: giardiasis, cryptosporidiosis, and cyclosporiasis. Intestinal parasitic diseases may be associated with a variety of symptoms of gastroenteritis such as frequent loose stools, dehydration, weight loss, abdominal pain, fever, nausea and vomiting. Confirmation requires the identification of cysts or trophozoites in the feces. The collection of fecal specimens for ova & parasite (O&P) identification may not be a laboratory test that is routinely performed. When a parasitic etiology is suspected, clinicians should request testing for these specific organisms. Clinicians should also request several stool specimens from their patient since oocysts may be passed intermittently and may not be identified from just one stool specimen. Cases of giardiasis and cryptosporidiosis were reported in Oklahoma in 2002.

Cryptosporidiosis

2002 Case Total **16**
Oklahoma Rate **0.46 per 100,000**

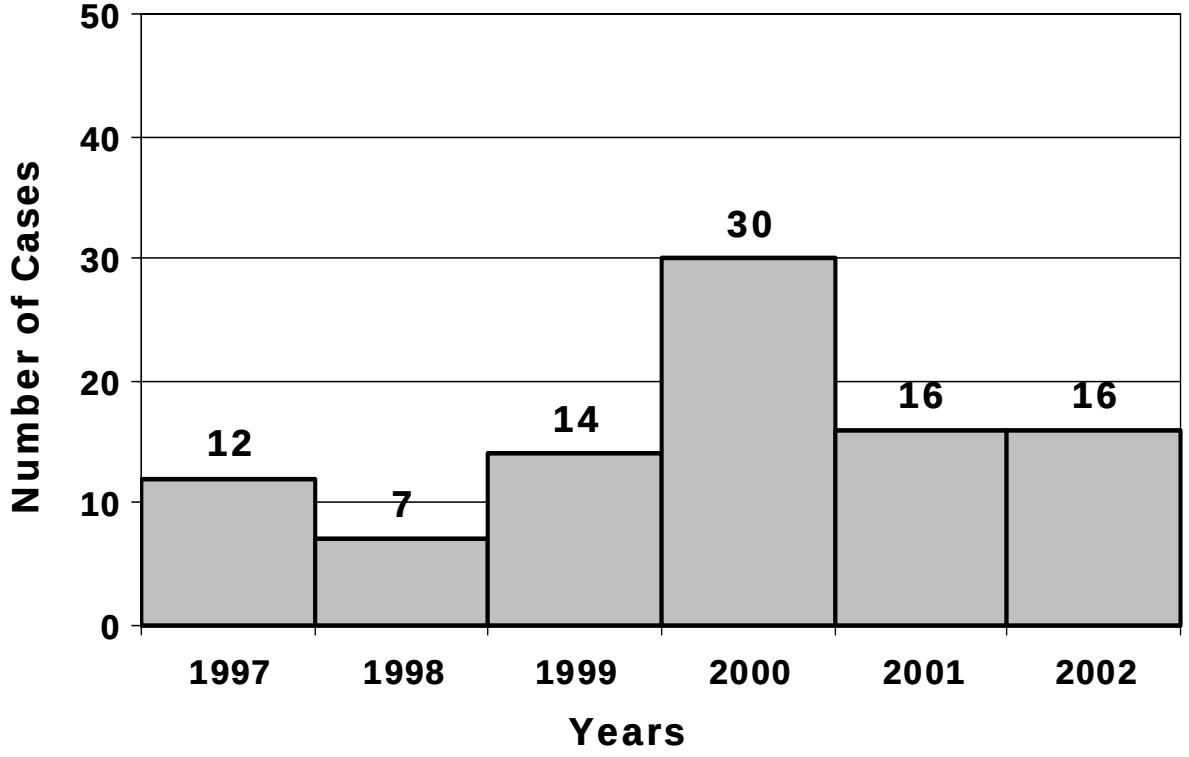
Sixteen cases of Cryptosporidiosis were reported to the Oklahoma State Department of Health in 2002, which is the same number of cases that were reported in 2001. The incidence rate in Oklahoma was 0.46 per 100,000 population, which is comparable to the previous five-year (1997-2001) Oklahoma rate of 0.48 per 100,000 population. The age range of Cryptosporidium cases was 9 months to 81 years with a median age of 23 years. Fifty-six percent (9) of reported cases were male. Cases occurred among residents of the following 9 counties: Carter (4), Tulsa (3), Oklahoma (2), Cleveland (2), Adair (1), Cherokee (1), Jackson (1), Mayes (1), and Pontotoc County (1).

Giardiasis

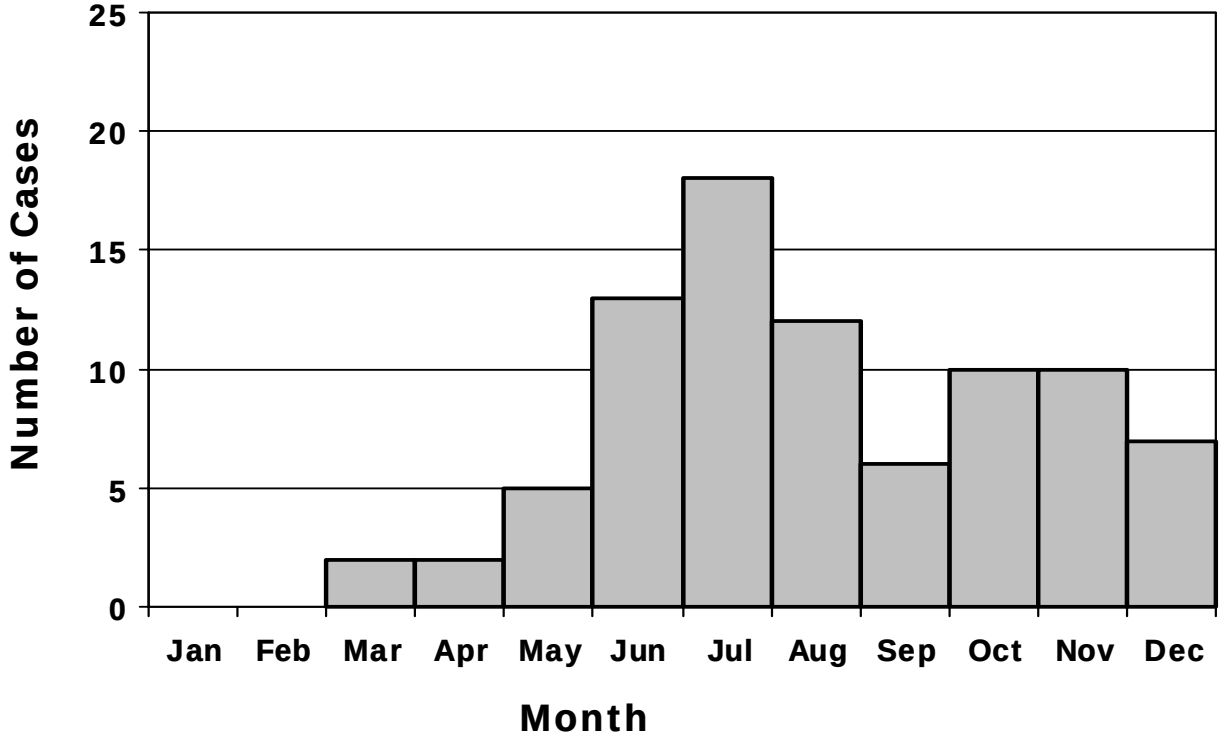
2002 Case Total **85**
Oklahoma Rate **2.46 per 100,000**

Giardia was removed from Oklahoma's list of reportable diseases in 2000 and was added back to the list in 2002. Eighty-five cases of *Giardia* were reported to the Oklahoma State Department of Health in 2002 representing an 11% decrease compared to the 96 cases reported in 2000. The incidence of *Giardia* disease in Oklahoma in 2002 was 0.75 cases per 100,000 population. Forty-one (48.2%) of the giardiasis cases were female. The rates of *Giardia* by racial group were 4.1 per 100,000 among Asian/Pacific Islanders (N=2), 2.7 per 100,000 among Blacks (N=7), 1.8 per 100,000 among Native Americans (N=5) and 2.5 per 100,000 among Whites (N=66). Regarding the distribution of *Giardia* by age, the highest rates of disease were observed in the young. The rate of disease among persons less than 5 years of age was 11.0 per 100,000 and the rate of disease among persons aged 5 through 9 was 4.5 per 100,000. There were no deaths due to *Giardia* in 2002.

Number of Reported Cryptosporidiosis Cases by Year, Oklahoma, 1997-2002



Cases of Giardiasis by Month of Onset, Oklahoma, 2002



Escherichia coli O157:H7 and Hemolytic Uremic Syndrome

2002 Case Total	25
Oklahoma Rate	0.73 per 100,000

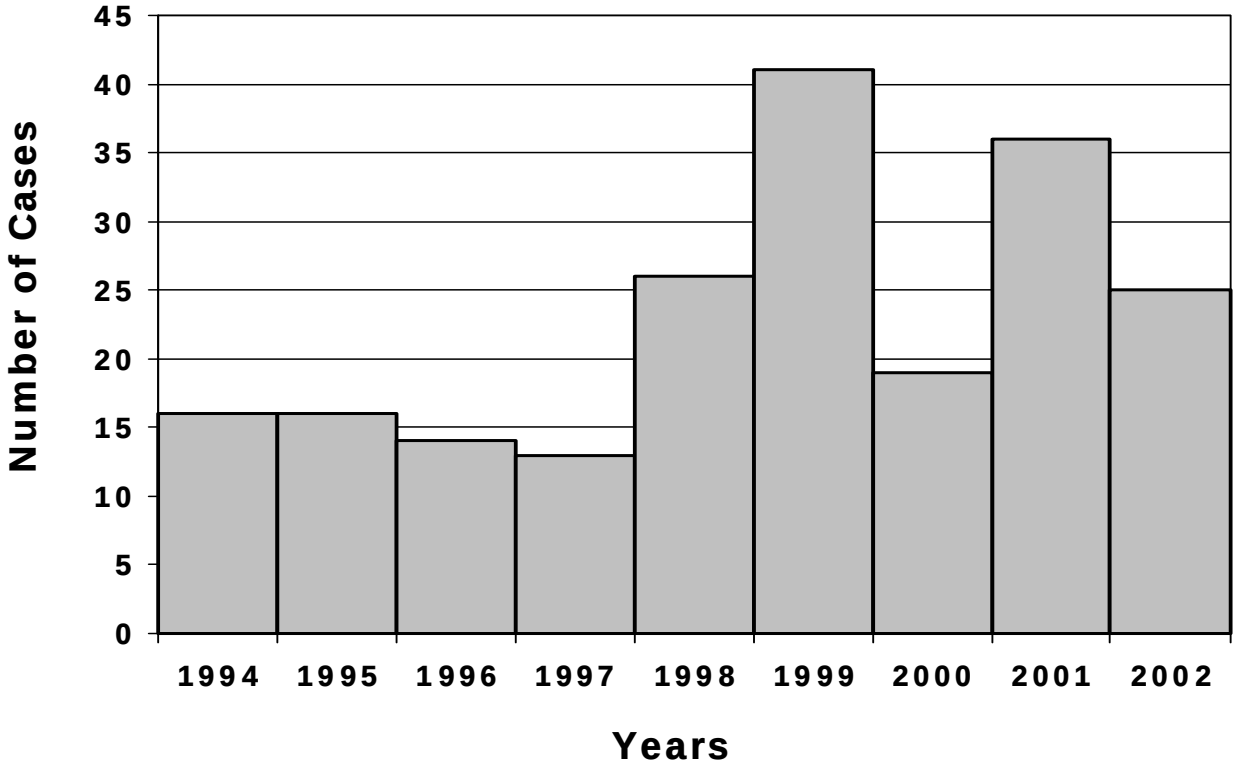
In 2002, the number of cases of *Escherichia coli (E. coli)* O157:H7 reported in Oklahoma was 25 (0.73 cases per 100,000 population), which is a 31% decrease from the 36 cases (1.04 cases per 100,000 population) reported in 2001. Cases of *E. coli* O157:H7 were reported throughout the year, peaking during the summer months in 2002. This seasonal distribution is consistent with data compiled since 1994 when *E. coli* O157:H7 became a reportable disease in Oklahoma.

The age distribution of *E. coli* O157:H7 cases ranged in age from 1 year to 83 years with a median age 10 years. Forty-eight percent of cases occurred in children less than 10 years of age resulting in an age-specific rate of 2.50 per 100,000 population. Sixty-eight percent of cases were female. Ninety-six percent reported their race as Caucasian , and 4% were Native American. *E. coli* O157:H7 cases were reported from 12 different counties with no geographic or temporal clustering observed. No *E. coli* O157:H7 outbreaks were investigated in Oklahoma during 2002.

Disease caused by *E. coli* O157:H7 ranges from asymptomatic infection to the potentially fatal complication hemolytic uremic syndrome (HUS). The following symptoms were reported from cases in 2002: diarrhea (96%), abdominal cramps (96%), bloody diarrhea (84%), vomiting (44%), and fever (48%). Forty-eight percent of cases required hospitalization, however, no cases were fatal. Approximately 2-7% of cases with disease caused by enterohemorrhagic *E. coli* (EHEC) strains, including O157:H7, develop HUS. Three cases of HUS were reported in Oklahoma during 2002. However, none of the reported cases of HUS had *E. coli* O157:H7 or other EHEC strains cultured from a stool specimen.

Since becoming a reportable disease in Oklahoma in 1994, a total of 206 cases of *E. coli* O157:H7 have been reported; an average of 22.9 cases per year. Due to the potential severity of disease associated with *E. coli* O157:H7 and other EHEC, timely reporting and investigating of all cases is critical. Suspected cases of *E. coli* O157:H7 and cases of HUS should be reported within one business day of diagnosis to the Communicable Disease Division. The OSDH Communicable Disease reporting regulations require isolates of suspected enterohemorrhagic *E. coli* to be sent to the PHL for typing.

Number of Reported Cases of *E. coli* O157:H7 by Year, Oklahoma, 1994-2002



Number of Cases

Months

Salmonellosis

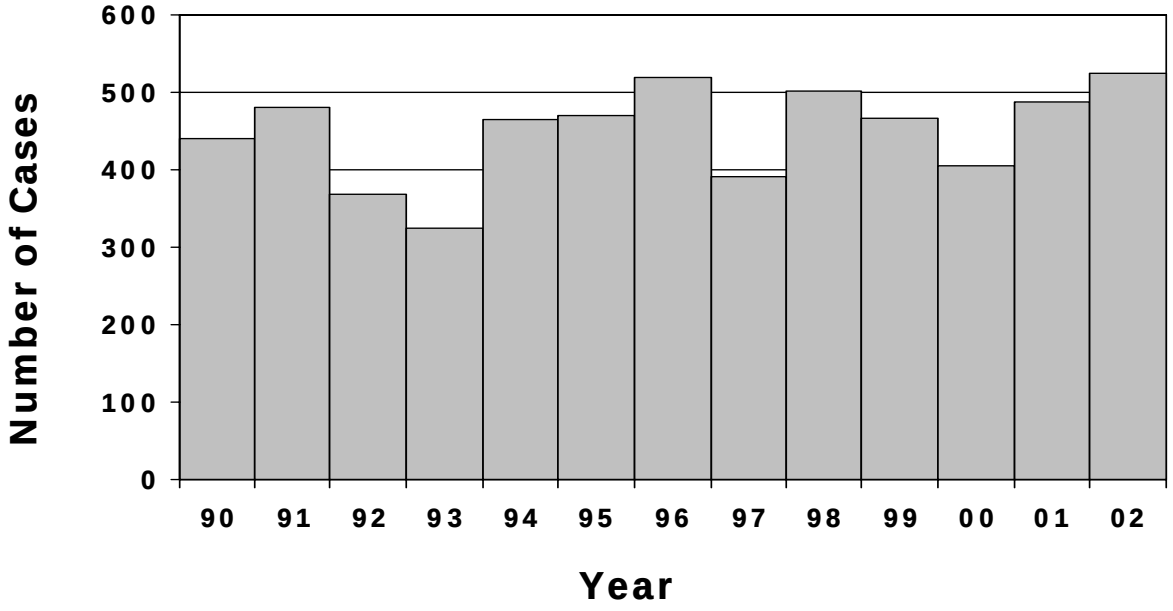
2002 Case Total	524
Oklahoma Rate	15.2 per 100,000

The number of reported Salmonellosis cases in 2002 was the highest in the past 13 years with five hundred and twenty-four cases reported to the Oklahoma State Department of Health. The overall rate in Oklahoma was 15.2 cases per 100,000 population compared to the 2001 rate of 14.5 cases per 100,000 population. Cases occurred among residents of 67 (87%) counties. County-specific rates ranged from 136 per 100,000 in Love County to 2.7 per 100,000 in Bryan County. Counties with elevated incidence rates in 2002 included Hughes county (63.6), Payne county (38.1), Caddo county (36.5), Atoka county (36), and Washita county (34.8). The reported number of *Salmonella* cases by month of symptom onset increased dramatically during the summer months; 51.5% of cases were reported for the months of June through September. This seasonal trend of reported cases is similar to what has been observed in previous years. Salmonellosis peaked in August with 80 (13.7%) cases.

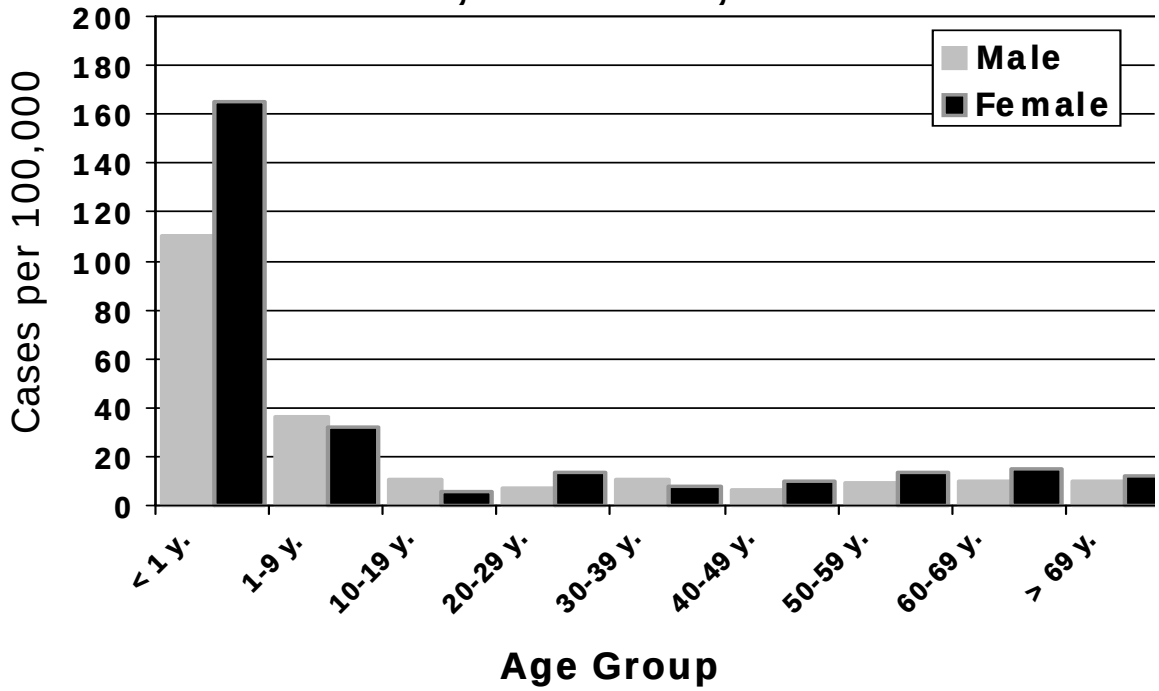
In 2002, cases ranged in age from 19 days to 94 years with a mean age of 26.2 years. Infants and young children had the highest incidence of *Salmonella* infections. Children less than 10 years of age accounted for 41.85% of cases and children less than 1 year of age represented 12.7% of reported cases. Gender specific rates were comparable between males and females at 14.1 and 15.27 per 100,000 population respectively. However, age-specific rates indicated salmonellosis infections occurred more frequently among females less than 1 year with a rate of 165 per 100,000 versus 110 per 100,000 among males less than one year. Rates were observed to be higher among females compared to males in the 40 to 49 year age group, 50 to 59 year age group, and 60 to 69 year age group. The incidence rate for Native Americans was higher at 19.8 per 100,000 than that of Whites at 15.2 per 100,000.

Fifty-two different serotypes were identified from isolates sent to the OSDH Public Health Laboratory. The two most frequently identified *Salmonella* serotypes in 2002 were *S. Newport* (21.2%) and *S. Typhimurium* (21%). *S. enteritidis* was the third highest (7.7%) reported serotype due to Oklahoma residents involved in an outbreak in Texas during the month of March.

Number of Reported Cases of Salmonellosis by Year, Oklahoma, 1990-2002



Salmonellosis Incidence Rate by Age and Gender, Oklahoma, 2002



Shigellosis

2002 Case Total	718
Oklahoma Rate	20.8 per 100,000

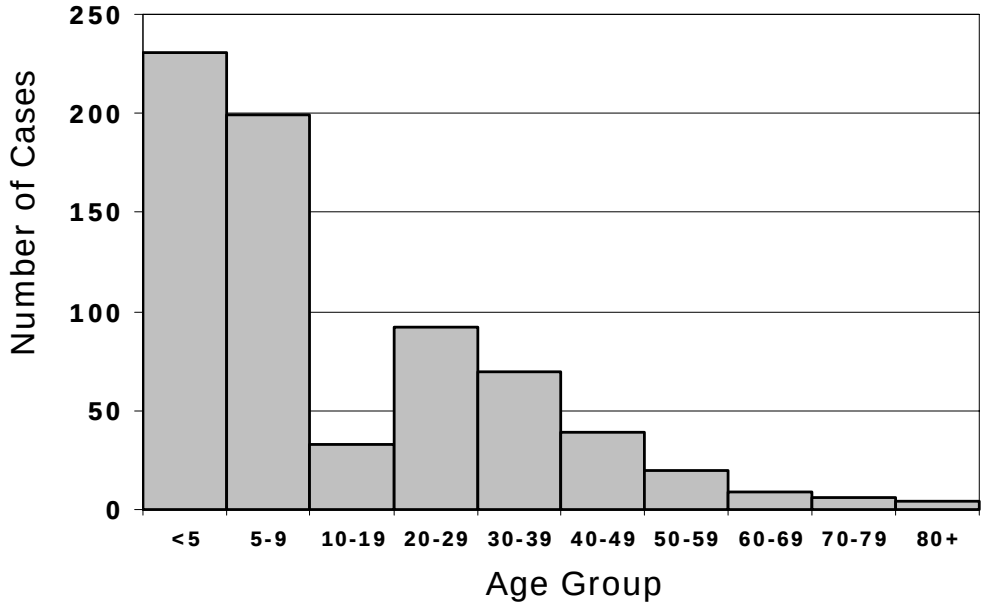
In 2002, outbreaks of shigellosis were all too prevalent in Oklahoma as the reported number of cases reached a 20-year high. A total of 718 cases (20.8 per 100,000 population) of Shigellosis were reported, approximately five times the number of cases reported in 2001 (4.26 per 100,000 population). Of the total cases reported in 2002, 67% were confirmed cases (*Shigella* isolated from a clinical specimen) and 33% were probable cases. *Shigella sonnei* is the most commonly identified *Shigella* species in the U.S and comprised 97% of the isolates speciated in Oklahoma in 2002. Other species identified included *S. flexneri* (13 cases), *S. boydii* (1), and *S. dysenteriae* (1).

Persons of every age, sex, race, and ethnicity are susceptible to disease caused by *Shigella.* However, 60% of cases were in children less than 10 years of age (89.6 per 100,000 population). The median age of reported cases of Shigellosis in 2002 was 7 years and ranged from 3 days to 86 years. Fifty-seven percent of the cases were female. For cases with a known race and ethnicity, the highest incidence rate of 40.6 cases per 100,000 population occurred in African Americans followed by Native Americans (24.5 per 100,000 population), Caucasians (18.0 per 100,000 population), and Asian (6.41 per 100,000 population). Nine percent of cases were of Hispanic ethnicity.

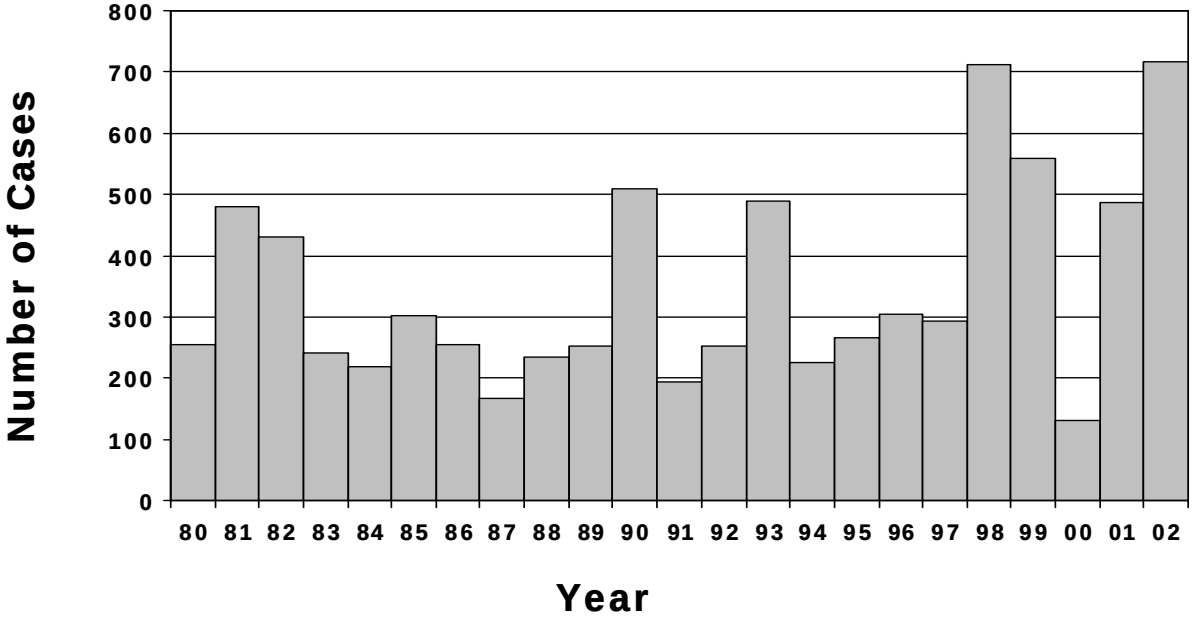
Shigellosis is typically a self-limiting enteric disease with cases experiencing a range from asymptomatic infections to more severe disease. In 2002, 100 (14%) cases required hospitalization and 2 deaths were reported. For cases whose symptoms were reported, the symptoms included diarrhea (99%), cramps (86%), fever (75%), nausea (62%), vomiting (49%), and bloody diarrhea (40%). Although shigellosis is usually a mild self-limiting disease, antibiotic therapy is recommended for persons in high-risk settings including foodhandlers, child-care-centers, long-term care facilities, and health care providers. Appropriate antibiotic therapy will reduce the length of shedding of the bacteria and possibly lessen the severity of illness.

In 2002, shigellosis cases were reported from 41 counties in Oklahoma. Three counties, accounted for 69% of the total number of reported cases; Oklahoma, Tulsa, and Ottawa County. The large numbers of cases in these counties is primarily the result of transmission within child-care settings (CCS). Data regarding CCS association was available for 620 (86%) of reported cases. For cases with a known exposure history, 46% of cases reported association to a CCS including attending (34%), working (2%), or was a family member to a child attending a CCS (11%). The low infectious dose of 10-100 organisms required to cause disease in combination with factors within a CCS result in a potentially high secondary attack rate within these facilities. Rapid investigation of reported cases, education of employees and family members, and appropriate antibiotic use for cases in high-risk settings is necessary to reduce the occurrence of further transmission and prevent additional cases.

Reported Shigellosis Cases by Age Group, Oklahoma, 2002



Number of Reported Cases of Shigellosis by Year, Oklahoma, 1980-2002



General Communicable Diseases

Botulism

2002 Case Total 1
Oklahoma Rate 0.029 per 100,000 population

Botulism is an uncommon but serious illness caused by a toxin that is produced by the bacterium *Clostridium botulinum*. There are 3 kinds of botulism that can occur, depending on the route of exposure. Foodborne botulism results from consuming foods that contain the toxin, wound botulism is caused by toxin produced from a wound infected with *C. botulinum,* and infant botulism results from consuming the spores of the botulinum bacteria, which then grow in the intestines and release toxin. In the United States, an average of 110 cases of botulism are reported each year. Of these, approximately 25% are foodborne, 72% are infant botulism, and the rest are wound botulism.[1]

Six cases of botulism have been reported in Oklahoma since 1991; 5 cases of infant botulism and 1 case of foodborne botulism. In 2002, 1 case of infant botulism was reported in a 2-week-old male from Oklahoma County. Type A botulinum toxin was detected in stool that was forwarded from the Public Health Laboratory (PHL) to the Centers for Disease Control and Prevention (CDC). In 1994, a single case of foodborne botulism in a 47-year-old resident of Eastern Oklahoma was reported to the Arkansas Department of Health and OSDH. The case had been admitted to an Arkansas hospital with dizziness, blurred vision, slurred speech, and difficulty swallowing. *C. botulinum* was isolated from stool and type A toxin was detected. An epidemiologic investigation indicated the case had eaten home-canned green beans and a stew containing roast beef and potatoes 24-hours before symptom onset. The stew had been cooked, covered, and left at room temperature for 3 days before consumption without reheating. Type A toxin was detected in a sample of leftover stew.[2]

Prompt diagnosis and early treatment are essential to minimize the risk of death. Routine laboratory studies are not helpful in confirming the clinical suspicion of botulism, however, several tests are recommended to help differentiate botulism from other potential diagnoses. Normal CSF protein levels help distinguish botulism from Guillain-Barre syndrome and brain imaging (CT, MRI) help to rule out stroke syndrome. A normal tensilon test helps to differentiate botulism from myasthenia gravis and when available, an expertly performed electromyography (EMG) can provide a rapid, definitive diagnosis.[1] Antitoxin can be requested from the CDC via the OSDH once differential diagnoses have been ruled out by performing the above mentioned tests. Administration of antitoxin should occur early in the course of illness. Collection of specimens should occur prior to initiation of antitoxin therapy to assist in confirming the diagnosis of botulism. Suitable specimens for examination of botulinum toxin are serum, feces, vomitus, gastric aspirate, wound and suspected foods.

Health care professionals should consider botulism in patients who present with symmetric cranial nerve palsies (ptosis, dyplopia, dysarthria, dysphagia) and bilateral flaccid paralysis. **Suspected cases should be reported immediately to the Communicable Disease Division (CDD)** by calling 405-271-4060, as one case is considered a public health emergency. Available services include assistance in requesting antitoxin, immediate investigation for other cases when an outbreak is suspected and identification of suspected sources, and confirmatory services through the OSDH Public Health Laboratory and CDC.

---

[1] Centers for Disease Control and Prevention: Botulism in the United States, 1899-1996. Handbook for Epidemiologists, Clinicians, and Laboratory Workers, Atlanta, GA. Centers for Disease Control and Prevention, 1998.

[2] Foodborne Botulism-Oklahoma, 1994. MMWR 1995; 44(11); 200-202.

Legionellosis

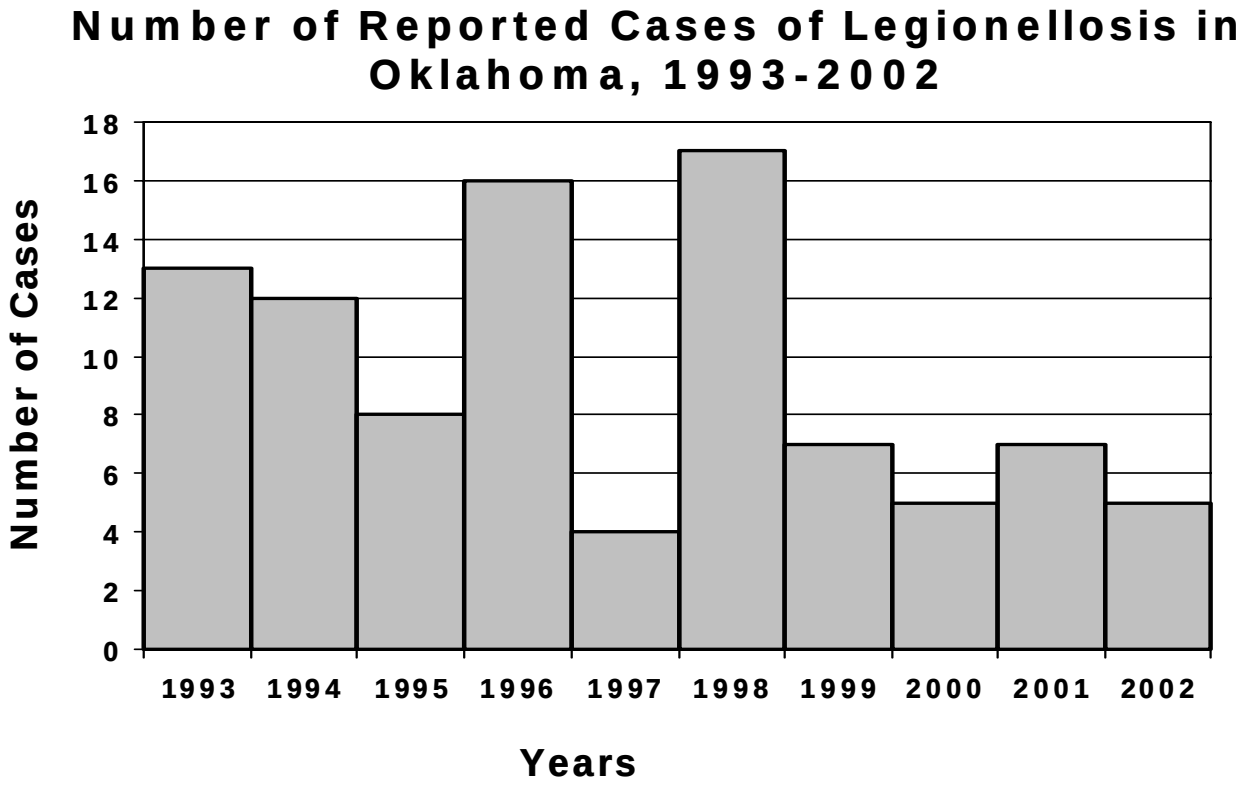
2002 Case Total	5
Oklahoma Rate	0.1 per 100,000

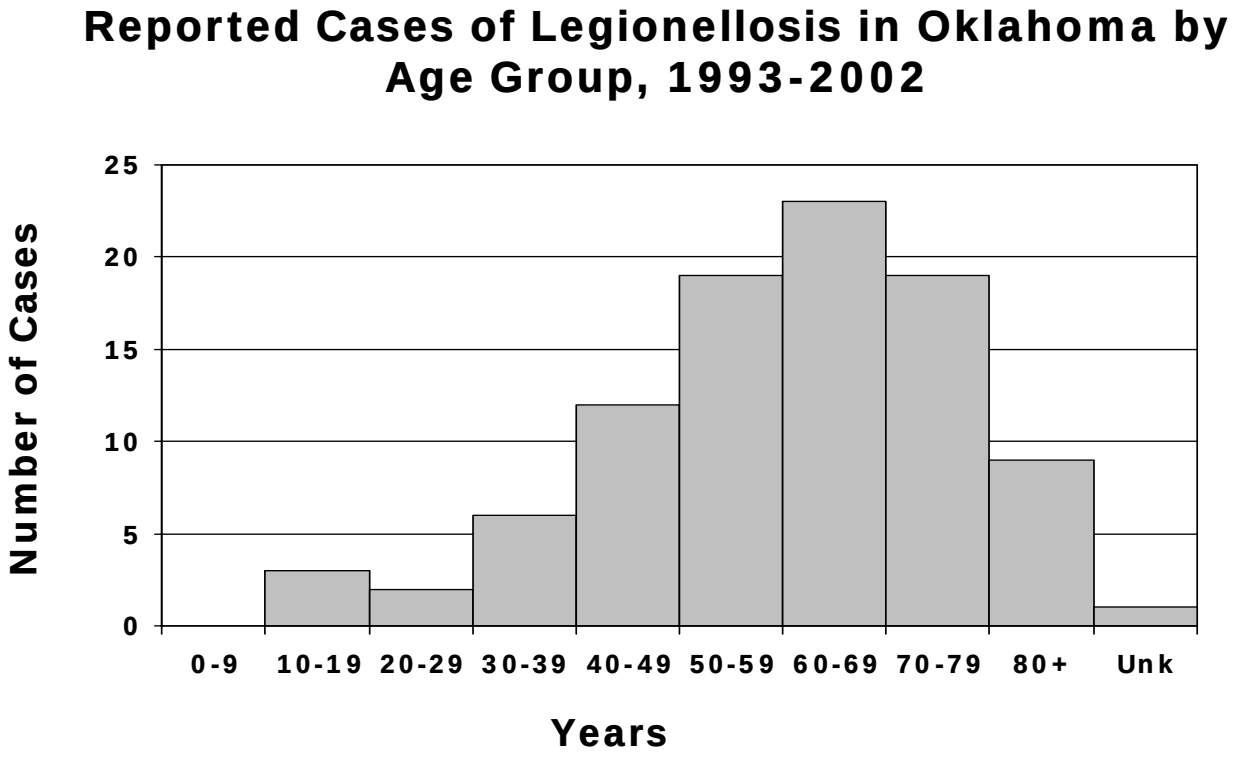
Five cases of legionellosis were confirmed in Oklahoma in 2002, a decrease from the seven cases confirmed in 2001. A majority of the cases were male (60%). The race of the five cases included 2 Caucasians (0.08 cases per 100,000 population) and 2 Native Americans (0.7 cases per 100,000); the race of one case was unknown. The age distribution of cases ranged in age from 19 to 71 years and had a median age of 55 years. All five cases were hospitalized, but none of the cases died due to Legionellosis. No geographic clustering was observed as cases were all from different counties across the central and northeastern parts of the state.

In the past 10 years, from 1993 through 2002, a total of 94 cases of legionellosis have been reported with an average of 9.4 cases reported annually. The median age of reported cases was 63 years and ranged from 14 to 91 years. For cases with a known race (91%), the distribution was 88% Caucasian, 6% Native American, 3% African American, 1% Asian, and 1% other. Hospitalization and outcome data was known for 92% and 68% respectively. For cases whose hospitalization and outcome status is known, 83 (97%) cases were hospitalized and 11 (17%) died. Cases were reported from 27 counties across Oklahoma, however, the majority of the cases were distributed across the central and northeastern parts of the state.

The Centers for Disease Control and Prevention case definition for legionellosis is fairly strict, requiring either a four-fold change in titer between acute and convalescent specimens or a positive urine antigen test, and x-ray evidence of pneumonia. Each laboratory report sent to the Communicable Disease Division is actively investigated.

Legionellosis Data





Malaria

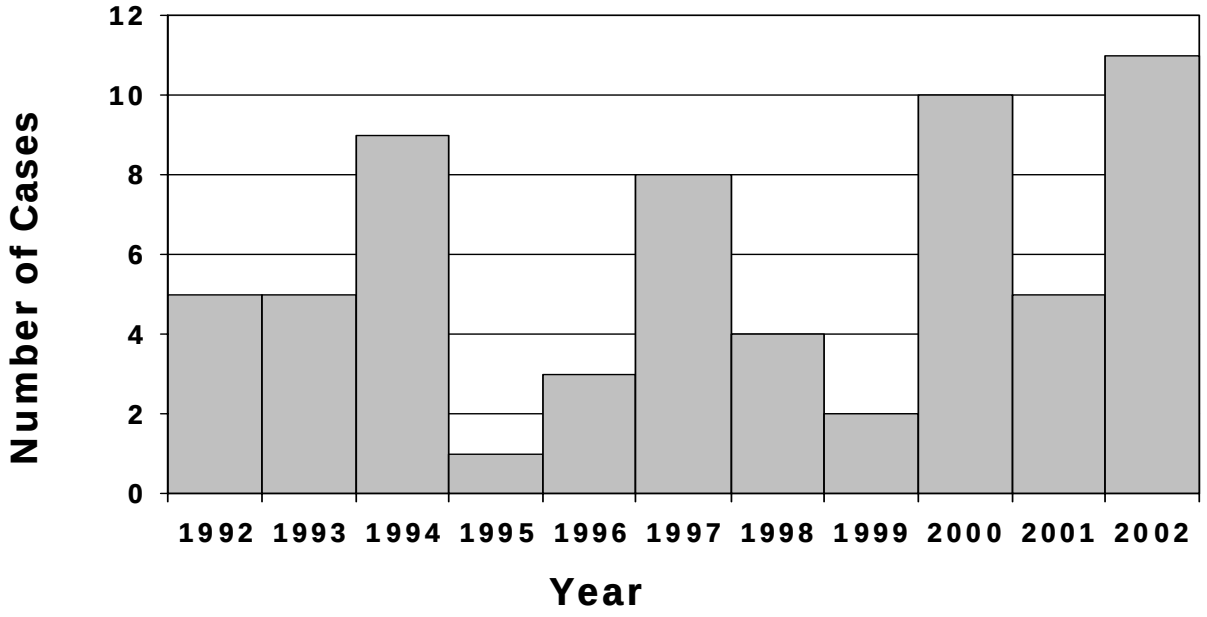
2002 Case Count 11
Oklahoma Rate 3.2 per 100,000

In 2002, there were 11 cases of malaria reported to the Oklahoma State Department of Health; all 11 cases were imported from malaria endemic countries. Cases were reported among residents of the following counties: Tulsa county (1), Oklahoma county (4), Cleveland county (2), Comanche county (2), Okmulgee county (1), and Stephens county (1). Cases ranged in age from 3 years to 74 years with a median age of ??. Five (45%) cases reported their racial backgrounds as black, 5 (45%) reported their race as white, and 1 (9%) reported their race as other. All 11 cases had reported recent travel to Africa, Guatemala, or New Guinea. No cases reported starting chemoprophylaxis (chloriquin) prior to travel. All 11 cases were diagnosed by blood smear.

Oklahoma disease reporting rules require laboratories to send blood smears with *Plasmodium* species identified for species identification. Blood smears for all 11 cases were forwarded to the Public Health Laboratory in 2002; 3 (27%) were plasmodium species, 5 (45%) were falciparum, and 3 (27%) were vivax species. Five (45%) cases were hospitalized, but none of the cases died due to malaria.

Oklahoma's imported malaria cases underscores the importance of starting chemoprophylaxis prior to traveling to malaria endemic countries. Every year, millions of United States residents travel to countries where malaria is present; approximately 800 cases are diagnosed in these travelers each year. Persons who are traveling to malaria-risk areas can reduce their risk of malaria by correctly taking an antimalarial drug and follow measures to prevent mosquito bites. The Center for Disease Control has numerous resources on current malaria endemic countries as well as areas that are known to be resistant to commonly used drugs for chemoprphylaxis. These resources can be accessed online at www.cdc.gov.

Number of Reported cases of Malaria by Year, Oklahoma, 1992-2002



Rabies (Animal)

2002 Oklahoma Total 126

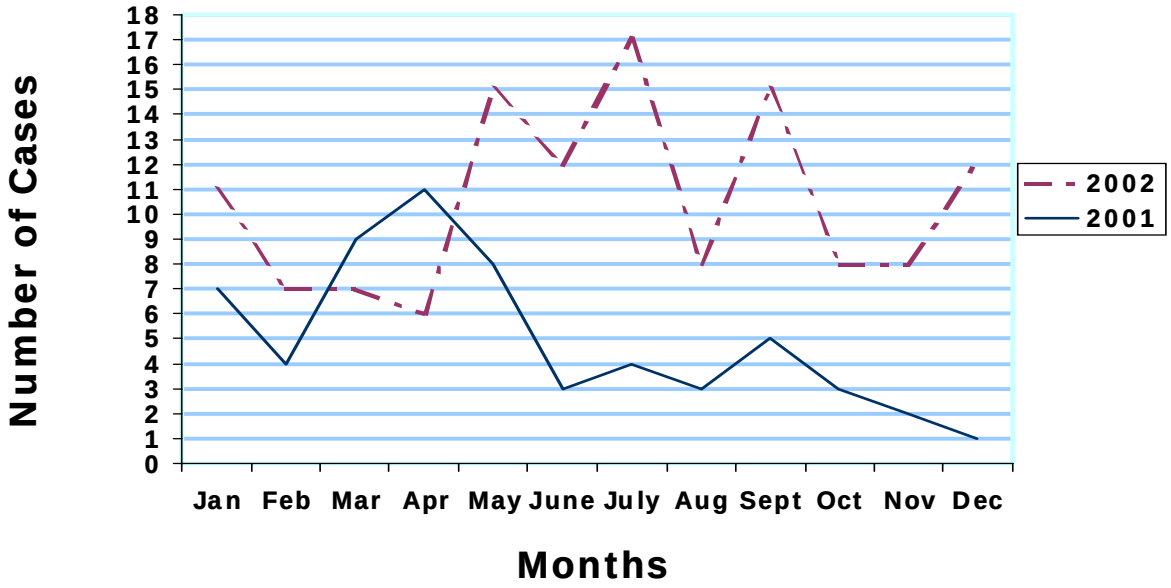
Rabies surveillance is primarily laboratory-based and the Oklahoma State Department of Health (OSDH) Laboratory is the only approved rabies testing laboratory in the state. The OSDH Laboratory employs a direct fluorescent antibody test on three different anatomic regions of the brain (medulla, cerebellum, and hippocampus). A conclusive test result requires that at least two of these three brain sections be tested in an animal. If an animal tests positive for rabies virus infection, an epidemiologist with the Communicable Disease Division (CDD) immediately launches a human and animal exposure risk assessment and provides recommendations for any human rabies post exposure prophylaxis. Exposed persons are referred to their personal health care provider for administration of the human rabies vaccine and immune globulin. Any livestock or pets deemed to be exposed to a rabid animal are managed according to the state's zoonotic disease control rules (OAC 310, Chapter 599).

During 2002, a total of 1,766 animal brain tissue specimens were submitted to the OSDH Laboratory for rabies testing. Seven percent (126/1,776) tested positive for rabies. By species, the 126 rabid animals included 92 skunks, 9 dogs, 8 bats, 7 cats, 5 horses, 4 cattle, and one fox. Peak incidence occurred during the month of July with seventeen cases identified. Compared to the previous year, overall incidence of animal rabies was increased by 52%. Oklahoma counties with the most animal rabies activity in 2002 were located in the central or southeastern part of the state. Seven counties were the origin of at least six rabid animals, namely Garfield county with 10 cases; LeFlore, Seminole, and Oklahoma counties with 9 cases each; Pottawotomie and Logan counties with 8 cases apiece, and Johnston county with 6 cases.

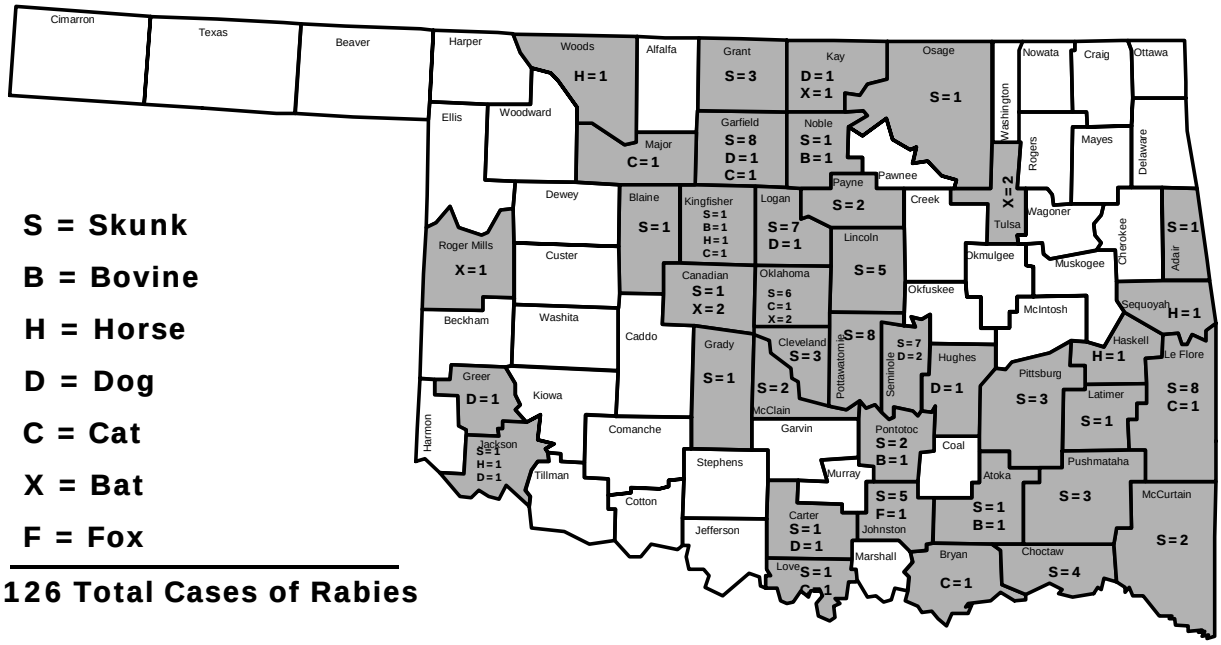
Human exposure was assessed by CDD epidemiologists in twenty-five (21%) of the state's animal rabies case investigations with an average of two persons (range: 1-12) exposed per case. A sum of 235 domestic animals were exposed to rabid animals in the household resulting in the euthanasia of 147 (62.5%) exposed and unvaccinated pets. Although a state rabies vaccination mandate exists for all dogs, cats, and ferrets over the age of four months, poor compliance by animal owners continues to be a problem. For more comprehensive information on rabies, a rabies resource manual entitled, "Rabies Prevention in Oklahoma: Guidelines for the Management of Animal Bite Incidents and Possible Rabies Exposures in Humans and Animals" is available for downloading from the OSDH website at
http://www.health.state.ok.us/program/cdd/RabiesGuide01.pdf

Rabies (Animal) Data

Number of Animal Rabies Cases by Month of Diagnosis -- Oklahoma, 2001 - 2002



Oklahoma Counties With Laboratory-Confirmed Animal Rabies Cases 2002



Tuberculosis

2002 Case Total	**190**
Oklahoma Rate	5.5 per 100,000

Tuberculosis caused by *Mycobacterium tuberculosis* is a treatable, curable and preventable disease. TB incidence in Oklahoma is low compared to many other diseases, yet it continues to be an important cause of morbidity and mortality in Oklahoma. In 2002, 190 Oklahomans experienced active tuberculosis (incidence rate 5.5/100,000). A slowly declining TB incidence is occurring but eradication of TB from Oklahoma will require continued diligent effort.

Tuberculosis in Oklahoma is both urban and rural. In 2002, 78/190 (41%) cases were residents of Oklahoma and Tulsa County. The other 112 cases were scattered over the state. TB can occur anywhere across the state with many counties having one or two cases. TB is also sporadic and episodic with counties having years where TB does not occur, followed by its reoccurrence.

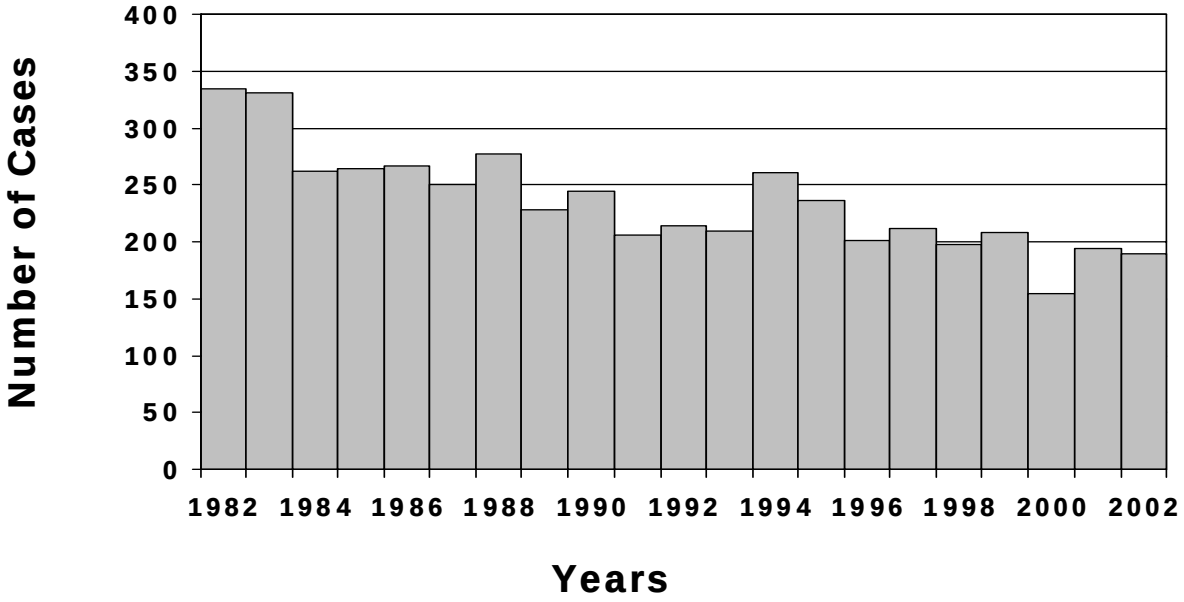
TB is primarily a disease of adults with the greatest burden of disease in those over age 65, 34/190 (17%) cases in 2002 (7/100,000) occurred in this age group. Trends in the last 5 years reveal an increase in the 45 – 64 and 25 – 44 cohorts. TB does occur in the young but this usually results from exposure to contagious adults in the child's life. The occurrence of TB in special populations in 2002 was as follows: homeless, 13 cases; nursing home cases, 7; AIDS/TB co-disease, 4; and prisoners, 9 cases. Resistance to Isoniazid was observed in 5% (6/110) of culture confirmed cases in 2002.

Oklahoma incidence rates by race/ethnicity in 2002 are as follows: White 4/100,000, Black 19/100,000, American Indian 10/100,000, Hispanic 9/100,000 and Asian 34/100,000. The foreign-born population accounted for 13% of all new cases of tuberculosis in 2002, with 3% of the cases occurring in foreign-born university students.

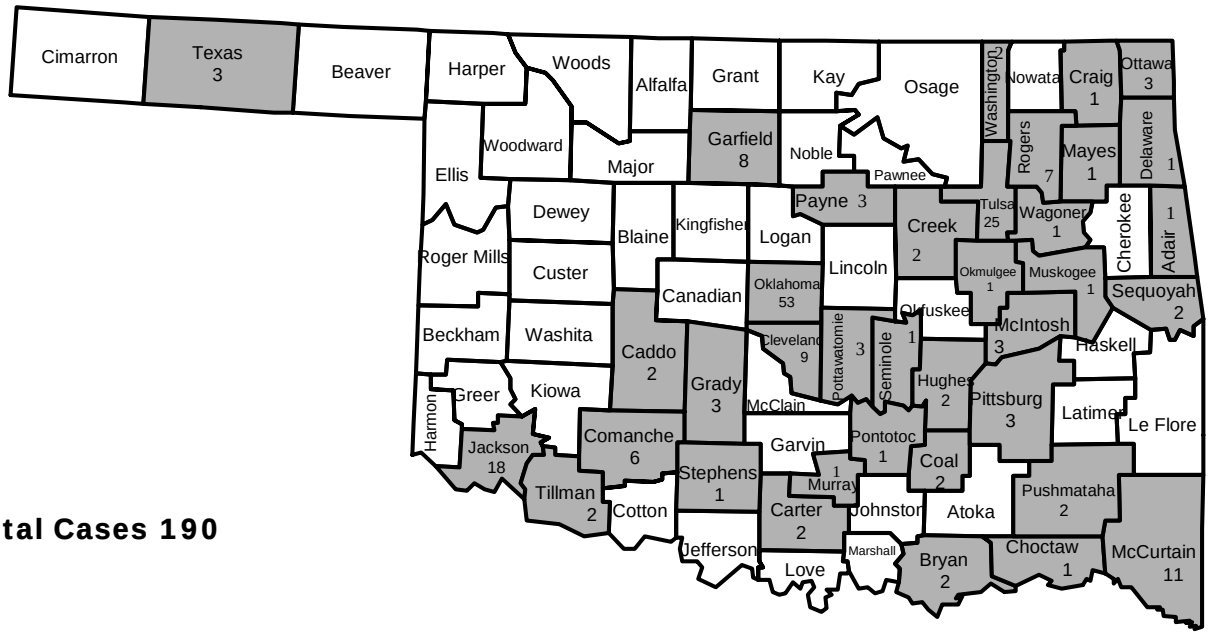
In 2002, there were two TB outbreaks: a large outbreak in Southwest Oklahoma involving Jackson, Comanche and Tillman Counties, which started in 2001 continued until late 2002, and an outbreak in a private prison facility. The Southwest TB Outbreak resulted from the index case going undiagnosed for eight months, living in three counties during this time and exposing over 1,312 persons to TB. Thirty-seven secondary cases have occurred. Eighteen percent of all outbreak related contacts were found to be infected with TB. The prison outbreak resulted in 2 initial cases exposing at least 1,025 contacts. Eleven secondary cases occurred in this outbreak with 19% of related outbreak contacts found to be infected with TB.

Tuberculosis Data

Reported Tuberculosis Cases, Oklahoma, 1982 - 2002



Geographic Distribution of Reported Tuberculosis Cases by County, Oklahoma, 2002



Total Cases 190

Hepatitis

Hepatitis A

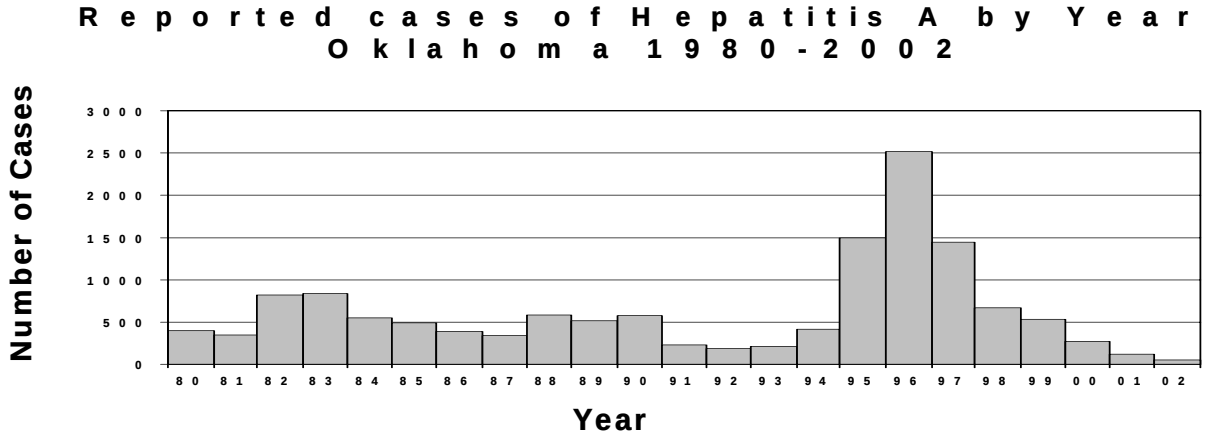
2002 Case Total **52**
Oklahoma Rate 1.51 per 100,000

The incidence of hepatitis A continued to decline in 2002, as it has each year following the statewide epidemic which occurred during the years 1995 through 1997. Fifty-two cases of hepatitis A were reported to the Oklahoma State Department of Health in 2002; the incidence rate of reported cases was 1.51 per 100,000. This is a decrease of 55% compared to 2001 (N=116). No outbreaks of hepatitis A were identified in 2002.

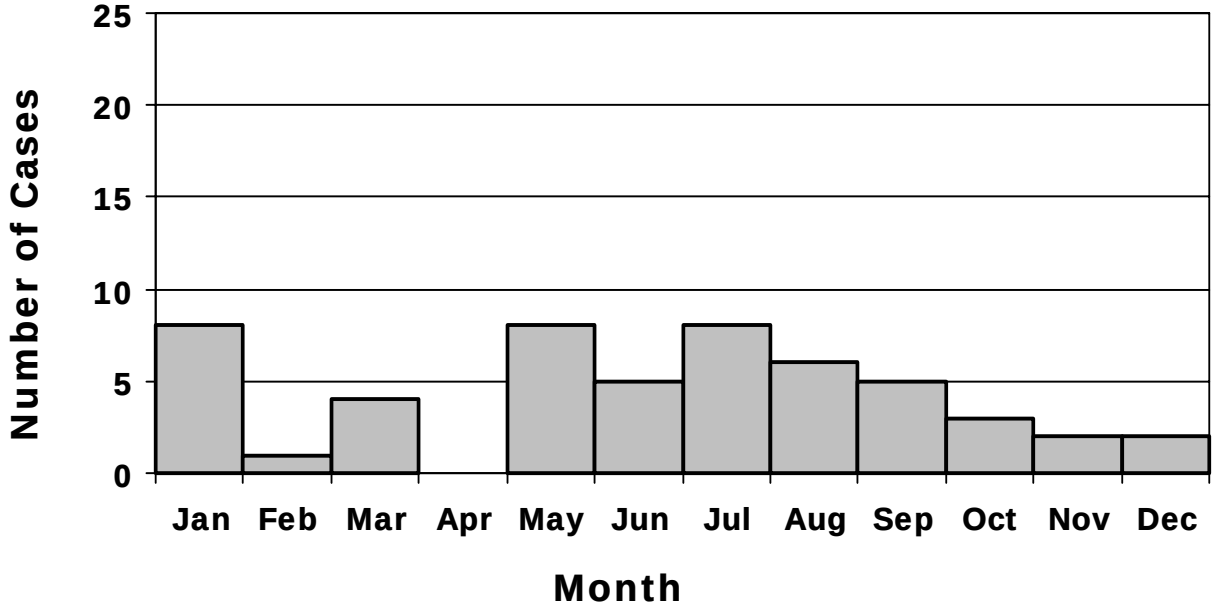
Cases were reported from 18 counties in 2002. Counties with the highest rates of hepatitis A included: Cimarron county with a rate of 63.5 per 100,000 (N=2), Texas county with a rate of 14.9 per 100,000 (N=3), and LeFlore county with a rate of 10.4 per 100,000 (N=5). The incidence rate of disease in Oklahoma county was 1.1 per 100,000 (N=7) and the incidence rate in Tulsa county was 2.7 per 100,000 (N=15).

Forty-two cases (80.8%) were white, three cases (5.8%) were Native American, three cases (5.8%) were black, and two cases (3.8%) were Asian. Race could not be determined for two cases. Twenty-four cases (46%) were female. In 2002, the cases ranged in age from 6 to 84 years with a median age of 31. Seventy-five percent of cases were 20 through 49 years of age. Thirty-eight (73%) cases were reported to have jaundice, 41 (82%) reported dark urine, and 20 (40%) reported clay-colored stool. Thirteen cases were hospitalized and none died.

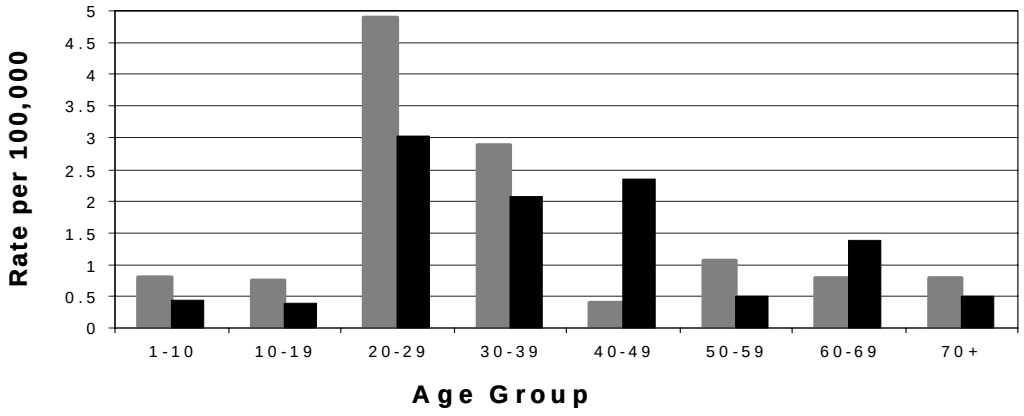
County health department Communicable Disease Nurses perform rapid follow-up of hepatitis A cases to determine risk factors for disease and prevent transmission of the virus to contacts through administration of immune globulin and education. Six cases reported consumption of raw shellfish during the exposure period. Thirteen cases (26%) reported travel outside of the area of residence: 4 reported travel to Central or South America, 1 reported travel to the Middle East, 1 reported traveling to Asia/South Pacific, and the remainder traveled to other unspecified places. Six (12.2%) of the hepatitis A cases were reported to be a contact to a case. A total of 56 doses of immune globulin were given through the county health departments to contacts of cases. One case was a food handler, however, an investigation conducted by the county health department and CDD determined there was not a risk of transmission to patrons of the foodservice establishment.



Cases of Hepatitis A by Month of Onset, Oklahoma, 2002



Rate of Reported Hepatitis A Cases by Age and Gender, Oklahoma, 2002 (N=52)



Hepatitis B

2002 Case Total 110
Oklahoma Rate 3.15 per 100,000

Hepatitis B (HBV), a double-stranded DNA virus, is a member of the Hepadnaviridae family, and is known to cause acute and chronic hepatitis. Worldwide estimates suggest that more than 2 billion persons are infected, of those 350 million are estimated to be chronic carriers. Each year more than 4 million new acute cases occur. Most of these cases are in countries where HBV is highly endemic, and most infections occur in infancy and early childhood. In areas with low endemicity, most new infections occur in young adults and high-risk populations. More than 250,000 persons die worldwide each year of hepatitis B-associated acute and chronic liver disease.

In 2002, 569 positive laboratory tests for hepatitis B were reported to the Oklahoma State Department of Health. Of the 569 tests, 110 were classified as acute infections based on serology, symptoms, and elevated aminotransferase levels. Three hundred and twenty-five (58%) of the positive tests were male and 237 (42%) were female. The majority of positive tests were reported in the 20 to 49 year age group, representing more than 74% of all ages, with the highest percentage (26%) being 20-29 years old. Among ethnic and racial groups, Caucasians had the highest percentage with 46%. 51 (9%) of the 524 reported positive tests were hospitalized due to Hepatitis B, and 10 (1.8%) died as a result of Hepatitis B.

Transmission of hepatitis B occurs by percutaneous (IV, IM, SC or intradermal) and permucosal exposure to infective body fluids, and is most commonly transmitted through sexual or household contact with an infected person, perinatal transmission, injecting drug use, nosocomial exposure, exposure to blood or blood products, hemodialysis, acupuncture and needlesticks or other injuries from sharp instruments sustained by hospital personnel. Hepatitis B has been found in blood and blood products, saliva, cerebrospinal, peritoneal, pleural, pericardial, synovial and amniotic fluids, semen and vaginal secretions and all other body fluids containing blood.

In 1981, a plasma-derived vaccine was licensed in the United States for the prevention of hepatitis B. The vaccine was safe and effective, yet not well accepted. It was removed from the U.S. market in 1992 and replaced by the recombinant hepatitis B vaccine in July 1986. This vaccine was the first licensed in the United States produced by recombinant DNA technology. The vaccine is 80% to 100% effective in preventing infection in those who receive the complete course of vaccine. Booster doses of vaccine are not recommended for adults and children with normal immune status.

Hepatitis C

2002 Case Total 21
Oklahoma Rate 0.6 per 100,000

A member of the Flaviviridae family, the hepatitis C virus (HCV) is a small, single-stranded RNA virus with at least six different genotypes and more than 90 subtypes. It is estimated that 1% of the world's population, and 3.9 million persons in the United States are infected with HCV.

A total of 2364 positive laboratory tests for hepatitis C were reported to the Oklahoma State Department of Health in 2002. This represents a 28% increase from the 1846 in 2001. Twenty-one (.01%) of the 2364 were classified as acutely infected based on the Centers for Disease Control and Prevention acute case definition. Of the reported tests, 1348 (57%) were male and 1005 (43%) were female. The majority of cases were 30 to 59 years old, with the highest percentage (45%) being 40-49 years old. Caucasians had the highest percent of infected persons (46%) among ethnic and racial groups. Of the 2364 positive tests, 79 (3.3%) were hospitalized due to Hepatitis C, and 16 (.68%) died as a result of Hepatitis C.

HCV is primarily transmitted through parenteral exposure. It is estimated that 60% to 90% of infections occur in persons with large or repeated direct percutaneous exposure to blood or blood products, such as injection drug users. Moderately high rates (10% to 20%) occur among those with frequent but smaller direct percutaneous exposures, such as patients receiving hemodialysis, and lower rates are found among those without apparent percutaneous or mucosal exposures, such as persons with high-risk sexual behaviors (1% to 10%), or health care personnel (1%). Contaminated body fluids can also be sources of infection. Sexual transmission among monogamous couples and transmission among family contacts is uncommon but could occur from direct or unknown exposure to blood. Perinatal (maternal-infant) transmission occurs in 5% of cases. However, coinfection with human immunodeficiency virus (HIV) has been associated with an increased risk of perinatal transmission of HCV.

Diagnosis of hepatitis C remains difficult. Antibody assays for anti-HCV and assays to detect HCV nucleic acid (RNA) are the two major types of tests available for laboratory diagnosis of HCV infection. Diagnosis of antibody assays involves an initial screening enzyme immunoassay (EIA), and repeated positive results are confirmed by a recombinant immunoblot assay (RIBA). The EIA and RIBA assays are approximately 97% sensitive and more than 95% specific.

The goal of treating chronic hepatitis C is to prevent the progression of the disease. Although there are few differences in clinical features or disease progression and outcome, many differences exist in responses to antiviral therapy according to HCV genotypes. With the advent of combined interferon/ribavirin therapy, treatment of chronic HCV has improved over the past decade. However, problems regarding relapse and poor responsiveness remain.

Meningitis / Septicemia

Haemophilus influenzae invasive disease

2002 Case Total **53**
Oklahoma Rate 1.54 per 100,000

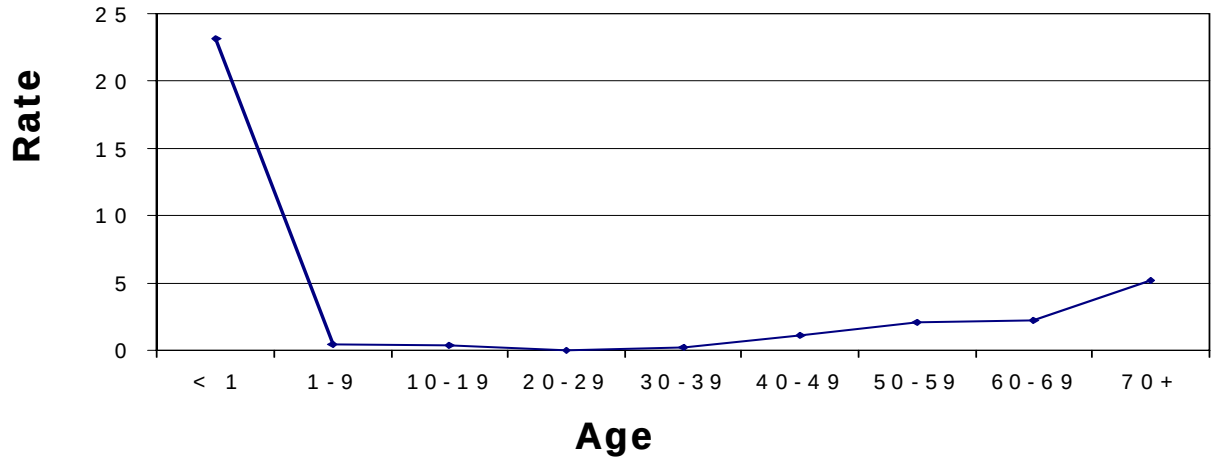
The incidence of *Haemophilus influenzae* invasive disease in Oklahoma has increased slightly from 1.39 cases per 100,000 in 2000 to 1.54 cases per 100,000 population in 2002. There were 53 cases of invasive *Haemophilus influenzae* reported in 2002, while 48 cases were reported in 2001 and 46 cases were reported in 2000.

Laboratories in Oklahoma are required to submit sterile-site isolates of *Haemophilus influenzae* to the Oklahoma State Department of Health Public Health Laboratory (OSDH PHL) for confirmation and serotyping. Fifty-two (98%) of the *H. influenzae* case isolates were serotyped by the OSDH PHL. Seven isolates (13%) were serotype a, one (1%) was serotype b, six (11%) were serotype c, three (5%) were serotype d, two (3%) were serotype e, eleven (21%) were serotype f, and 22 (42%) were non-typeable. The serotype b isolate was not from a child less than five years of age.

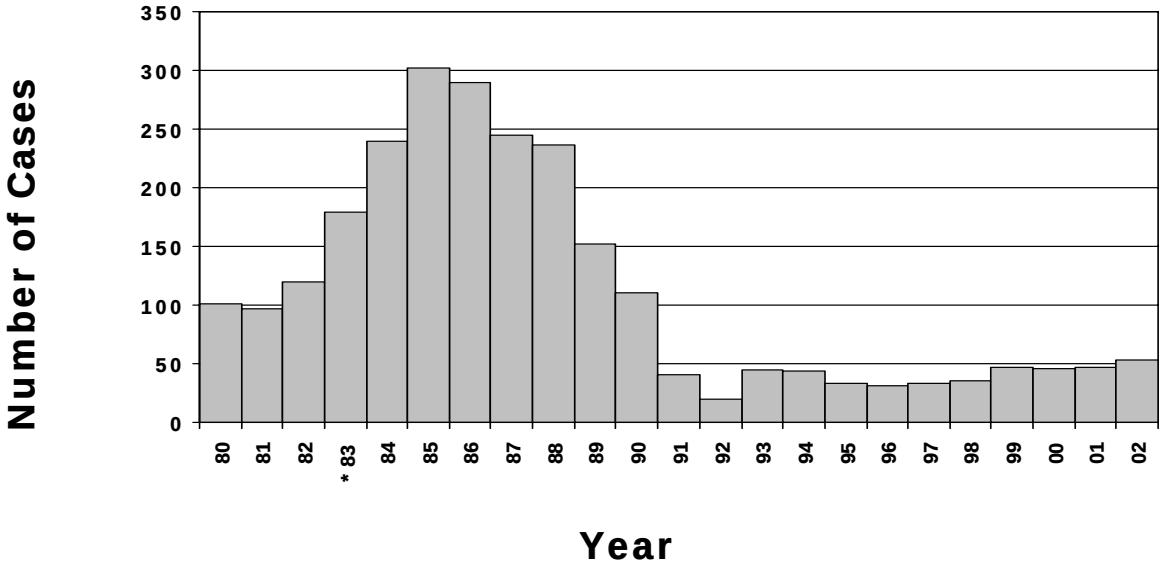
Twenty-five cases (47.2%) were female. The rates of *Haemophilus influenzae* invasive disease by racial group were fairly similar among Asian/Pacific Islanders (n=1) and Blacks (n=6) with a rate of 2.0 per 100,000 and 2.3 per 100,000 respectively; the rate among Whites (n=37) was 1.4 per 100,000 and Native Americans (n=8) had the highest rate at 2.9 cases per 100,000 population.

The age groups with the highest observed rates of *Haemophilus influenzae* invasive disease were the young and old. The rate of disease among infants through persons 4 years of age was 5.1 per 100,000. The rate of disease among persons aged 75 through 84 years old was 4.5 per 100,000. The rate of disease among persons greater than 84 years old was 12.2 per 100,000. Twelve cases died for an overall case fatality rate of 22.6%.

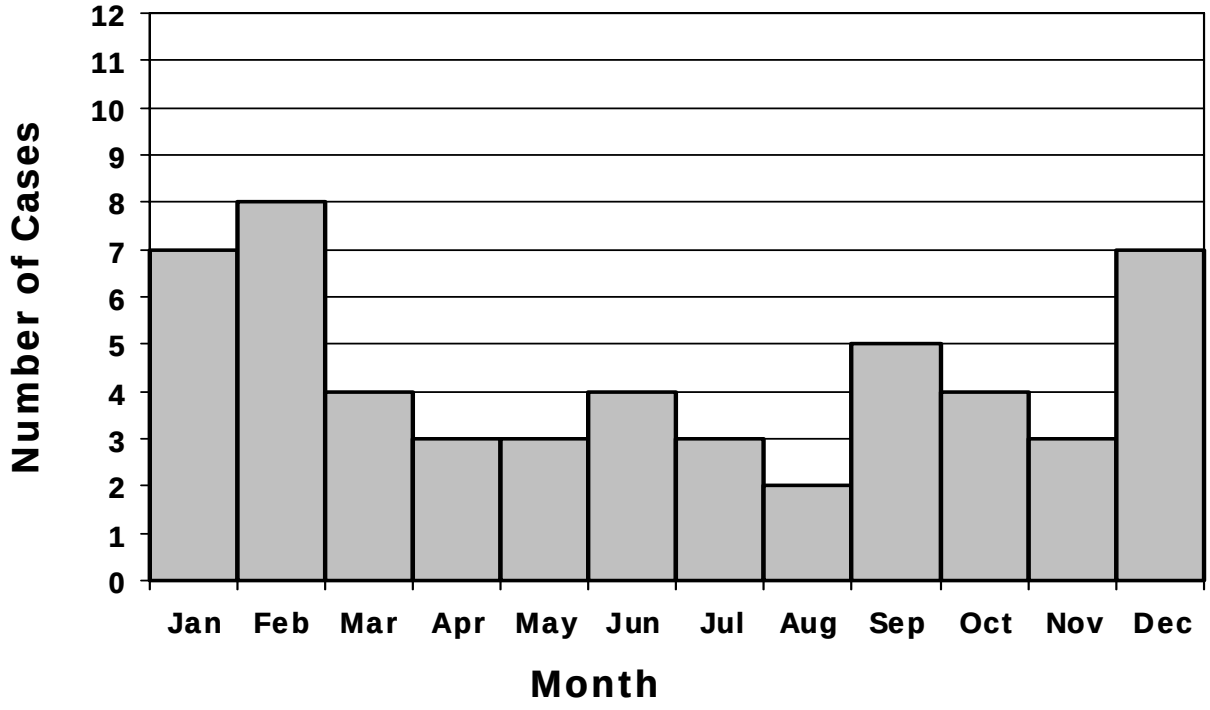
Rate of *H. influenzae* Invasive Disease by Age, Oklahoma, 2002



Number of Cases of *Haemophilus influenzae* invasive disease by Year, Oklahoma, 1980-2002



Cases of Invasive *H. influenzae* by Month of Onset, Oklahoma, 2002



Invasive Group A *Streptococcus*

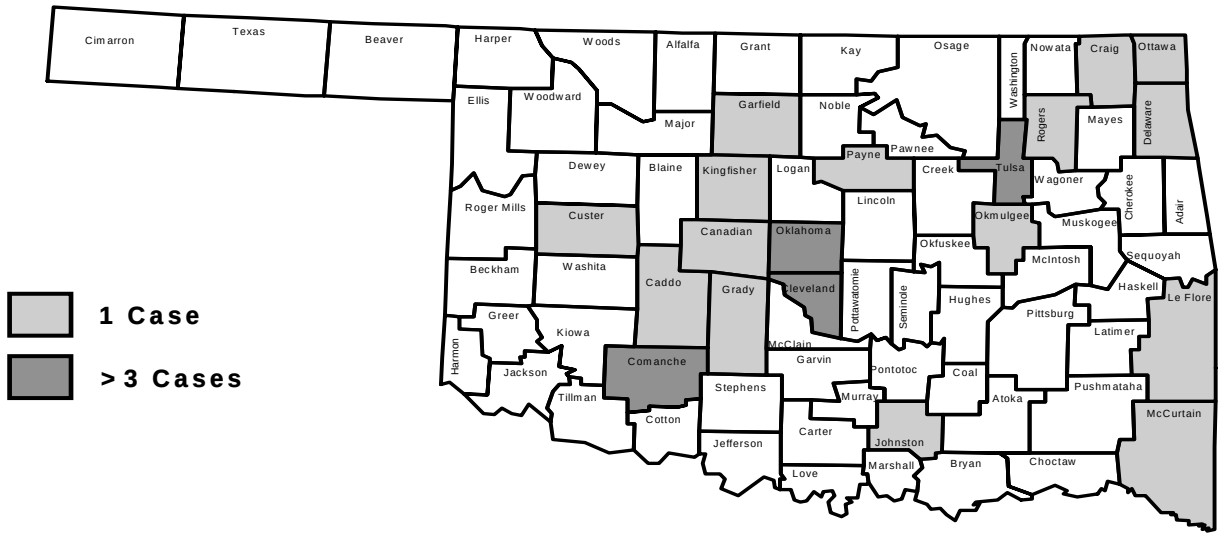
2002 Case Total **56**
Oklahoma Rate 1.62 per 100,000

Invasive Group A *Streptococcus* was added to the reportable disease list in Oklahoma in June of 2000. Invasive group A streptococcal infections may manifest as any of several clinical syndromes, including pneumonia, bacteremia in association with 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. Fifty-six cases (1.62 cases per 100,000) were reported in 2002; an increase from the 49 cases (1.4 cases per 100,000) reported in 2001.

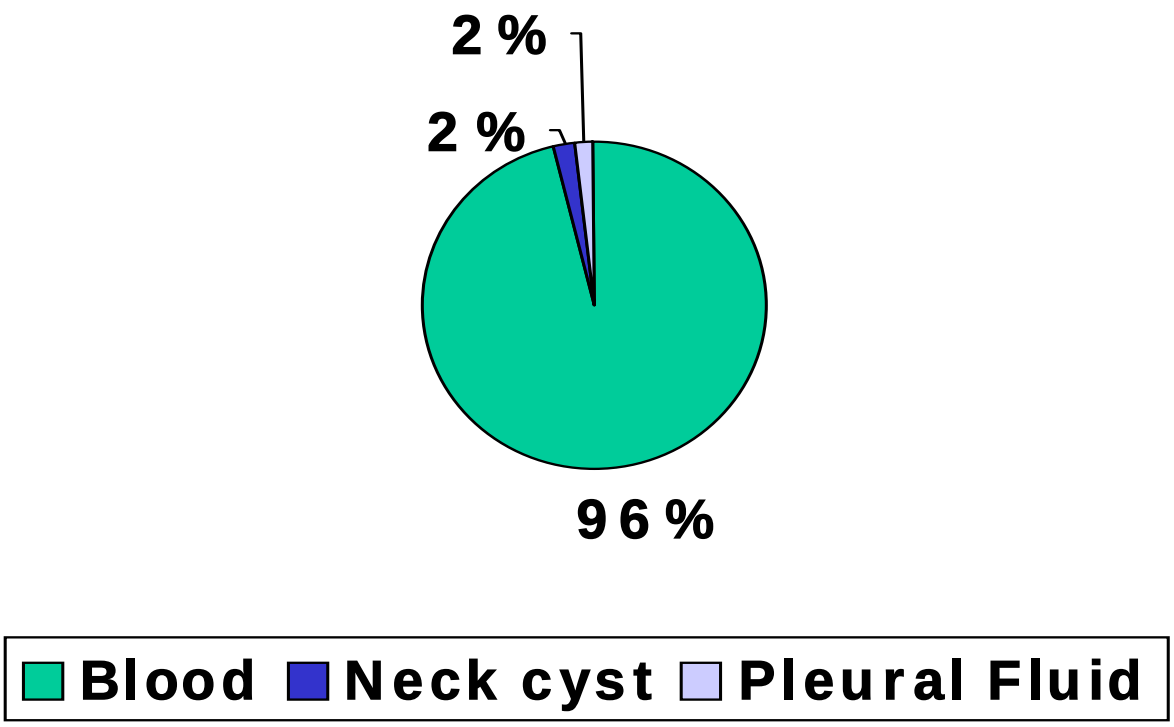
Gender of cases was fairly evenly distributed, with 53.6% of cases occurring in males. The ages of cases ranged from one day to 98 years, with a median age of 56 years. The highest number of cases occurred in whites (69.6%), and the highest rate of disease was among blacks with a rate of 2.3 cases per 100,000 population. The rate of disease among other races were as follows: Asians at 2.1 cases per 100,000, whites at 1.5 cases per 100,000, and American Indians at 1.1 cases per 100,000.

Eighty-nine percent of Group A *Streptococcus* cases were hospitalized. The outcome was known for 45 cases, of which 6 cases (10.7%) died. The cases were widely distributed across the state with the greatest number of cases occurring in Tulsa county (37.5%), Oklahoma county (19.6%), Comanche county (8.9%), and Cleveland county (7.2%). Fifty-four (96.4%) of the specimen sources were blood, and no cases of necrotizing fasciitis were identified during this year.

Invasive Group A *Streptococcus* by County, Oklahoma, 2002



Percentage of Reported Invasive Group A Strep Cases by Specimen Source, 2002



Invasive *Streptococcus pneumoniae*

2002 Case Total **500**
Oklahoma Rate 14.49 per 100,000

In June of 2000, invasive *Streptococcus pneumoniae* was added to the reportable disease list in Oklahoma. *S. pneumoniae* causes many clinical syndromes, depending on the site of infection (e.g., acute otitis media, pneumonia, bacteremia, or meningitis). All *S. pneumoniae* isolated from a normally sterile site (e.g., blood, cerebrospinal fluid, or, less commonly, joint, pleural, or pericardial fluid) are reported in this category. Five hundred cases of Invasive *Streptococcus pneumoniae* were reported in 2002; this was a 20% increase in cases from the 414 cases reported in 2001.

Cases by gender were evenly distributed with 50.4% of cases occurring in females. The ages of cases ranged from 2 days to 103 years with a median age of 61 years. The highest number of reported cases occurred in whites (76.2%) while the highest rate of disease was among blacks at 19.5 cases per 100,000. The incidence rate of disease among other races were as follows: whites at 14.5 per 100,000, American Indians at 10.3 per 100,000, and Asians at 4.3 per 100,000. Cases were widely distributed across the state with a larger portion of the cases occurring in the counties of Tulsa (27.2%) and Oklahoma (22.4%). Cleveland (5.6%), and Pottawatomie (3.2%) followed. Four hundred and eighty-three (96.6%) cases were confirmed by blood culture.

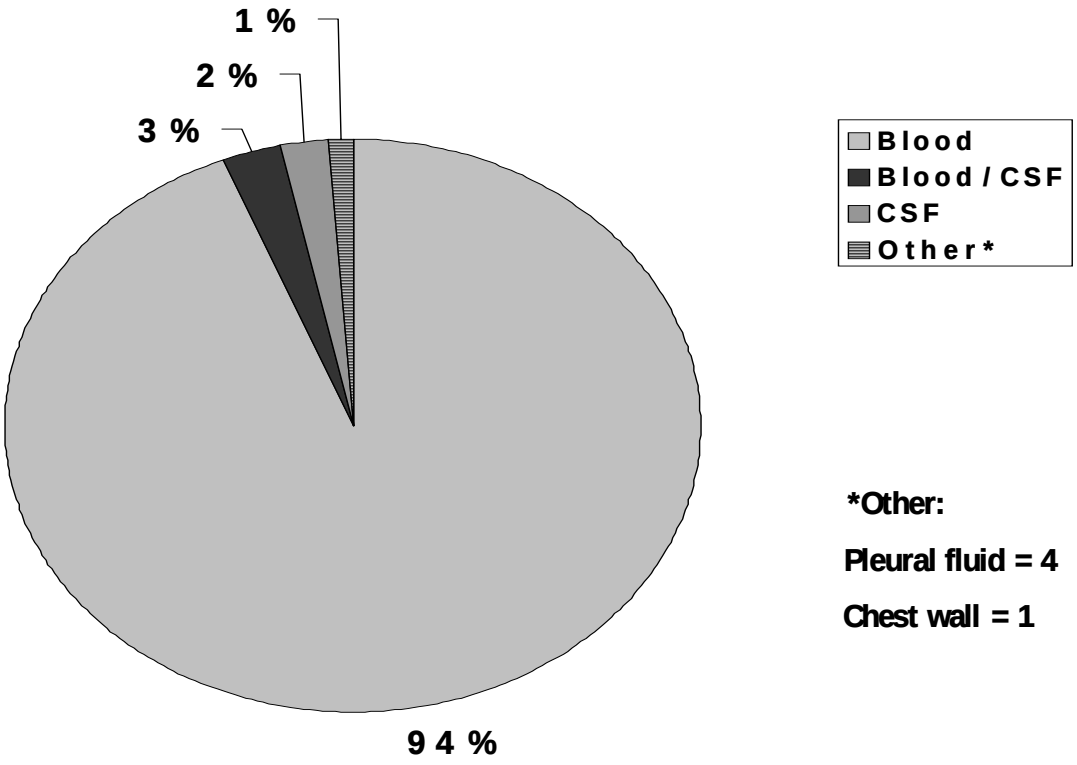
Four hundred fifty cases (90%) were hospitalized. Of the 482 cases for which an outcome was known, sixty-five (13%) died. Two hundred and four (41%) cases and 37 (57%) deaths occurred in persons who were over 65 years of age. The pneumococcal polysaccharide vaccine is recommended for that age group, therefore these cases and deaths are considered preventable.

The Advisory Committee on Immunization Practices (ACIP) recommends the pneumococcal polysaccharide vaccine for all persons in the following groups: a) persons aged $\geq$ 65 years, b) immunocompetent persons aged $\geq$ 2 years who are at increased risk for illness and death associated with pneumococcal disease because of chronic illness, c) persons aged $\geq$ 2 years with functional or anatomic asplenia, d) persons aged $\geq$ 2 years living in environments in which the risk for disease is high, and e) immunocompromised persons aged $\geq$ 2 years who are at high risk for infection.

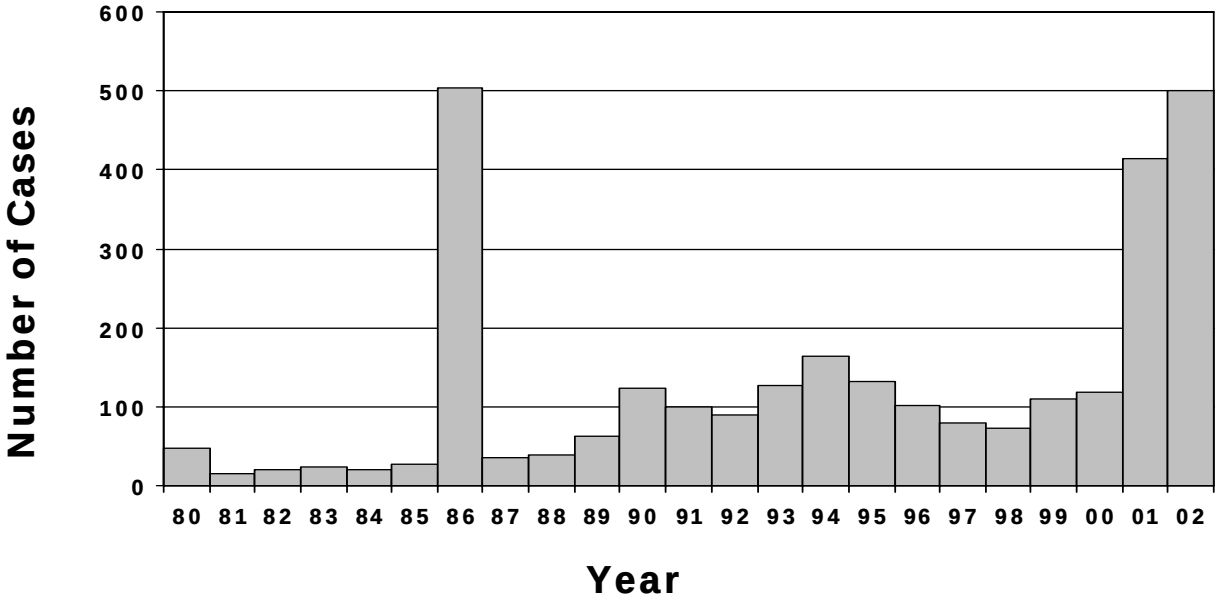
- - - - - - - - - - - - - - - -

CDC, Prevention of Pneumococcal Disease: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1997;46

Percentage of Reported Invasive *S. pneumo* Cases by Specimen Source, Oklahoma, 2002



Number of Cases of Invasive *S. pneumoniae* by Year, Oklahoma, 1980-2002



Meningococcal disease (*Neisseria meningitidis* invasive disease)

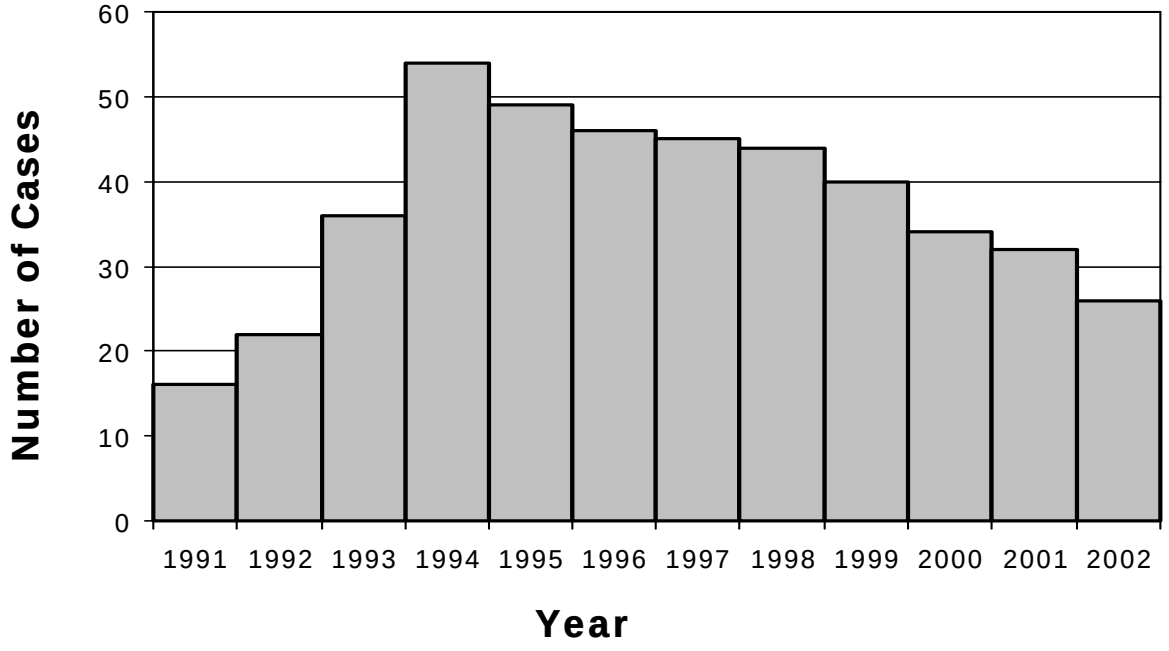
2002 Case Total **26**
Oklahoma Rate 0.75 per 100,000

A total of 26 cases of invasive *Neisseria meningitidis* was reported in 2002, representing a continued decline in the incidence of this disease in Oklahoma. There were 32 cases reported in 2001 and 34 cases reported in 2000 whereas the preceding five-year average number of cases (1995 through 1999) was 45. The incidence of *Neisseria meningitidis* invasive disease in Oklahoma in 2002 was 0.75 cases per 100,000 population.

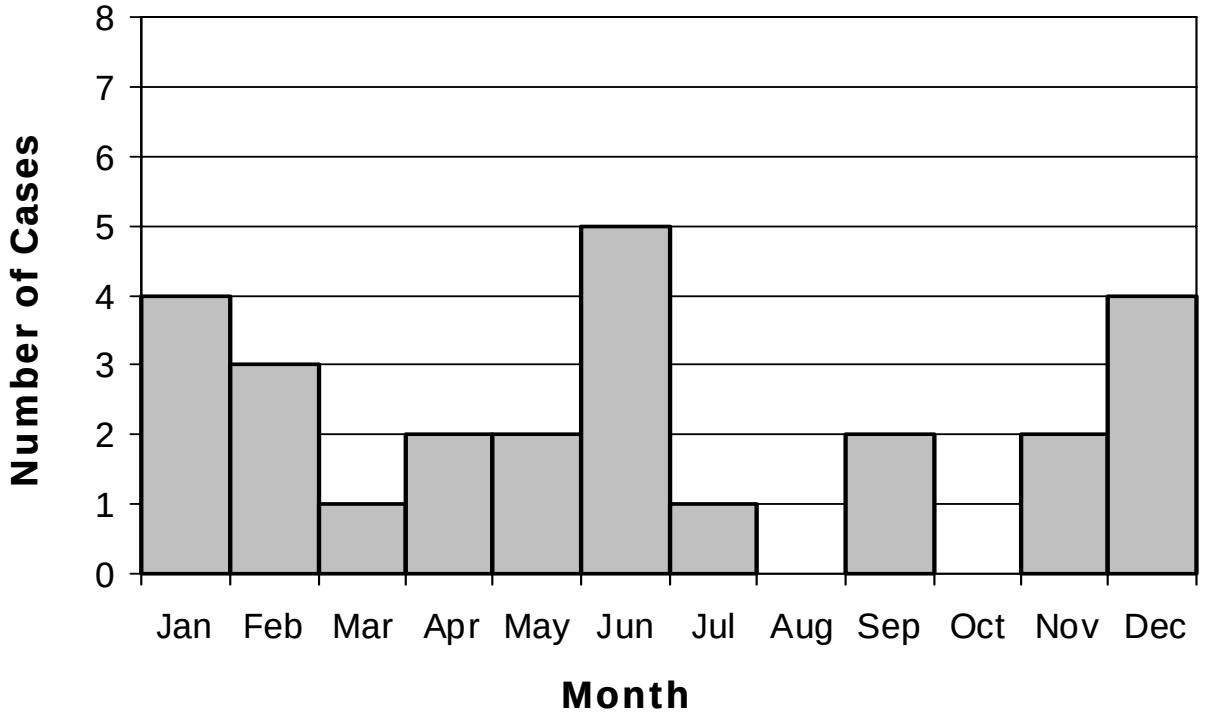
Laboratories in Oklahoma are required to submit sterile-site isolates of *N. meningitidis* to the Oklahoma State Department of Health Public Health Laboratory for confirmation and serogroup analysis. In 2002, twenty *N. meningitidis* isolates were available for serogroup testing. One (.05%) isolate was serogroup B, three (15%) were serogroup C, three (15%) were serogroup W-135, two (10%) were serogroup Y, and eleven (55%) were non-groupable.

Ten of the meningococcal disease cases (38.5%) were female. The rate of *N. meningitidis* invasive disease by racial group were similar for whites (N=19) and Native Americans (N=2) at 0.7 per 100,000, but the rate among blacks (N=4) was 1.5 per 100,000. Age-specific rates of meningococcal disease revealed the highest rates of disease occurred among infants and young children; the rate of disease among infants less than 1 year-old was 2.1 per 100,000 and 2.5 per 100,000 among children less than 10 years-old. Two cases died for an overall case fatality rate of 7.7%.

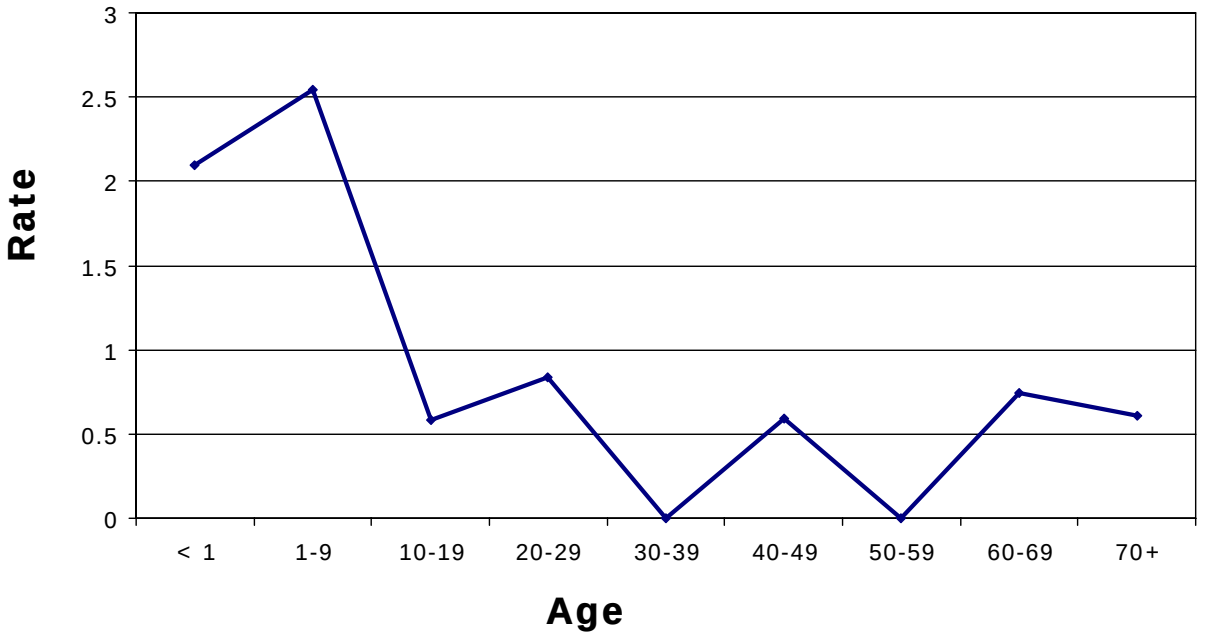
Cases of *N. meningitidis* Invasive Disease by Year, Oklahoma, 1991-2002



Cases of Invasive *N. meningitidis* by Month of Onset, Oklahoma, 2002



Rate of *N. meningitidis* Invasive Disease by Age, Oklahoma, 2002



Listeriosis

2002 Case Total **9**
Oklahoma Rate 0.26 per 100,000

Listeriosis is an uncommon but serious infection caused by the bacteria *Listeria monocytogenes*. Although it only produces approximately 2,500 of the estimated 76 million foodborne illnesses each year in the United States, the burden of invasive infections and deaths as a result of listeriosis are an important public health problem. A review of 1996 through 1998 data from FoodNet* sites found that invasive cases accounted for 93% of reported *Listeria* infections, and these resulted in a case-fatality rate of 48%.

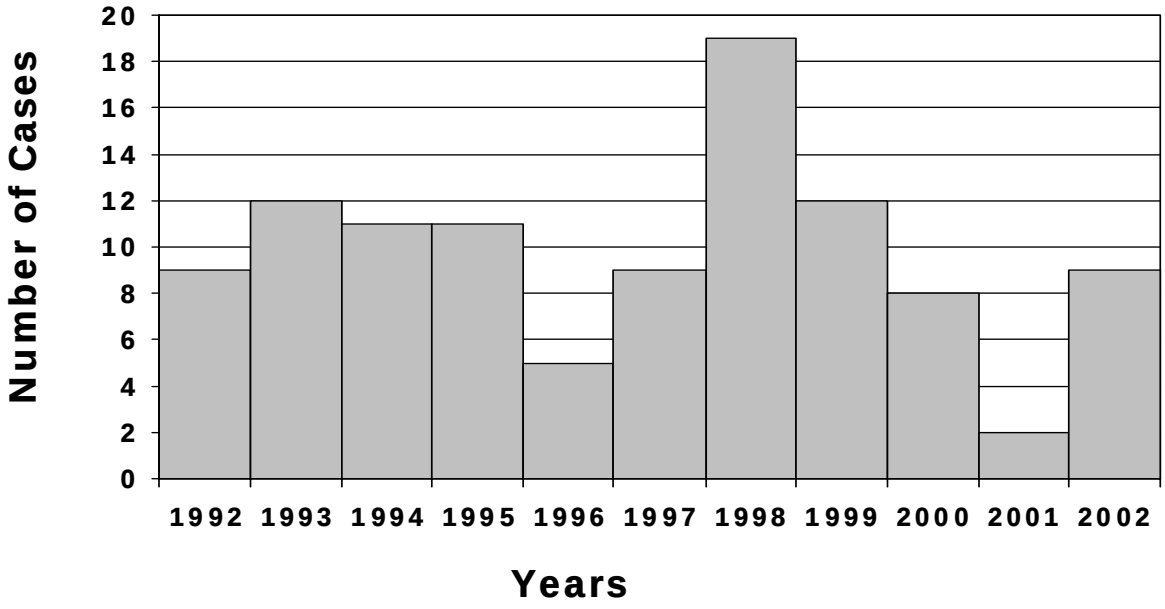
Pregnant women are approximately 20 times more likely than healthy adults to develop listeriosis. Approximately one-third of cases occur among this group. Listeriosis is a special concern for pregnant women; the infection can be passed to the fetus, and in some cases, cause premature delivery, infection of the newborn, or stillbirth. Newborns rather than the mothers suffer the serious effects of infection during pregnancy; the case-fatality rate is 20% in infants born alive, and the occurrence of abortion and stillbirth increases the overall mortality rate to more than 50%. Other specific groups at increased risk include persons infected with HIV, cancer, liver disease, or diabetes, those who take glucocorticosteroid medications, and the elderly. Healthy adults and children rarely become seriously ill from listeriosis.

In Oklahoma, listeriosis became a reportable disease in 2000; 8 cases were reported that year. In 2002, 9 cases were reported in Oklahoma; this was a 78% increase compared to the 2 cases reported in 2001. Cases in 2002 ranged in age from 26 days to 94 years and had a median age of ??. Eight (89%) cases were over 40 years of age. One case (11%) died due to listeriosis. About two-thirds of the cases (66.7%) resided in Oklahoma county. Incidence rates for Oklahoma in 2000, 2001, and 2002 were 0.23, 0.05, and 0.26 per 100,000 respectively; incidence rates were lower compared to incidence rates for FoodNet sites at 0.34 per 100,000, 0.27 per 100,000, and 0.31 per 100,000 FoodNet population. FoodNet data collected from active surveillance sites indicate the incidence of *Listeria* infections has decreased nationally over the past several years. With the exception of 1998, incidence rates have continued to be lower in Oklahoma when compared to the incidence of listeriosis among FoodNet sites. Most cases of listeriosis are sporadic, however, outbreaks due to consumption of contaminated food have occurred. In 1998, a multistate outbreak of listeriosis resulted from post-processing contamination of deli meats. Prompt reporting of cases can help in the early detection of an outbreak, identify the sources of infection, and prevent additional cases. The Communicable Disease Reporting Rules (OAC 310: Chapter 515) require that *Listeria* isolates grown from sterile sites (e.g. blood and cerebrospinal fluid) be sent to the OSDH Public Health Laboratory for confirmation and identification.

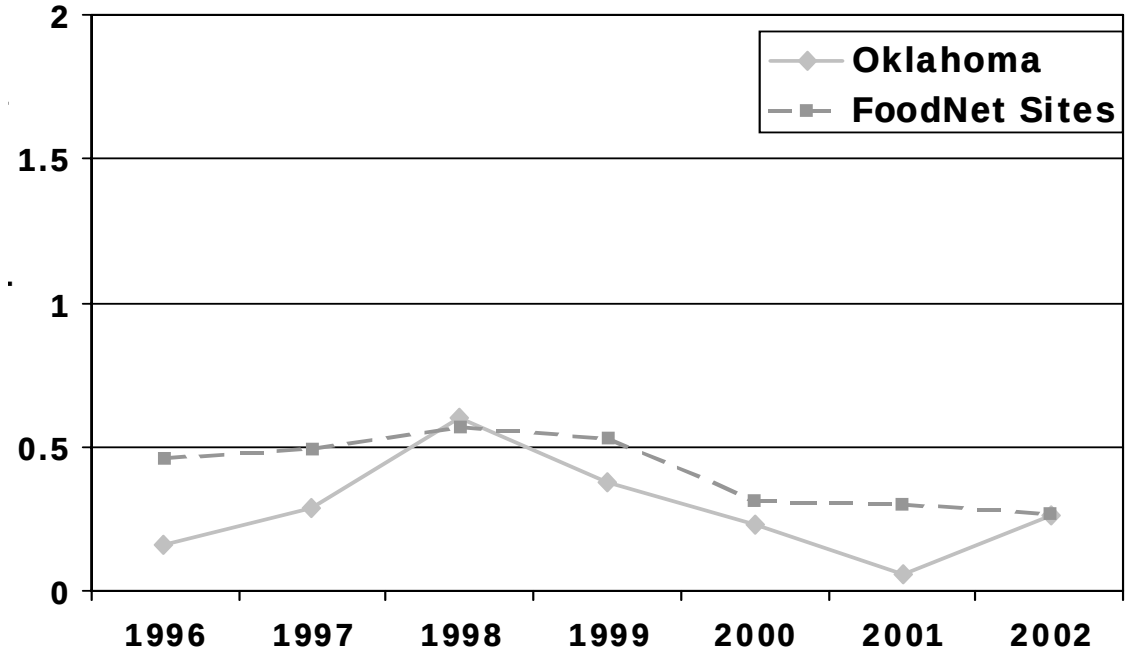
*****The Foodborne Diseases Active Surveillance Network (FoodNet) is the principal foodborne disease component of CDC's Emerging Infections Program (EIP). FoodNet is a collaborative project of the CDC, ten EIP sites (California, Colorado, Connecticut, Georgia, New York, Maryland, Minnesota, Oregon, Tennessee and New Mexico), the U.S. Department of Agriculture (USDA), and the Food and Drug Administration (FDA).

Listeriosis Data

Number of cases of Listeriosis by year, Oklahoma, 1992 - 2002



Listeriosis Incidence Rate by Year, Oklahoma and U.S., 1997-2002



Sexually Transmitted Infections

AIDS and HIV Infections

In 1983, AIDS became a reportable condition in Oklahoma. All states and territories now have HIV infection reporting or have it targeted dates to begin. Reporting requirements vary from requiring name to numerous methods to create unique identifier codes. In 1988, HIV became a reportable condition by name in Oklahoma.

As of December 31, 2002, 2,591 HIV and 4,098 AIDS case have been reported in Oklahoma. Of these, 2,451 (37%) are known to have died. As seen nationally, Oklahoma death rates have dropped significantly since 1994. This decrease is attributable to better medical management of HIV and Highly Active Anti-Retroviral Treatment (HAART) medications. Counting both in-state and out-of-state HIV cases residing in Oklahoma, there are 5,019 persons known to be living in Oklahoma. The Oklahoma prevalence rate is 145 cases per 100,000 persons. This compares to the national rate of 166 cases per 100,000.

The predominant mode of transmission and race for Oklahoma AIDS and HIV cases has been white males who have sex with males (MSM) with a cumulative percent of 54 and 69 respectively. This mode of transmission has been decreasing over time and reflected only 48 percent of the cases in 2001. Although many more Whites have been reported than any other race/ethnicity population, Blacks have experienced the greatest impact with approximately 5 times the rate per 100,000 population as the Whites for HIV infection. The majority of HIV and AIDS cases are reported as living in the two biggest urban areas of Oklahoma at time of initial test positive. This residence trend for HIV infected persons remains stable and increases over time due to the lack of access to quality medical care in rural Oklahoma

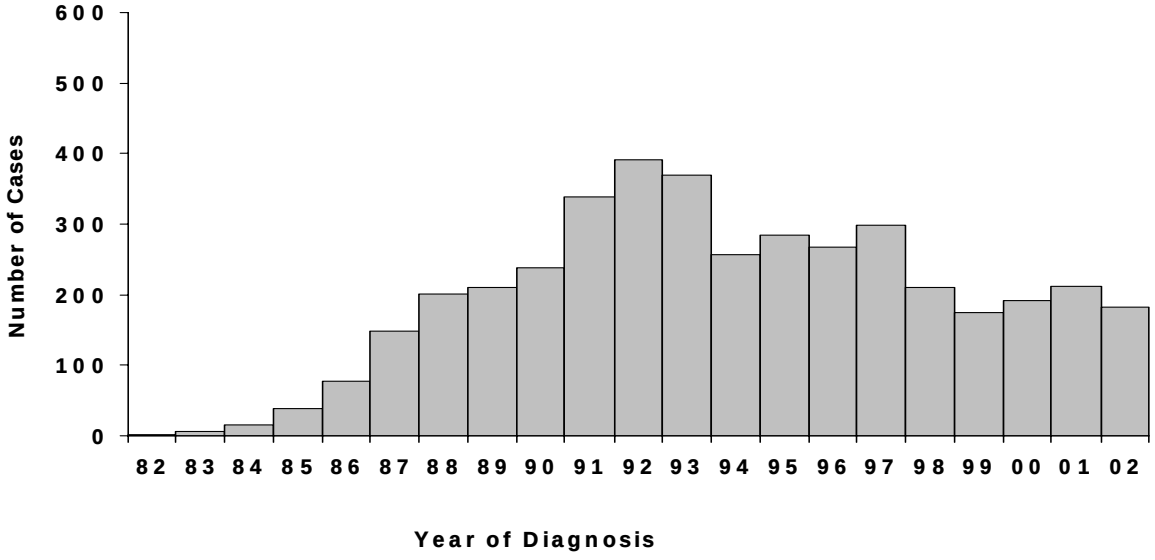
The number of AIDS diagnoses dropped considerably in 1994. This decrease is an artifact of the AIDS surveillance case definition change for adults and adolescents in 1993 and HIV surveillance efforts since 1988. In short, the OSDH was able to attribute 426 AIDS cases to previous diagnosis years on January 1, 1993, thereby reducing the number of cases for subsequent years. Due to reporting lag time, data through 2001 should be considered complete.

HIV (not AIDS) Cases by Year of 1st Seropositive Test

Race / Ethnicity	Males				Females			
	2001		2002		2001		2002	
	#	Rate	#	Rate	#	Rate	#	Rate
White	61	4.9	92	7.3	21	1.6	22	1.7
Black	28	24.6	36	31.7	9	7.5	11	9.2
Other (Unknown or Multiracial)	8	N/A*	7	N/A*	5	N/A*	2	N/A*
American Indian	11	8.9	8	6.5	3	2.3	2	1.5
Asian / Pacific Islander	1	6.1	1	6.1	0	-	0	-
Total	109	7.1	144	9.4	39	2.4	37	2.3

N/A* Cannot calculate with 2000 Census numbers. HIV data collected with Hispanic as Race, Census data collected with Hispanic as Ethnicity.

Cases of AIDS by Year of Diagnosis, Oklahoma, 1982- 2002



HIV Cases by Year of Diagnosis

	Number of HIV Cases Diagnosed			Annual Rate per 100,000		
Region of State	2000	2001	2002	2000	2001	2002
State of Oklahoma	163	140	157	5.2	4.5	5.0
Oklahoma City MSA	69	63	75	6.6	7.8	22
Tulsa MSA	53	55	44	7.8	6.2	11
Northeast	12	7	16	1.4	3.1	2
Northwest	6	1	3	0.5	1.6	2
Southeast	12	6	4	1.6	1.0	0
Southwest	11	8	10	2.1	2.6	37

AIDS Cases by Year of Diagnosis

	Number of AIDS Cases Diagnosed			Annual Rate per 100,000		
Region of State	2000	2001	2002	2000	2001	2002
State of Oklahoma	194	213	183	6.2	6.8	5.8
Oklahoma City MSA	85	110	86	8.9	11.5	9.0
Tulsa MSA	63	57	55	8.9	8.0	7.8
Northeast	16	21	16	3.1	4.1	3.1
Northwest	5	3	2	2.6	1.6	1.0
Southeast	9	14	8	2.4	3.7	2.1
Southwest	16	7	16	4.2	1.8	4.2

Chlamydia

2002 Case Total **10,732**
Oklahoma Rate 298 per 100,000

Chlamydia trachomatis is the most prevalent reportable sexually transmitted infection or general communicable disease in Oklahoma. In women, chlamydia infection can result in pelvic inflammatory disease, ectopic pregnancy, chronic pain, and eventual infertility. In addition, pregnant women infected with chlamydia can also infect their baby during birth, which can lead to blindness. In men, this infection is most often asymptomatic but can cause urethritis and infertility.

Chlamydia became reportable in Oklahoma in 1988. During the first year chlamydia was a notifiable disease, 2,714 cases were reported. Until 1991, the number of infections steadily increased and then declined until 1994. There were three activities initiated in 1994 that dramatically increased the number of identified and reported cases of chlamydia.

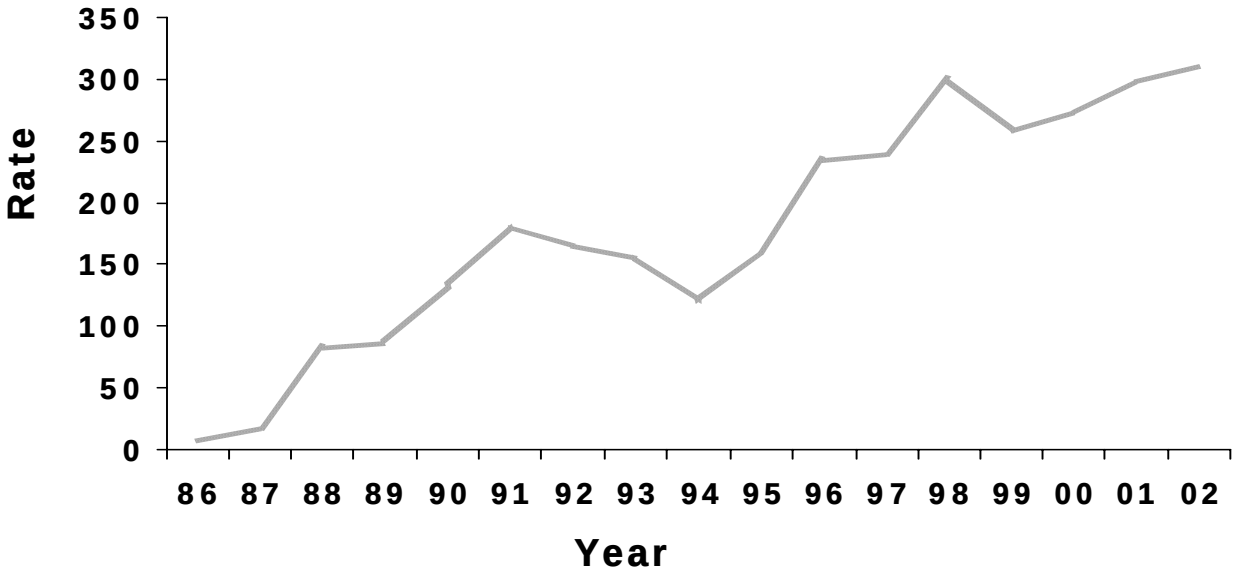
First, a significant increase in state funding was made available to screen for chlamydia in selected county health department STD Family Planning and Maternity Clinics. As a result, 3,784 cases were reported in 1994. As additional funding became available in late 1996, all 69 county health departments were brought on-line to screen for chlamydia. Second, the OSDH Public Health Laboratory began using amplified testing instead of the benchmark culture test. Third, the HIV/STD Service initiated active surveillance for chlamydia. As a result of these activities, the number of cases reported to the OSDH has continued to grow to 10,723 in 2002.

Of the 10,723 cases of chlamydia diagnosed and reported in 2002, 4,352 (40.6%) were identified through the county health department screening program. Of these, 1,190 (27%) were male and 3,162 (73%) were female. The larger infected female population is a direct reflection of screening priorities. Due to funding restrictions, the screening program has been directed in large part to only females. Those males that are reflected are partners of positive females identified through Family Planning and Maternity Clinics and those seen through selected county health department STD Clinics.

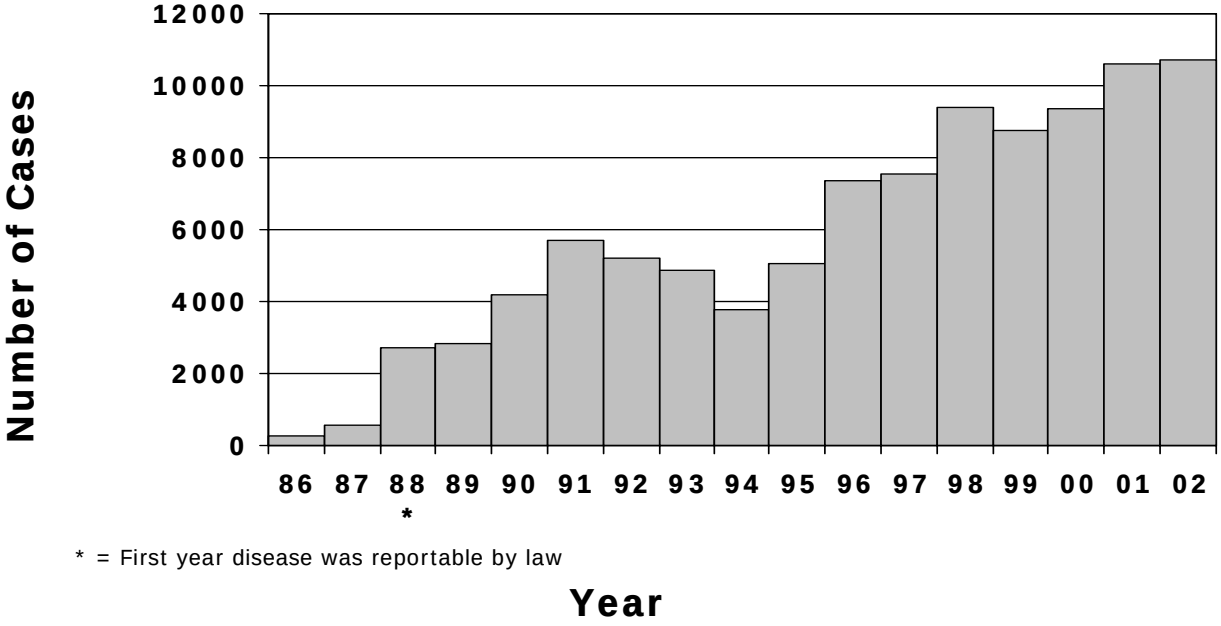
Of the chlamydia cases diagnosed and reported in 2002, 3,734 (35%) were reported in blacks. Analysis of this data shows a rate of 788 per 100,000 in black males compared to 48 per 100,000 in white males and 2,027 per 100, 000 in black females compared to 284 per 100,000 in white females. This racial disparity is also pronounced with analysis of the 15 – 19 year old population. The incidence of chlamydia in this black population is 6,681 per 100,000 as compared to the white population with 1,156 per 100,000. Of the total number of cases of chlamydia diagnosed and reported in 2002, 80% were reported in persons between the ages of 15 and 24 years of age.

Other* *includes Hispanic, Asian/Pacific Islander and Unknown; these racial/ethnic categories have been combined to insure confidentiality since the Hispanic and Asian/PI communities in Oklahoma are relatively small.*

Chlamydia in Oklahoma, 1986-2002, Incidence Rate per 100,000 by Year



Reported Cases of Chlamydia by Year, Oklahoma, 1986-2002



* = First year disease was reportable by law

Gonorrhea

2001 Case Total **4,624**
Oklahoma Rate 134 per 100,000

Gonorrhea is the second most prevalent reportable sexually transmitted infection or general communicable disease in Oklahoma. In women, gonorrhea can result in pelvic inflammatory disease, ectopic pregnancy, cervicitis, and eventual infertility. In addition, pregnant women infected with gonorrhea can also infect their baby through amniotic fluid or during birth. In men, this infection most often results in purulent urethral discharge and dysuria and can cause infertility.

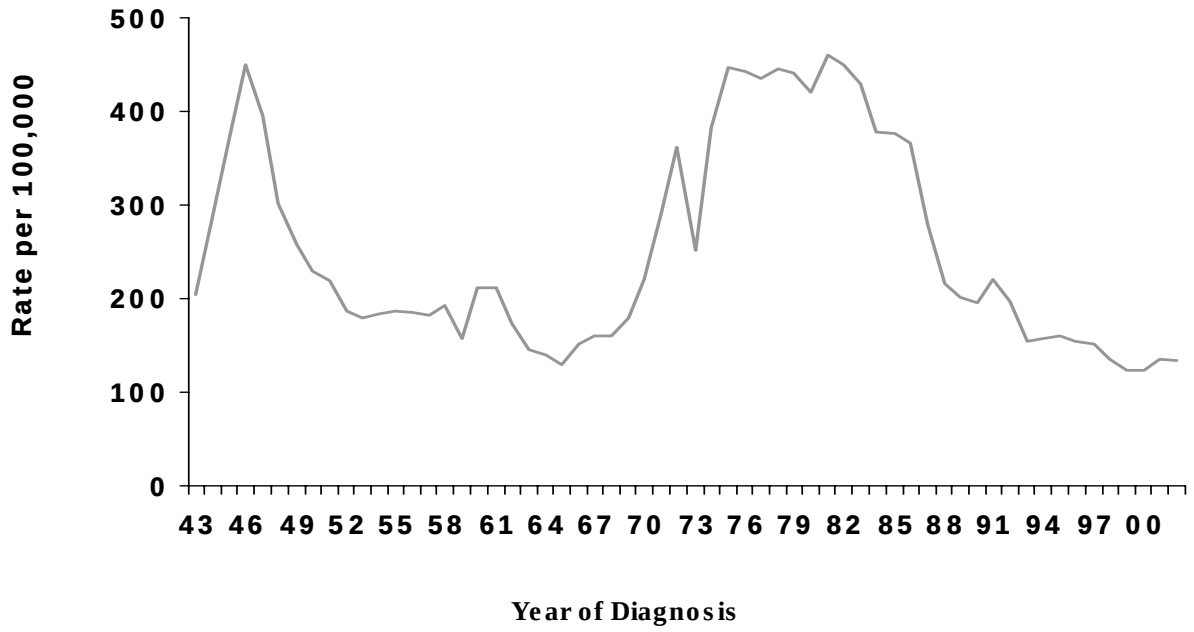
Gonorrhea became reportable in Oklahoma in 1943. During the first year gonorrhea was a notifiable disease, 4,715 cases were reported. Since the all time peak reporting year in 1982 with 14,529 cases, the number reported by year has steadily decreased to 4,624 reported in 2002

In 1994, an increase in state funding made routine screening for gonorrhea using amplified testing available in selected county health department STD Family Planning and Maternity Clinics. As a result 2,624 cases from the county health department system were reported in 1994. When additional funding became available in late 1996, all 69 county health departments were brought on-line to screen for gonorrhea. In year 2002, 2,197 or 48% of the total gonorrhea cases reported to the OSDH were identified by the county health department screening project.

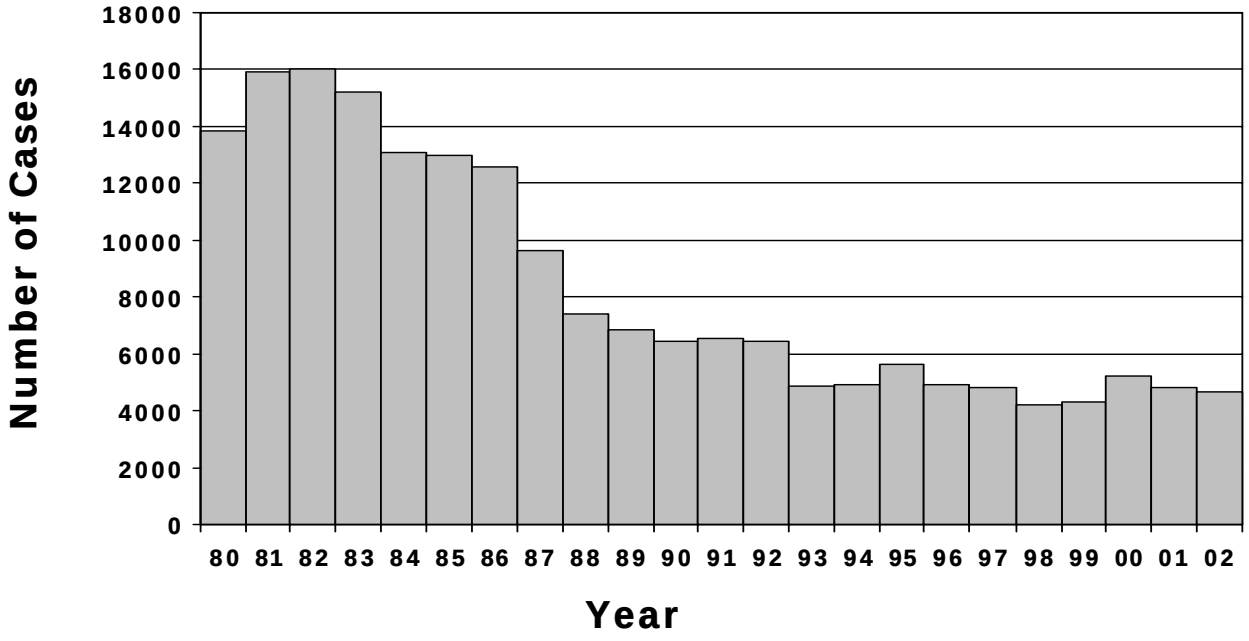
Of the 4,624 cases of gonorrhea diagnosed in 2002, 2,962 (64%) were reported in blacks. Analysis of this data shows a rate of 1,204 per 100,000 in black males compared to 26 per 100,000 in white males and 1,059 per 100,000 in black females compared to 53 per 100,000 in white females. This racial disparity is even more pronounced in the 15 – 19 year old population. The age-specific incidence rate of gonorrhea in this age group in the black population is 4,052 per 100,000 as compared to the white population with 187 per 100,000. Of the total number of gonorrhea cases diagnosed in 2002, 66% were reported in persons between the ages of 15 and 24 years of age.

Other* *includes Hispanic, Asian/Pacific Islander and Unknown; these racial/ethnic categories have been combined to insure confidentiality since the Hispanic and Asian/PI communities in Oklahoma are relatively small.*

Gonorrhea in Oklahoma, 1943 – 2000, Incidence Rate per 100,000 by Year



Cases of Gonorrhea by Year, Oklahoma, 1980-2002



Total Early Syphilis

2002 Case Total **183**
Oklahoma Rate 530 per 100,000

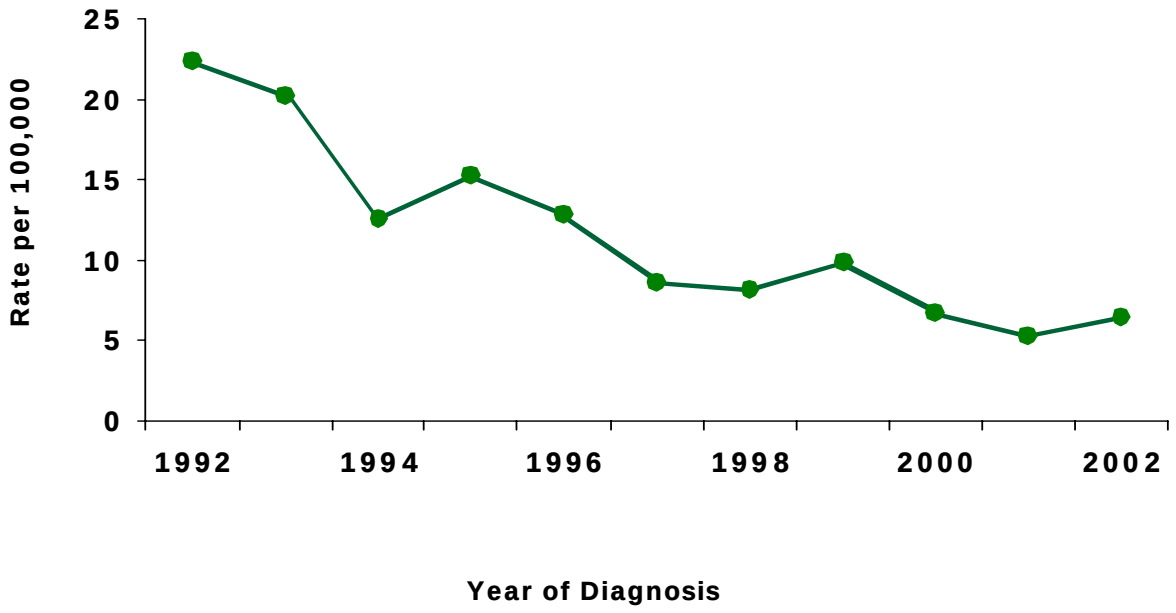
Most cases of syphilis in Oklahoma occur in our major population areas, primarily the Oklahoma City metropolitan statistical area (MSA). In 1998, Oklahoma County became one of 28 high morbidity areas (HMA) for syphilis in the United States. These 28 counties were targeted as the spearhead in a syphilis elimination campaign because they collectively accounted for over 50% of all syphilis cases diagnosed and reported in the US in 1997.

To eliminate syphilis in the United States, the Centers for Disease Control and Prevention set the Health People 2010 prevalence goal to 0.4 per 100,00 population. In year 2002, Oklahoma City ranked 6th and Oklahoma ranked 17th in the nation. These rankings correspond with rates of 12.5, and 2.1 per 100,000 population. These rates clearly demonstrate Oklahoma City is the driving force of syphilis in Oklahoma.

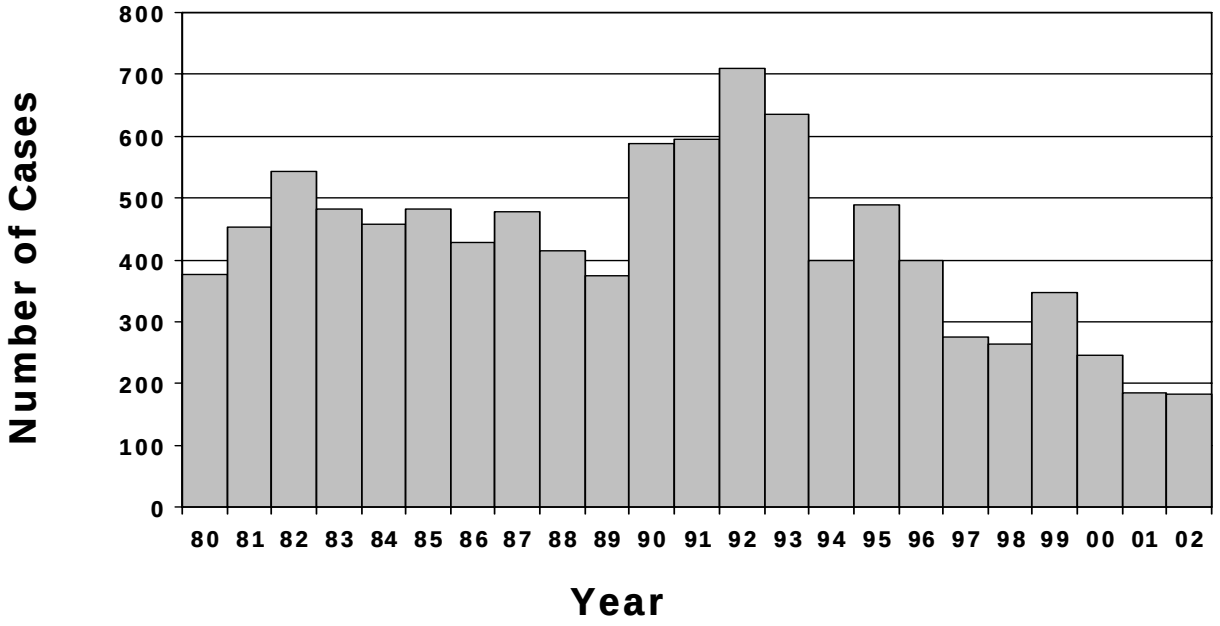
Reported rates of primary and secondary syphilis declined by nearly half from 1990 through 1993. Reported syphilis rates were highest among blacks and lowest among whites and Asian/Pacific Islanders. Although numbers continue to decline through 2002, reported rates in blacks are still the highest and whites are the lowest.

Other* *includes Hispanic, Asian/Pacific Islander and Unknown; these racial/ethnic categories have been combined to insure confidentiality since the Hispanic and Asian/PI communities in Oklahoma are relatively small.*

Total Early Syphilis, 1992 – 2002, Incidence Rate per 100,000 by Year



Cases of Syphillis (Total Early) by Year, Oklahoma, 1980-2002



Vectorborne Diseases

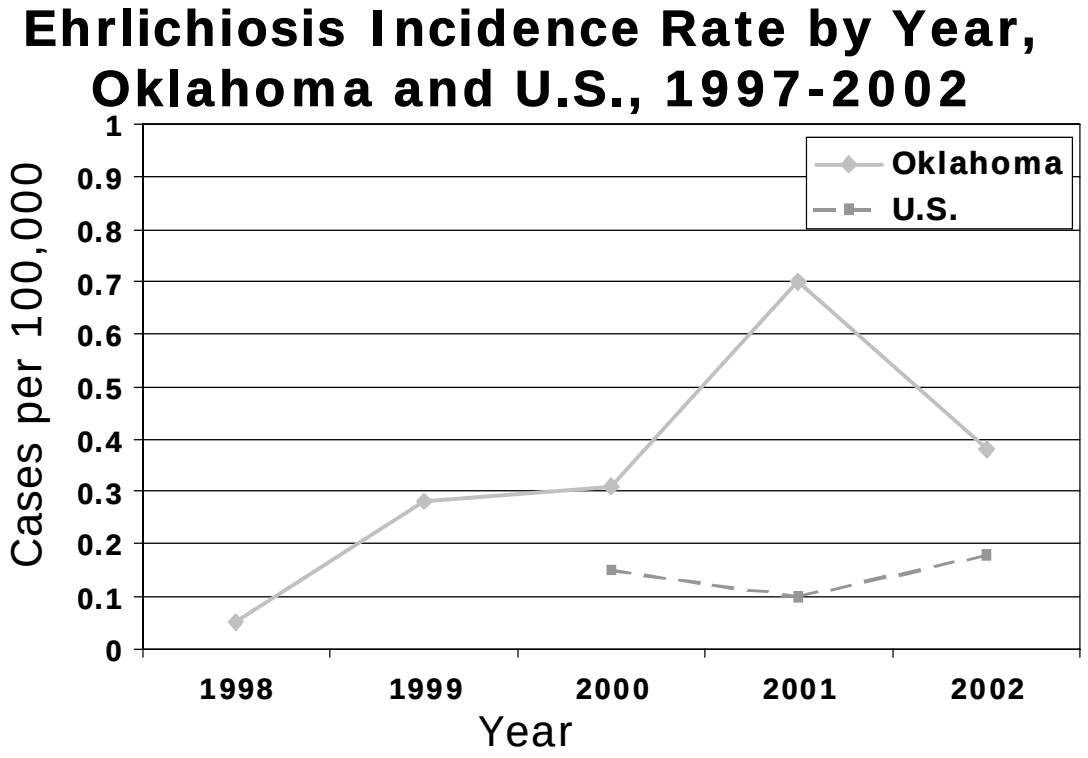
Ehrlichiosis (HME)

2002 Case Count 13
Oklahoma Rate 0.38 Per 100,000

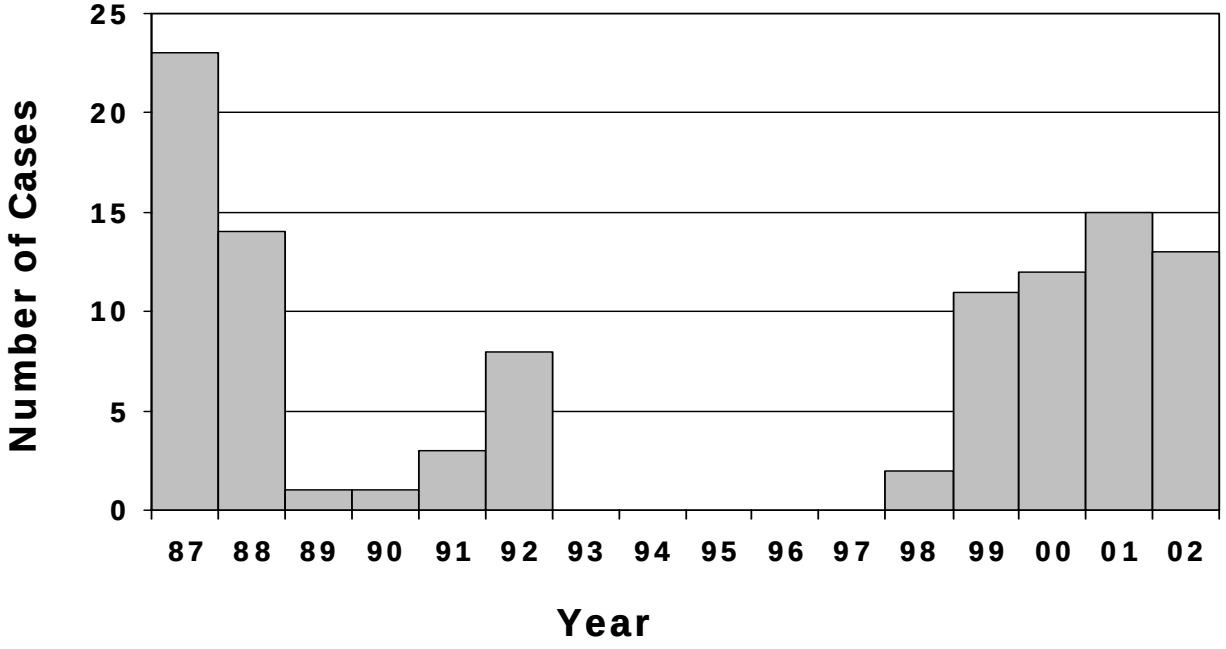
Ehrlichia was first recognized as a human pathogen in the US in 1987. In Oklahoma, *Ehrlichia* is an emerging zoonotic pathogen with the first cases being reported in 1998. There were 13 reported cases of ehrlichiosis (HME) in Oklahoma in 2002. Cases were reported among residents of 12 (15%) of 77 counties; Tulsa, Rogers, McClain, Cherokee, Oklahoma, Mayes, Washington, Lincoln, Pawnee, Canadian, Pushmataha and Adair counties. Cases were reported between the months of May through August, which coincides with the active feeding period of the adult tick.

In 2002, Ehrlichiosis cases ranged in age from 15 to 77 years-old with a median age of 40. Eleven (85%) cases were male and 2 (15%) were female. Symptoms of reported cases included fever (100%), headache (77%), myalgia (54%), and rash (08%). Seven (54%) cases were hospitalized. None of the cases reported in 2002 died due to Ehrlichiosis.

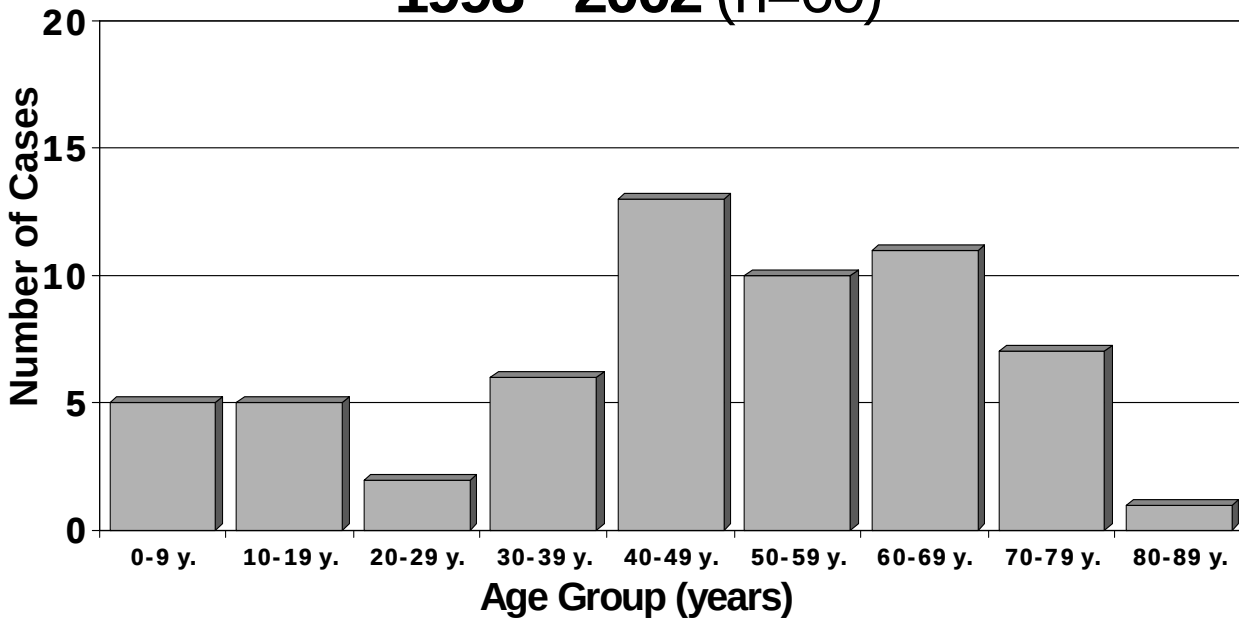
The white tailed deer is a natural reservoir for *Ehrlichia chafeensis* in Oklahoma; tick vectors are the lone star tick and the American dog tick. Ten cases (77%) reported exposure to a wooded or tick-infested area during the month prior to illness onset and fifty-four percent of cases reported a tick bite during the 14 days prior to onset of symptoms. Epidemiologic information collecting from investigations of reported cases underscores the importance of practicing tick bite prevention activities.



Cases of Ehrlichiosis (HME) by Year, Oklahoma, 1987-2002



Reported Ehrlichiosis Cases by 10-Year Age Groups, Oklahoma, 1998 - 2002 (n=60)



Lyme Disease

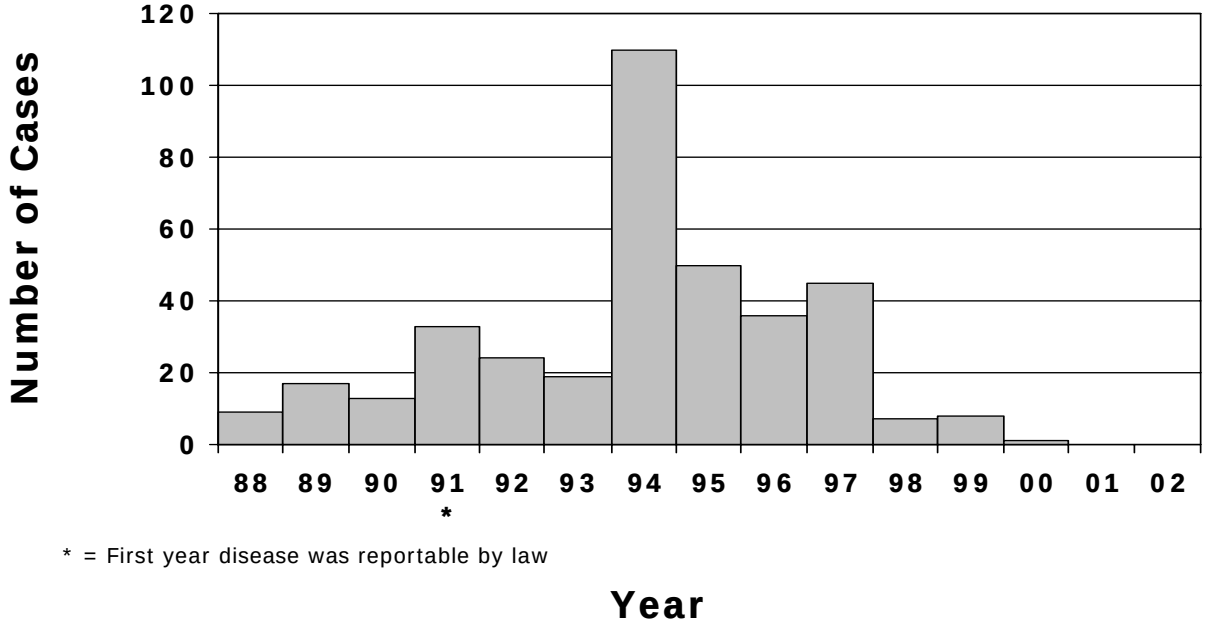
2002 Case Total 0

Positive laboratory tests for Lyme disease are reported to the Communicable Disease Division each year for investigation, however, no cases of Lyme disease meeting the Centers for Disease Control and Prevention (CDC) surveillance case definition were reported in 2002. A total of 317 cases of Lyme disease meeting the case definition were reported from 1992 through 2002. The mean age was 39.8 years and ranged from 1 to 91 years. Fifty- seven percent of reported cases were female. Information regarding the presence of an erythema migrans (EM) rash of at least 5 cm in diameter was recorded for 245 (77%) cases. Thirty-five percent of cases in Oklahoma reported the presence of an EM rash compared to 80 to 90% of confirmed cases from endemic areas located in the Eastern U.S.

Through the 1990s, the CDC surveillance case definition for Lyme disease was revised as more sensitive and specific laboratory tests were developed. Subsequent reductions in the number of reported cases reflect this. The two-test approach using a sensitive enzyme immunoassay (EIA) or immunofluorescence antibody (IFA) test followed by the more specific Western blot test has reduced reporting of cases with false positive laboratory results. A confirmed case must now include a positive Western blot test.

The issue regarding the presence of “true” Lyme disease in Oklahoma and other southern states is controversial. Oklahoma is home to many of the factors necessary for locally acquired Lyme disease. However, *B. burgdorferi* has never been isolated from a human with a locally acquired case of Lyme disease. *B. burgdorferi* can be cultured from over 80% of biopsy specimens taken from an early stage EM rash in geographic areas where Lyme disease is endemic.

Cases of Lyme Disease by Year, Oklahoma, 1988-2002



* = First year disease was reportable by law

Rocky Mountain Spotted Fever

2002 Case Total 111
Oklahoma Rate 3.2 per 100,000

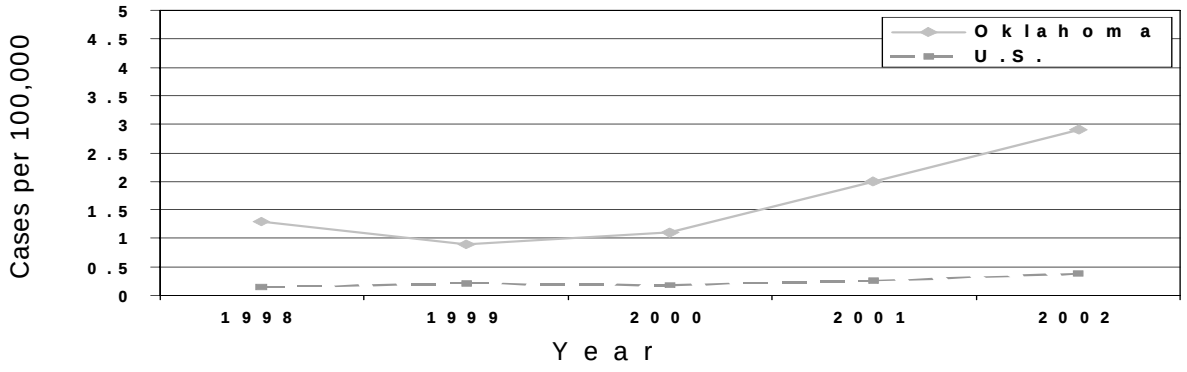
Rocky Mountain Spotted Fever (RMSF) is a prevalent tickborne disease in Oklahoma, especially in the eastern parts of the state. Incidence Rates of RMSF in Oklahoma have consistently ranked in the top 5 of reported cases in the United States. The American dog tick (*D. variabilis*) is the only proven vector of RMSF (*Rickettsia rickettsii*) for humans in Oklahoma. Cases of RMSF occur throughout the year, but the majority of cases occur between the months of April and September, which coincides with the time that the adult American dog tick is most actively feeding. There were 111 reported cases of RMSF throughout the state. Counties with the highest incidence of cases were Leflore county, Lincoln county, Mayes county, Delaware county, Cherokee county, Cleveland county, and Creek county.

Fifty-seven percent of RMSF cases were males and forty-one percent were females. Most of the reported cases were white (77%), followed by Native Americans (12%). Seventy-one percent of cases were 26 years old and over. The ages ranged from 3 to 86 years old with a median age of 39 years. Infants and young children less than 10 years of age had the highest incidence rate among males (1.88 per 100,000) where as adults 40-49 years (2.48 per 100,000) and 60-69 (2.5 per 100,000) accounted for the highest incidence rates among females.

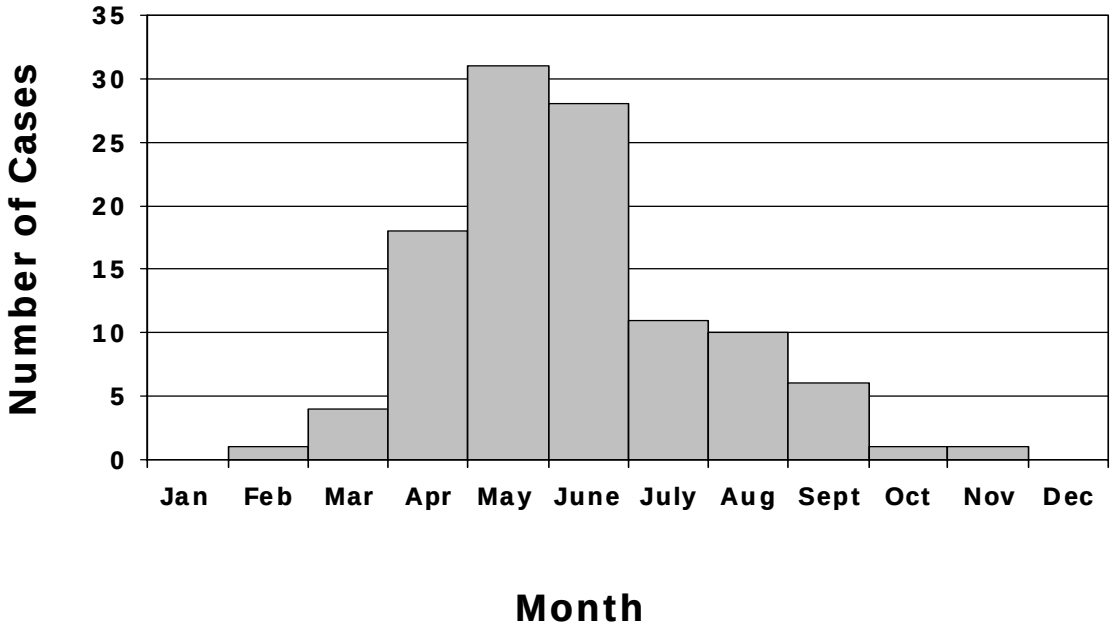
The most common symptoms reported were fever (92%), headache (77%), myalgia (66%), and rash (43%). Twenty-four (22%) of the cases were hospitalized, and there were no reported deaths. Eighty-seven (78%) of the cases reported tick exposure, and eighty-one (73%) reported having tick attachment during the 2 weeks prior to illness onset.

Patients who have symptoms compatible with RMSF will often present with fever, headache, myalgia, and a rash on the palms of the hands and soles of the feet. Rash is not always present in patients diagnosed with RMSF. Diagnosis of RMSF is confirmed by noting a four-fold rise in antibody titers to specific antigens in acute and convalescent sera drawn at least four weeks apart. A single specimen is generally not diagnostic of acute infection since it may indicate past exposure. RMSF testing may be obtained from laboratories throughout the state as well as the OSDH public health lab.

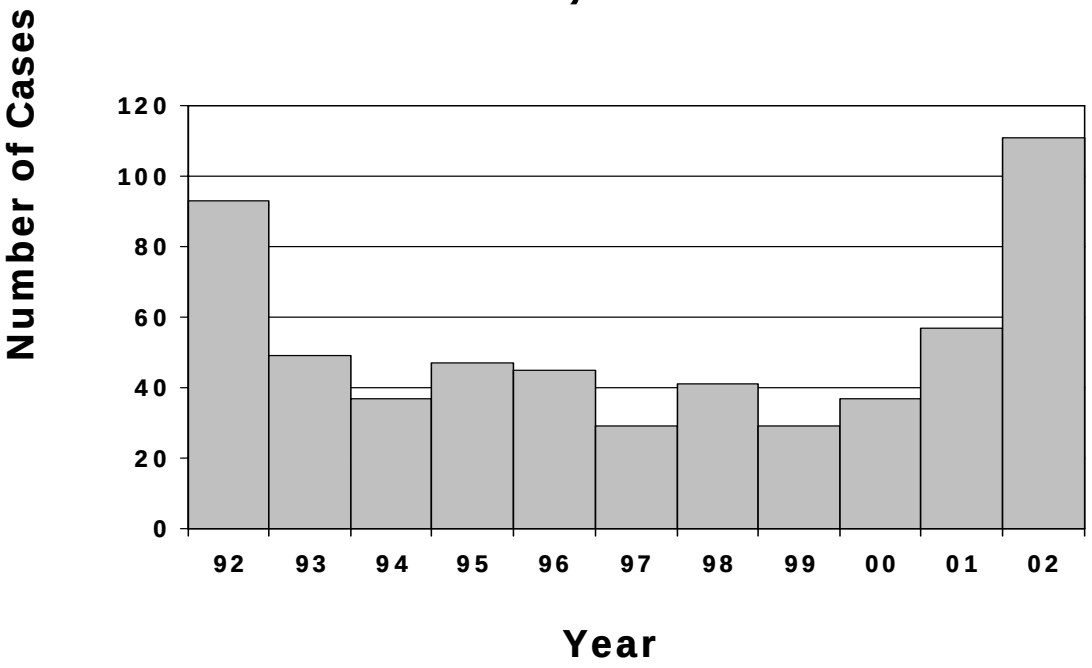
Rocky Mountain Spotted Fever Incidence Rate by Year, Oklahoma and U.S., 1997-2002



Reported Cases of RMSF by Month, Okalahoma, 2002



Reported cases of RMSF by Year, Oklahoma, 1992-2002



Tularemia

2002 Case Total 10
Oklahoma Rate .29 per 100,000

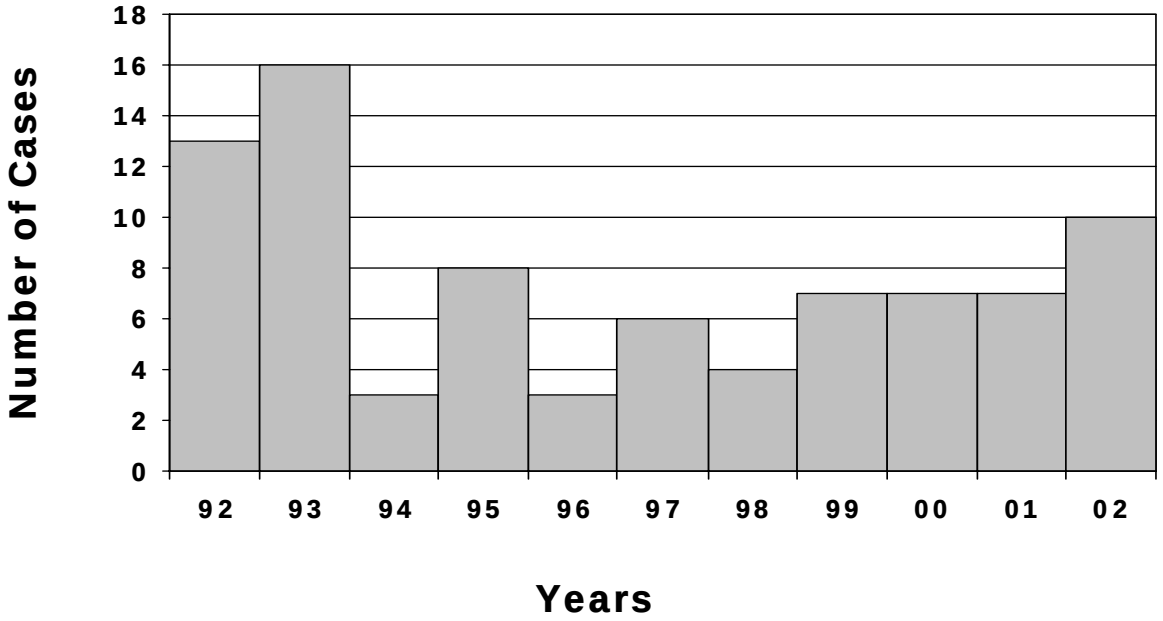
Tularemia is a zoonotic bacterial disease caused by *Francissella tularensis.* In 2002, 10 cases of tularemia were reported in Oklahoma. Cases were reported among residents of Washington county, Creek county, Tulsa county, Nowata county, Okfuskee county, Comanche county, and Okmulgee county. Cases were reported between the months of May and December. All ten cases were male. The majority of cases (60%) were white. Cases ranged in age from 7 years to 69 years old with a median age of 58 years. One case was hospitalized and no deaths were reported in 2002. The most common reported symptoms from Tularemia cases were nausea and vomiting (50%), fever (40%), chills (40%), and abdominal pain (30%). Sixty percent of cases were identified by *Francisella tularensis* isolated from a blood specimen. The most common exposure reported by cases was a tick bite during the 2 weeks prior to illness onset (40%).

Reservoirs are numerous wild animals such as rabbits, hares, voles ect. Various hard ticks, and some domestic animals may also be infected. The most common route of transmission in Oklahoma is the bite of an infected tick. The American dog tick and the lone star tick both have been implicated in the transmission of tularemia. Exposure can also occur from contact of the skin or mucous membranes with the blood or tissue of an infected animal or handling or eating insufficiently cooked rabbit meat. Oklahoma has traditionally been ranked among the highest states in the nation in the number of reported tularemia cases. As with most tickborne illnesses such as Rocky Mountain Spotted Fever and Ehrlichiosis, reported cases of tularemia are usually between April and September, which coincides with the period of active feeding of adult ticks. Tick prevalence is higher in eastern Oklahoma due to the heavier foliage.

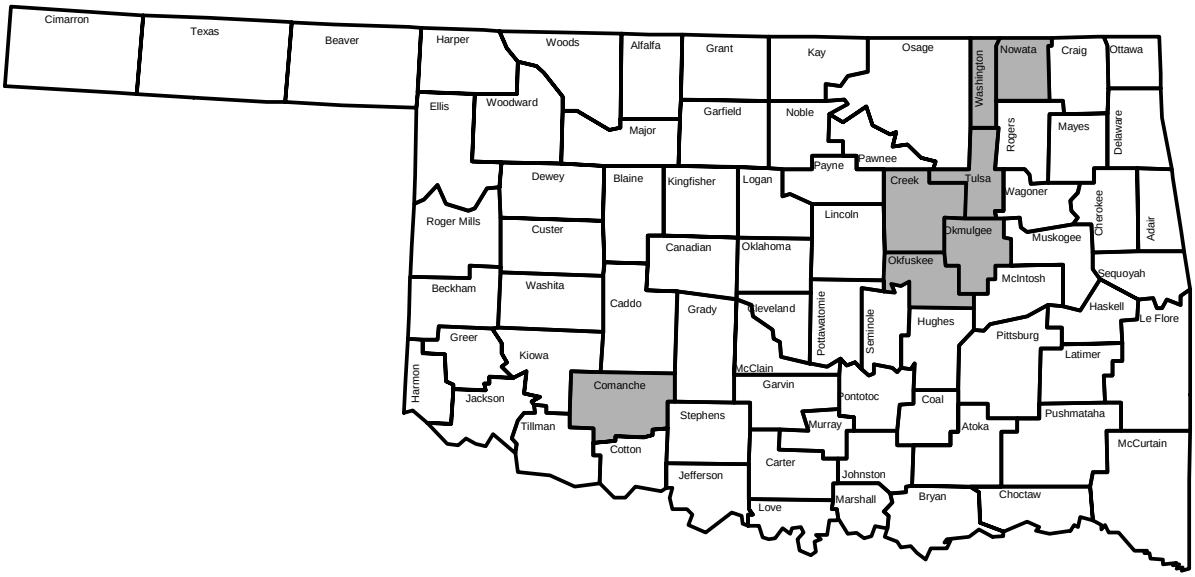
Tularemia has a variety of clinical manifestations depending on the route of exposure. There are six clinical forms related to the mode of transmission: ulceroglandular, glandular, oculoglandular, oropharyngeal, typhoidal and pneumonic. The most commonly reported clinical presentation of tularemia in Oklahoma is an indolent ulcer at the site of introduction of the organism (ulceroglandular type). There may be no apparent ulcer but only one or more enlarged lymph nodes that may suppurate (glandular type). Ingestion of organism in contaminated food or water may produce a painful pharyngitis, abdominal pain, vomiting and diarrhea (oropharyngeal type). Inhalation of the organisms may be followed by pneumonic involvement or sepsis.

Laboratory infections have occurred in Oklahoma, which frequently presents as a pneumonia or typhoidal form of Tularemia. Diagnosis is made clinically by a rise in serum antibodies usually in the second week of infection. The causative bacteria can be cultured from lesion exudates and blood. Streptomycin or Gentamycin taken for 7 to 14 days is the drug of choice.

Reported cases of Tularemia, Oklahoma, 1992-2002



Counties with Reported Cases of Tularemia, Oklahoma, 2002



Special Surveillance Projects and Outbreak Reports

Shigellosis Outbreak Associated with a Long-Term Care Facility for the Mentally Disabled, Oklahoma, 2002

On January 15, 2002, the Communicable Disease Nurse (CDN) for the county health department received a report of a confirmed shigellosis case. The case was identified as a resident of a long-term care facility for the mentally retarded. A routine investigation by the CDN revealed additional residents and employees had been, or were continuing to experience gastrointestinal illness. An investigation was initiated with the objectives to: (1) confirm the additional gastrointestinal illness was shigellosis, and (2) identify factors resulting in transmission of *Shigella* and institute public health measures to prevent further spread of the disease.

The investigation consisted of identification of cases, observation of infection control practices, and a standard food service inspection. Identification of cases was achieved through chart reviews, enhanced monitoring of residents health, and in-person interviews of all employees. Enteric test kits were provided to all persons experiencing diarrhea. The Public Health Laboratory provided microbiological testing. For the purpose of this investigation, a "case" was defined as a culture-confirmed infection of *Shigella* with onset of symptoms after December 20, 2001, and was a client, employee, or otherwise associated with the residential care facility. All cases were interviewed to determine their onset dates, symptoms, and risk factors for contracting shigellosis.

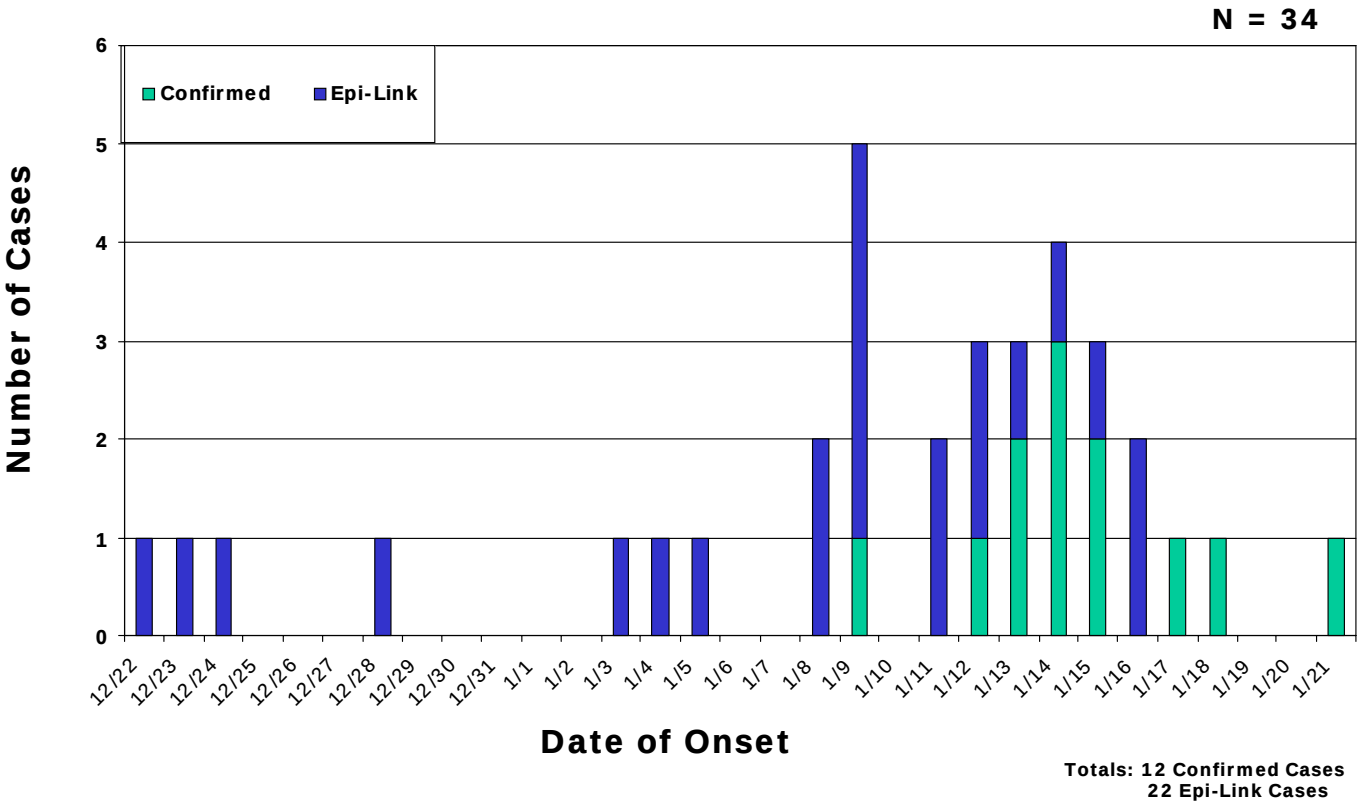
A total of 34 cases of shigellosis, 12 confirmed and 22 epi-links, were identified among persons associated with the facility. Cases included 27 residents, 6 employees, and 1 family member of an employee. The onset of symptoms occurred between December 22, 2001 and January 21, 2002. Ages of cases ranged from 2 to 60 years with a median age of 47 years. Fifty-nine percent of cases were male. Reported symptoms included diarrhea (100%), fever (38%), nausea (28%), and vomiting (19%). No cases were hospitalized and no deaths were attributed to this outbreak.

The cases occurred in residents and employees in each wing of the facility over a period of 1 month. The investigation identified the necessity for additional training of employees on infection control practices, particularly hand hygiene. Antibiotic therapy was recommended and provided to all symptomatic persons. Following the administration of antibiotics and an increased attention to enteric precautions the number of cases rapidly decreased. No additional cases in the county were reported.

Shigellosis is highly communicable due to the low infectious dose (10-100 bacteria) and prolonged shedding of large numbers of bacteria in stool for up to one month. Rapid reporting and investigation of shigellosis cases are a priority, particularly among high-risk groups that include child-care centers, nursing homes, and other group home environments. In 2002, reported cases of shigellosis reached a 20-year high in Oklahoma. Outbreaks of Shigellosis in high-risk settings contributed to the substantial increase in cases. An outbreak of *Shigellosis* in a single facility can rapidly progress to a community wide problem.

Data set on next page

Shigellosis Outbreak Associated with a Long-Term Care Facility for the Mentally Disabled, Oklahoma, 2002 - Data Set



Outbreak of hepatitis B virus and hepatitis C virus infections in out-patient settings

In August 2002, the Oklahoma State Department of Health (OSDH) was informed that a gastroenterologist was treating six patients with suspected acute HCV infection who had received treatment from the same pain remediation clinic. A preliminary investigation by OSDH revealed that a certified registered nurse anesthetist (CRNA) routinely reused needles and syringes during individual clinic sessions. A single needle/syringe was used to administer each of three sedation medications (Versed [midazolam HCl], fentanyl, and propofol) to up to 24 sequentially treated patients at each clinic session. These medications were administered through heparin locks that were connected directly to intravenous cannulas.

As a result of these findings, the clinic was closed and an investigation was initiated. Serologic testing for HCV, HBV, and HIV infection was completed for 791 (87%) of the 907 total patients attending the clinic between its opening in April 1999 and its closure in August 2002. A total of 69 HCV and 31 HBV infections were identified that were likely acquired in the clinic. No HIV infections were identified. Receiving treatment after a patient who was anti-HCV positive on one or more clinic dates was a significant risk factor for acquiring HCV infection (RR=9.5, 95% CI=3.7-24.0). Likewise, receiving treatment after a patient who was hepatitis B surface antigen positive was a significant risk factor for acquiring HBV infection (RR=10.5, 95% CI=4.2-26.5). Prior to this investigation, in June 2002, the CRNA ceased reuse of needles after a complaint was filed by staff nurses. After June 2002, there was no evidence of HBV or HCV transmission associated with the clinic.

The state board of nursing revoked the CRNA's license and imposed a $99,000 fine. In response to this outbreak, the American Association of Nurse Anesthetists (AANA) sent mailings to all AANA members and students, nurse anesthesia school program directors, and hospital administrators reminding them that needles and syringes should not be reused on the same patient or from patient to patient.

Influenza and Upper Respiratory Virus Surveillance, Oklahoma - October 2002 – April 2003

A combined approach utilizing laboratory-based surveillance and influenza–like illness syndromic surveillance at sentinel sites throughout the state is used to monitor influenza and other upper respiratory virus activity in Oklahoma. During the 2002-2003 season, five hospital laboratories, one each located in the geographic quadrants of the state and one in the Oklahoma City metropolitan area, provided viral culture and rapid test results to the Oklahoma State Department of Health. Forty-one sites, including physician clinics, nursing homes, schools, and daycares participated in the influenza-like illness (ILI) syndromic surveillance program by providing weekly reports of ILI morbidity based on client visits or absenteeism. The formal influenza surveillance period begins the first week of October and ends the last week of April. However, the potential exists for travel-associated influenza outbreaks during the summer months, or the emergence of a novel highly pathogenic avian influenza strain such as influenza A (H5N1), so alertness to occurrences of influenza virus transmission needs to be present year-round.

The first identification of influenza activity in Oklahoma for the 2002-2003 season occurred during the last week of November 2002. Testing of referred isolates and respiratory specimens at the Oklahoma State Department of Health (OSDH) Laboratory confirmed four index cases of influenza caused by Type B/Hong Kong. These initial cases were linked to a junior high school event in Texas county. During the month of December 2002, several school-associated outbreaks of influenza-like illness throughout the state were reported to the OSDH. The first isolation of a type A (H1) influenza virus was reported on January 13, 2003. Previously, all reported influenza infections in the state had been caused by the type B Hong Kong strain of the virus with the pediatric population most affected. All Oklahoma influenza A viral isolates forwarded to the Centers for Disease Control and Prevention (CDC) for subtyping and further characterization proved to be type A (H1N1). Nationally, 70% of the influenza A isolates were subtype H1 and 30% were H3N2. The CDC identified a newly circulating influenza A (H1N2) strain that appears to be the result of genetic reassortment between circulating influenza A (H1N1) and A (H3N2) subtypes. Despite the emergence of this new H1N2 subtype, the 2002-03 influenza vaccine provided protection against infection with this virus.

Overall influenza activity in the 2002-03 season can be described as “mild” with influenza type B/Hong Kong-like being the predominant viral strain circulating from latter November 2002 to early February 2003. Influenza activity peaked in Oklahoma during the week of January 31, 2003 with approximately 21% of respiratory specimens testing positive for influenza at sentinel laboratories. Significant transmission levels of respiratory syncytial virus (RSV) were observed from early January 2003 until mid-March 2003. The OSDH Laboratory also isolated type 3 adenoviruses and Coxsackie type B1 virus from respiratory swabs submitted for viral culture and isolation.

Oklahoma Tickborne Disease Surveillance Project

The Oklahoma Tickborne Disease Surveillance Project began in the fall of 1999 to better define the epidemiology and risk factors for tickborne illness in Oklahoma. Collaborators are the Communicable Disease Division of the Oklahoma State Department of Health, the Oklahoma Physicians' Research/Resource Network (OKPRN), Department of Family and Preventive Medicine, and the OU College of Medicine.

The project employs an active surveillance system in which participating OKPRN physicians identify patients with an illness compatible with a tickborne disease, collect a small amount of demographic and risk factor information about the patient, and attempt to obtain both acute and convalescent serum samples. Testing for *Rickettsia rickettsii*, *Ehrlichia chaffeensis*, *Rickettsia typhi* and *Bartonella henselae* is provided free of charge by the OSDH Public Health Laboratory.

A project epidemiologist is assigned from the Communicable Disease division to follow all suspected cases and work with the physicians and the patients to ensure follow-up convalescent specimens are submitted 4-6 weeks after the acute. In addition, the project epidemiologist analyzes data and submits periodic summary reports for all participating physicians. The project is flexible in allowing non-OKPRN physicians throughout the state to submit serum samples contingent upon submitting paired sera and providing patient information. Physicians interested in submitting samples may call Mikie Grubbs, project epidemiologist at 405-271-4060.

Specimens Submitted 2002

	Acute sera	Convalescent sera	Positive
OKPRN	32	17	02
Non-OKPRN	62	12	08
Total	94	29	10*

* 5-RMSF; 1-Ehrlichia; 4- Bartinella

Vibrio vulnificus in Oklahoma, 2002

Several *Vibrio* species are pathogenic to humans, which include *V. cholerae* O1/O139, *V. cholerae* non-O1/O139, *V. vulnificus*, and *V. parahaemolyticus* with symptoms of illness ranging from gastroenteritis and wound infections to septicemia. *Vibrio* infections are reportable in Oklahoma and isolates of *Vibrio* species are required to be forwarded to the Oklahoma State Department of Health (OSDH), Public Health Laboratory (PHL) for confirmation and typing. The following is a report of a *Vibrio vulnificus* case reported to the OSDH, Communicable Disease Division (CDD) for investigation.

Case report. In August 2002, a 51-year-old Oklahoma county resident presented to a local emergency room complaining of a 4-day history of fever, chills, nausea and vomiting, and diarrhea. Further evaluation revealed the patient had a maculopapular rash that spread from the extremities to his torso and several bullous lesions located on his extremities. He had a history of end stage liver disease with cirrhosis, presumably due to chronic alcohol abuse, and upper gastrointestinal bleeding. The physician suspected *Vibrio vulnificus* and promptly reported the case to CDD for investigation. A wound specimen grew *V. vulnificus*, which was confirmed by the PHL. Exposure history revealed the patient had consumed a meal that included raw oysters approximately 24 hours before symptom onset. Investigation of the restaurant shipping records indicated the oysters had been received fresh and from a certified source.

Vibrio vulnificus infections are uncommon in inland areas, but whey they do occur, most people are infected through the ingestion of contaminated, raw or undercooked seafood. Among healthy people, *V. vulnificus* can cause vomiting, diarrhea, and abdominal pain. In some people, the infection spreads into the blood stream and causes septicemia. *V. vulnificus* infection has been identified as a cause of fatal septicemia in persons with specific underlying medical conditions; those at highest risk of life threatening illness include persons with liver disease, alcoholism, diabetes mellitus, malignancies, or immunosuppressive disorders. Typical symptoms of severe illness include fever, chills, decreased blood pressure, and swollen legs with hemorrhagic skin lesions.[1] Clinicians should advise their patients with these conditions not to eat raw or undercooked seafood including raw oysters.

_____

[1] Blake PA, Merson MH, Weaver RE, Hollis DG, Heublein PC. Disease caused by a vibrio. NEJM 1979;300:1-4.

Outbreak of Acute Gastroenteritis of Unknown Etiology Associated with a Local Restaurant in Chickasha, Oklahoma, October 2002

On October 11, 2002, the Communicable Disease Division (CDD) was notified by a Communicable Disease Nurse (CDN) of the Grady County Health Department (CHD), regarding 9 persons hospitalized at the Grady Memorial Hospital with bloody diarrhea, abdominal cramping, and vomiting. Preliminary investigative findings by the CDN indicated cases reported consuming foods from Restaurant A in Chickasha, Oklahoma during the 7 days prior to illness onset. An investigation was initiated by CDD to determine: 1) the scope of the outbreak, 2) the identification of the potential source of infection, and 3) the presence (or absence) of an ongoing threat to the public's health.

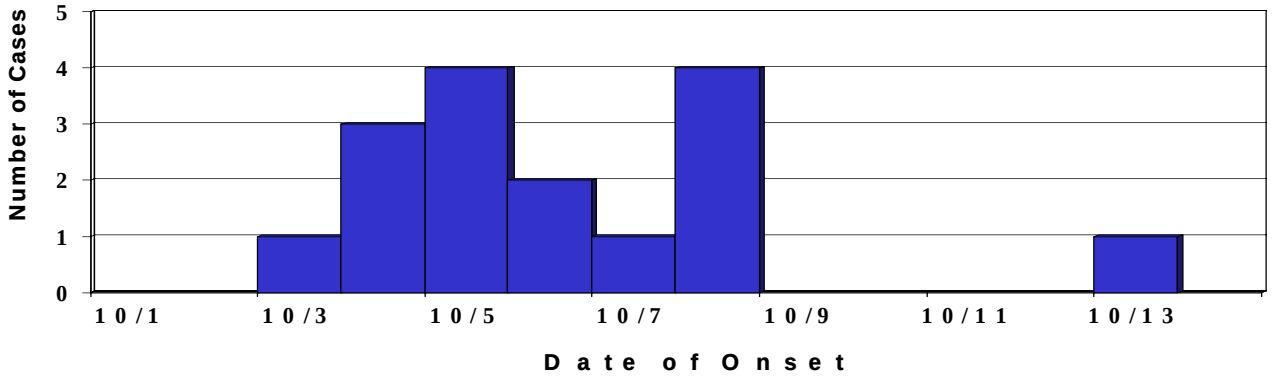
A case-control study was undertaken to determine the most likely food source of infection. Because initial case interviews indicated Restaurant A as a possible source of infection, a case-control study was conducted to determine if exposure to a particular food item(s) from the establishment under investigation was a significant determinant of illness. A "case" was defined as a person either with a history of bloody diarrhea or with non-bloody diarrhea ($\geq$ 3 loose stools in a 24-hour period) and abdominal cramps lasting at least 2 days in a resident of Grady County or surrounding counties who had an onset of symptoms between October 1, 2002 and October 18, 2002. A "control" was defined as a meal companion identified by a case that consumed foods from the implicated establishment during the same day(s) as the case and did not report symptoms of acute gastroenteritis between October 1 and October 18. Participants were interviewed by standard questionnaire regarding food histories from Restaurant A and other exposures.

A total of 16 cases of diarrheal illness that met the case definition were identified through initial reports and active surveillance mechanisms. Cases reported an onset of symptoms between October 3 and October 13. Descriptive information of cases is listed in Table One. Fifty percent (8) of cases were women and the remaining 8 (50%) were men. Ages of cases ranged from 36 to 84 years with a median age of 62 years. Eighty-seven percent (14) of cases resided in Grady County and the remaining 2 cases reported residing in Caddo County and Garvin County. Illness histories were collected from each case (refer to Table Two). Reported symptoms included diarrhea (100%), blood in stool (81.2%), fever (43.8%), nausea (75%), vomiting (37.5%), abdominal pain (93.8), and fatigue (87.5%). Fifteen cases (93.8%) sought medical care from their primary care physician or emergency room and 11 cases (68.8%) were hospitalized. No deaths were attributed to this outbreak.

Sixteen cases and 10 meal companion controls were included in the case-control study. Results of analysis revealed that consumption of salad bar items from Restaurant A was significantly associated with diarrheal illness (X^2 = 5.42, p-value = 0.046). All 16 cases reported consuming foods from the salad bar compared to 7 (70%) controls (OR = Undefined). Consumption of several food items ordered as the main course or from the salad bar revealed an increased odds of illness, however, none were statistically significant.

An outbreak of severe gastrointestinal illness of unknown etiology occurred in Grady County during October 2002. Results of this outbreak investigation revealed consumption of foods from Restaurant A was significantly associated with illness. Sixteen cases from Grady County and surrounding counties in October 2002 were found to be associated with this outbreak. The most likely agent was an enterohemorrhagic *E. coli* or Shiga toxin producing *E. coli*. All 16 cases reported dining at the implicated establishment 1 to 7 days prior to onset of illness, which is consistent with the incubation period of enterohemorrhagic *E. coli* or Shiga toxin producing *E. coli*.

Onset of Diarrheal Illness Among Cases, Acute Gastroenteritis Outbreak Investigation, Chickasha, Oklahoma, October 2002 (N = 16)



Case-control study results comparing cases and meal companion controls from Restaurant A, acute gastroenteritis outbreak investigation, Chickasha, Oklahoma,

Exposure	Cases (N=16) No. (%)	Controls (N=10) No. (%)	Odds Ratio (95% C.I.)	p-value
Consumed salad bar items	16 (100%)	7 (70%)	Undefined	0.046
Lettuce (salad bar or entrée)	15 (93.7%)	8 (80%)	3.75 (0.21, 126.9)	NS
Tomato (salad bar or entrée)	5 (33%)	5 (50%)	0.5 (0.07, 3.46)	NS
Carrots (salad bar or entrée)	4 (26.6%)	2 (20%)	1.45 (0.15, 15.5)	NS
Cucumber from salad bar	6 (40%)	2 (20%)	2.67 (0.31, 26.92)	NS
Corn from salad bar	1 (6.3%)	1 (10%)	0.6 (0.01, 26.08)	NS
Green beans from salad bar	2 (12.5%)	1 (10%)	1.29 (0.07, 42.8)	NS
Okra from salad bar	6 (40%)	5 (50%)	0.6 (0.09, 3.97)	NS
Cheese (salad bar or entrée)	8 (50%)	4 (40%)	1.5 (0.23, 10.2)	NS
Strawberries from salad bar	2 (12.5%)	0	Undefined	NS
Cantaloupe from salad bar	1 (6.3%)	0	Undefined	NS
Peaches from salad bar	4 (25%)	1 (10%)	3.0 (0.22, 85.31)	NS
Pineapple from salad bar	3 (18.8%)	1 (10%)	2.08 (0.14, 62.3)	NS
Potato	14 (87.5%)	9 (90%)	0.78 (0.02, 14.3)	NS
Celery from salad bar	1 (6.3%)	1 (10%)	0.6 (0.01, 26.08)	NS
Fish	3 (18.8%)	2 (20%)	0.92 (0.09, 10.49)	NS
Chicken	9 (56.3%)	4 (40%)	1.93 (0.29, 13.3)	NS
Steak	3 (18.8%)	2 (20%)	0.92 (0.09, 10.49)	NS
Ground sirloin	2 (12.5%)	4 (40%)	0.21 (0.02, 2.03)	NS
Cornbread from salad bar	1 (6.3%)	0	Undefined	NS

Surveillance Summary of the 2002 West Nile Virus Epidemic; Oklahoma

West Nile virus (WNV) was first recognized as an emerging pathogen in the United States in the New York City area during the summer of 1999. With each successive mosquito season, WNV activity has rapidly spread extending to a geographic range of 44 states by the end of 2002. The Oklahoma State Department of Health (OSDH) initiated a WNV surveillance program to collect and test dead wild bird, equine, and human clinical specimens beginning April 2001. The first evidence of West Nile virus transmission in Oklahoma occurred July 16, 2002 when a dead crow collected in the Tulsa metropolitan area tested positive for West Nile virus. The state's first West Nile epizootic and epidemic soon followed.

Human Surveillance

The national 2002 WNV epidemic was the largest arboviral meningoencephalitis epidemic ever documented in the western hemisphere to-date. A total of 4,156 human infections with 284 deaths were reported to the Centers for Disease Control and Prevention via the web-based surveillance data network called ArboNet. Human cases were reported from 619 counties in 37 states and the District of Columbia. Illinois (884 cases), Michigan (614), Ohio (441), Louisiana (329), and Indiana (293) accounted for 62% of the cases.

Twenty-one cases of West Nile disease were laboratory-confirmed in Oklahoma during the 2002 mosquito season. Of these 21 cases, ten (48%) had West Nile meningoencephalitis, four (19%) had primary encephalitis, four (19%) had a febrile illness with or without a rash, two (9.5%) had asymmetrical leg paralysis, and one (4.5%) had an unclassified clinical syndrome. Two persons with West Nile encephalitis died. Illness onset dates ranged from July 19 to October 20, 2002 [refer to Figure 1]; however, the first confirmed human infection with onset in July was attributed to mosquito exposure out-of-state. An extensive epidemiologic investigation of two cases (9.5%) who had received transfusion of blood or blood products within three weeks of symptom onset determined person-to-person transmission had occurred through receipt of WNV-contaminated blood products from asymptomatic viremic blood donors. Eleven (52%) of the case-patients were male; median age of all infected persons was 64 years (range: 12 – 78 years).

Animal Surveillance

Avian

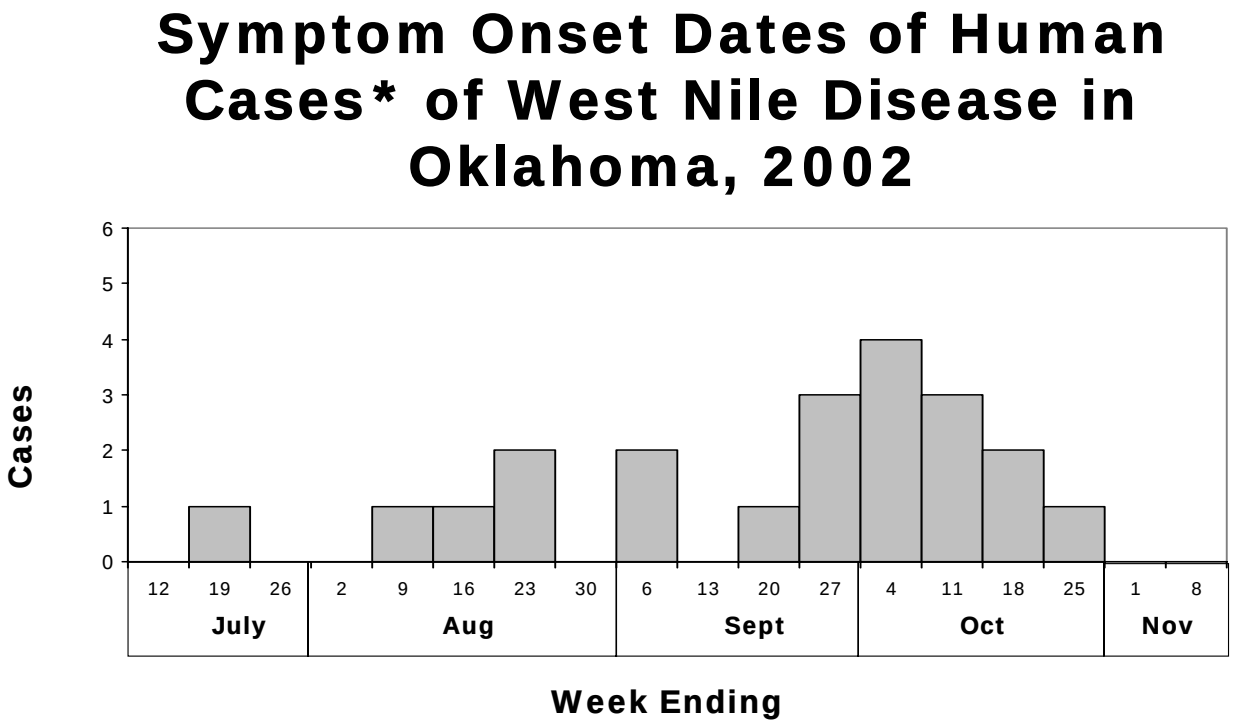
Of the thirteen Oklahoma counties with reported human cases, ten (77%) had a WNV-infected bird as a first indicator of WNV activity. A sum of 3,481 dead wild birds were submitted for WNV testing. Fifty-nine percent (2,063) of the avian specimens were suitable for WNV testing. Four hundred forty-one birds (21%) of 28 different species tested positive. Blue jays represented the majority of WNV-positive birds (273/441, 62%). WNV-infected birds originated from 38 Oklahoma counties. The peak number of infected birds occurred during the week ending August 17.

Equine and Other Animal

Oklahoma's equine industry was significantly impacted by the incursion of WNV. The first laboratory-confirmed equine case was reported on August 9. Equine infections totaled 965 cases and peaked the week of October 11, 2002. Equine cases were represented in every county of Oklahoma with the highest number of cases occurring in western and central areas of the state. Three squirrels and one seven week-old puppy also had laboratory evidence of West Nile virus infection by PCR testing of brain tissue.

Public Health Response

During the 2002 WNV epidemic, the OSDH provided weekly surveillance data in media releases and webpage updates. Public education messages stressed the importance of personal protection measures to reduce mosquito exposure and methods to reduce residential mosquito habitats. Some communities received financial assistance to augment local integrated mosquito control programs.



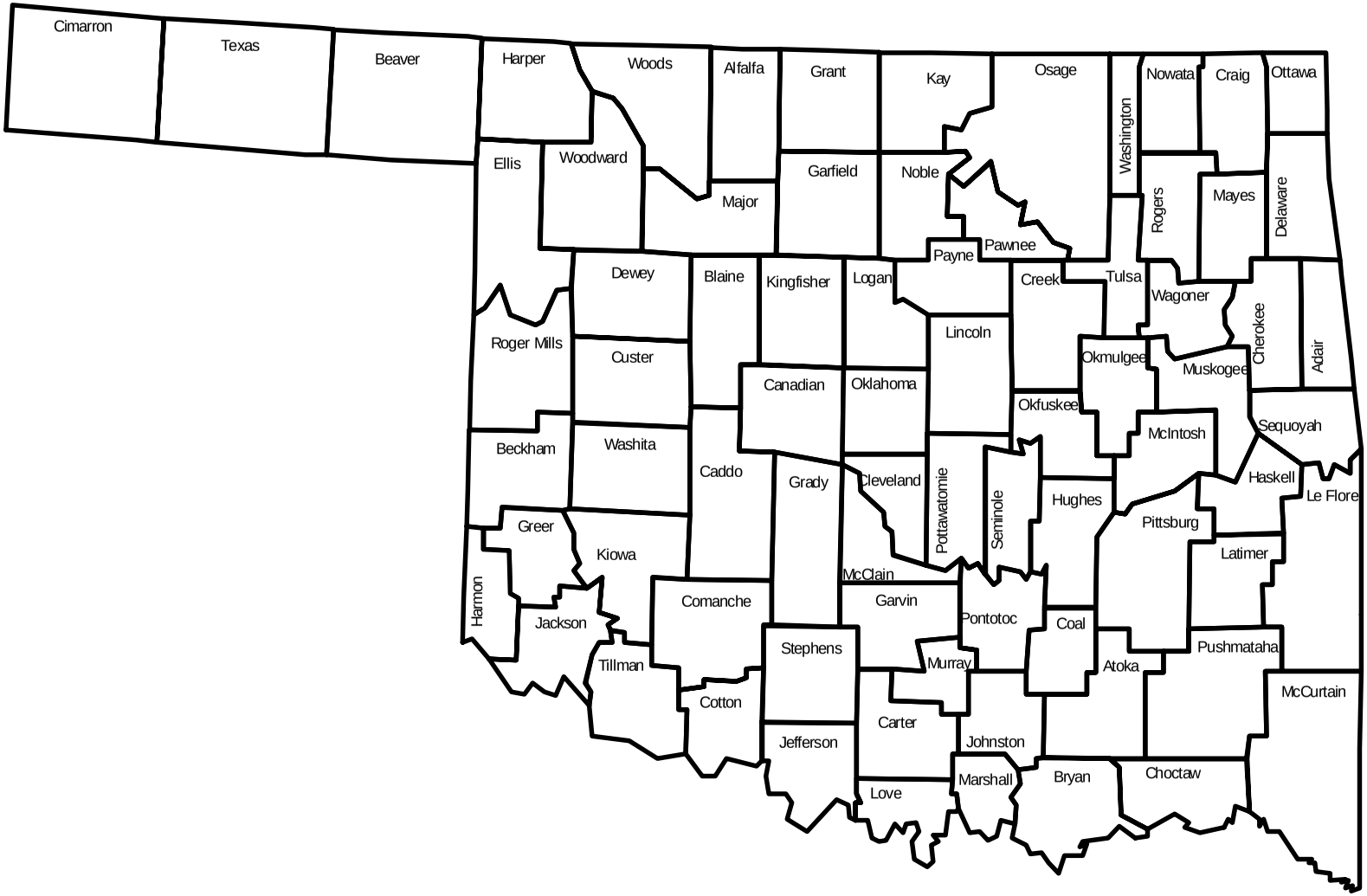
* N= 21 cases of probable or confirmed WNV infection by detection of IgM antibodies in CSF or serum.

Table of 2001 Outbreaks and Unusual Illnesses

Disease/Organism	Vehicle (Contributory Factors)	Facility Type	County	# of Cases
Hantavirus Pulmonary Syndrome	Cleaning Rodent Excrement in Home	Private Home	Texas	1
Viral GI/Norwalk-like	Food Buffet	Lodge Restaurant	Cherokee	22/70 interviewed
C. perfringens	Roast Beef (Suspected)	Restaurant	Cleveland	7
C. perfringens	Large Holliday Meal (Suspected)	Mentally Handicapped	Okfuskee	7
Salmonella heidelberg	Not Identified	(Cluster)	Tulsa	4
E. coli O157:H7	Not Identified	(Cluster)	Tulsa	4
Viral GI/Norwalk-like	Not Identified	Funeral Reception	Oklahoma	13
Histoplasmosis	Building Construction in Hotel	Hotel-Acapulco, MX	Mexico	6
Salmonella enteritidis	BBQ meat items (cross-contamination, inadequate cooking/hot-holding temperatures)	Barbecue stand	Oklahoma	51
Shigella	Person to Person Spread in Day Care Centers	Community	Comanche	54

Appendix

Oklahoma Map with Counties Noted



STATE OF OKLAHOMA
COUNTY HEALTH DEPARTMENTS

ASK FOR THE COMMUNICABLE DISEASE NURSE

ADAIR COUNTY HEALTH DEPARTMENT
600 West Hickory (918) 696-7292
Stilwell, Oklahoma 74960

ATOKA COUNTY HEALTH DEPARTMENT
1006 West 13th Street (580) 889-2116
Atoka, Oklahoma 74525

BEAVER COUNTY HEALTH DEPARTMENT
P.O. Box 520 (580) 625-3693
Beaver, Oklahoma 73932

BECKHAM COUNTY HEALTH DEPARTMENT
111 West Main (580) 928-5551
Sayre, Oklahoma 73662

400 East Third (580) 225-1173
Elk City, Oklahoma 73644

BLAINE COUNTY HEALTH DEPARTMENT
521 West 4th (580) 623-7977
Watonga, Oklahoma 73772

BRYAN COUNTY HEALTH DEPARTMENT
1303 Waco (580) 924-4285
P.O. Box 598
Durant, Oklahoma 74702-0598

CADDO COUNTY HEALTH DEPARTMENT
216 West Broadway (405) 247-2507
P.O. Box 236
Anadarko, Oklahoma 73005

CANADIAN COUNTY HEALTH DEPARTMENTS
100 South Rock Island (405) 262-0042
El Reno, Oklahoma 73036-2721

1023 East Vandament (405) 354-4872
Yukon, Oklahoma 73099

CARTER COUNTY HEALTH DEPARTMENTS
101 First Avenue, SW (580) 223-9705
Ardmore, Oklahoma 73401

City Hall, 308 Franklin (580) 229-1291
Box 298
Healdton, Oklahoma 73438

CHEROKEE COUNTY HEALTH DEPARTMENT
912 South College (918) 456-8826
Tahlequah, Oklahoma 74464

CHOCTAW COUNTY HEALTH DEPARTMENT
103 South Fourth Street (580) 326-8821
Hugo, Oklahoma 74743

CLEVELAND COUNTY HEALTH DEPARTMENT
250 12th Ave. N.E (405) 321-4048
Norman, Oklahoma 73071

224 South Chestnut (405) 794-1591
Moore, Oklahoma 73160

COAL COUNTY HEALTH DEPARTMENT
1404 South Highway 75 (580) 927-2367
P.O. Box 365
Coalgate, Oklahoma 74538-0365

COMANCHE COUNTY HEALTH DEPARTMENT
1010 South Sheridan Road (580) 248-5890
P.O. Box 87
Lawton, Oklahoma 73501

COTTON COUNTY HEALTH DEPARTMENT
1501– A South 7th (580) 875-6121
Walters, Oklahoma 73572

CRAIG COUNTY HEALTH DEPARTMENT
115 East Delaware (918) 256-7531
Vinita, Oklahoma 74301

CREEK COUNTY HEALTH DEPARTMENTS
1808 South Hickory (918) 224-5531
Sapulpa, Oklahoma 74066

420 East Broadway (918) 352-9581
P.O. Box 848
Drumright, Oklahoma 74030

408 West 4th (918) 367-3341
Bristow, Oklahoma 74010

CUSTER COUNTY HEALTH DEPARTMENT
3030 Custer Avenue (580) 323-2100
Clinton, Oklahoma 73601

220 North Bradley (580) 772-6417
Weatherford, Oklahoma 73096

DELAWARE COUNTY HEALTH DEPARTMENT
Highway 59 West (918) 253-4511
P.O. Drawer 370
Jay, Oklahoma 74346

GARFIELD COUNTY HEALTH DEPARTMENT
2501 Mercer Drive (580) 233-0650
P.O. Box 3266
Enid, Oklahoma 73701

GARVIN COUNTY HEALTH DEPARTMENTS
1809 South Chickasaw (405) 238-7346
P.O. Box 899
Pauls Valley, Oklahoma 73075

710 West Comanche (405) 756-2928
P.O. Box 490
Lindsay, Oklahoma 73052

GRADY COUNTY HEALTH DEPARTMENT
2116 Iowa Street (405) 224-2022
Chickasha, Oklahoma 73018

GRANT COUNTY HEALTH DEPARTMENTS
115 North Main (580) 395-2906
Medford, Oklahoma 73759

127 South Second Street (580) 532-4231
P.O. Box 429
Pond Creek, Oklahoma 73766

GREER COUNTY HEALTH DEPARTMENT
2100 N. Louis Tittle (580) 782-5531
Mangum, Oklahoma 73554

HARMON COUNTY HEALTH DEPARTMENT
1104 North 7th (580) 688-3348
Hollis, Oklahoma 73550

HARPER COUNTY HEALTH DEPARTMENTS
7th Oklahoma, Suite 9 (580) 921-2029
Laverne, Oklahoma 73848

1005 N. Hwy. 64 580) 735-6100
Buffalo, Oklahoma 73834

HASKELL COUNTY HEALTH DEPARTMENT
201 East Main (918) 967-3304
Stigler, Oklahoma 74462

HUGHES COUNTY HEALTH DEPARTMENT
200 McDougal Drive (405) 379-3313
Holdenville, Oklahoma 74848-2811

JACKSON COUNTY HEALTH DEPARTMENT
401 W. Tamarack Road (580) 482-7308
Altus, Oklahoma 73521-1599

JEFFERSON COUNTY HEALTH DEPARTMENT
107 East Anderson Avenue (580) 228-2313
Waurika, Oklahoma 73573-3029

JOHNSTON COUNTY HEALTH DEPARTMENT
1151 South Byrd (580) 371-2470
P.O. Box 486
Tishomingo, Oklahoma 73460

KAY COUNTY HEALTH DEPARTMENTS
1201 East Hartford (580) 762-1641
Ponca City, Oklahoma 74602

1706 South Main (580) 363-5520
Blackwell, Oklahoma 74631

KINGFISHER COUNTY HEALTH DEPARTMENT
124 East Sheridan (405) 375-3008
Courthouse Annex Room #101
Kingfisher, Oklahoma 73750-3224

KIOWA COUNTY HEALTH DEPARTMENT
431 West Elm (580) 726-3316
Hobart, Oklahoma 73651

LATIMER COUNTY HEALTH DEPARTMENT
201 West Main (918) 465-5673
Wilburton, Oklahoma 74578

LeFLORE COUNTY HEALTH DEPARTMENTS
1212 Reynolds (918) 647-8601
P.O. Box 37
Poteau, Oklahoma 74953

205 Dallas Street (918) 567-2141
P.O. Box 964
Talihina, Oklahoma 74571

LINCOLN COUNTY HEALTH DEPARTMENT
101 Meadow Lane (405) 258-2640
Chandler, Oklahoma 74834

LOGAN COUNTY HEALTH DEPARTMENT
215 Fairgrounds Road, Suite A (405) 282-3485
Guthrie, Oklahoma 73044

LOVE COUNTY HEALTH DEPARTMENT
200 C.E. Colston Drive (580) 276-2531
Marietta, Oklahoma 73448

McCLAIN COUNTY HEALTH DEPARTMENTS
919 North Ninth Street (405) 527-6541
Purcell, Oklahoma 73080

107 South Main (405) 485-3319
P.O. Box 130
Blanchard, Oklahoma 73010

McCURTAIN COUNTY HEALTH DEPARTMENT
1400 Lynn Lane (580) 286-6620
Idabel, Oklahoma 74745

McINTOSH COUNTY HEALTH DEPARTMENTS
Hospital Road (918) 689-7774
P.O. Box 71
Eufaula, Oklahoma 74432
211 W. Gentry (918) 473-5416
Checotah, Oklahoma 74426

MAJOR COUNTY HEALTH DEPARTMENT
501 East Broadway (580) 227-3362
Fairview, Oklahoma 73737

MARSHALL COUNTY HEALTH DEPARTMENT
310 West Lillie Boulevard (580) 795-3705
P.O. Box 476
Madill, Oklahoma 73446

MAYES COUNTY HEALTH DEPARTMENT
111 Northeast First (918) 825-4224
Pryor, Oklahoma 74361

MURRAY COUNTY HEALTH DEPARTMENT
130 Cambridge Drive (580) 622-3716
P.O. Box 128
Sulphur, Oklahoma 73086

MUSKOGEE COUNTY HEALTH DEPARTMENT
530 South 34th Street (918) 683-0321
Muskogee, Oklahoma 74401

NOBLE COUNTY HEALTH DEPARTMENT
300 East Fir Street (580) 336-2257
Perry, Oklahoma 73077-4902

OKFUSKEE COUNTY HEALTH DEPARTMENT
125 North Second (918) 623-1800
Okemah, Oklahoma 74859

CITY-COUNTY HEALTH DEPARTMENT OF OKLAHOMA COUNTY
921 Northeast 23rd Street (405) 427-8651
Oklahoma City, Oklahoma 73105

OKMULGEE COUNTY HEALTH DEPARTMENTS
1304 R.D. Miller Drive (918) 756-1883
Okmulgee, Oklahoma 74447
404 East Broadway (918) 652-8250
Henryetta, Oklahoma 74437-0078

102 West Main Street (918) 267-3606
P.O. Box 989
Beggs, Oklahoma 74421

OTTAWA COUNTY HEALTH DEPARTMENT
1930 North Elm (918) 540-2481
Miami, Oklahoma 74354

PAWNEE COUNTY HEALTH DEPARTMENTS

639 Seventh Street (918) 762-3643
Pawnee, Oklahoma 74058

1390 West Cherokee (918) 358-2546
Cleveland, Oklahoma 74020

PAYNE COUNTY HEALTH DEPARTMENTS

1321 West 7th Avenue (405) 372-8200
Stillwater, Oklahoma 74074

1001 East Cherry Street (918) 225-3377
P.O. Box 168
Cushing, Oklahoma 74023

PITTSBURG COUNTY HEALTH DEPARTMENT

620 South Third (918) 423-1267
McAlester, Oklahoma 74501

PONTOTOC COUNTY HEALTH DEPARTMENT

1630 East Beverly (580) 332-2011
P.O. Box 10
Ada, Oklahoma 74821-0010

POTTAWATOMIE COUNTY HEALTH DEPARTMENT

1904 Gordon Cooper Drive (405) 273-2157
Shawnee, Oklahoma 74801-8698

PUSHMATAHA COUNTY HEALTH DEPARTMENTS

318 West Main (580) 298-6624
Antlers, Oklahoma 74523

P.O. Box 118 (918) 569-7973
Clayton, Oklahoma 74536

ROGERS COUNTY HEALTH DEPARTMENT

2664 North Highway 88, Unit A (918) 341-3166
Claremore, Oklahoma 74017

SEMINOLE COUNTY HEALTH DEPARTMENT

200 South Brown (405) 257-5401
Wewoka, Oklahoma 74884
1900 Boren Boulevard (405) 382-4369
Seminole, Oklahoma 74868

SEQUOYAH COUNTY HEALTH DEPARTMENT
612 North Oak Street (918) 775-6201
Sallisaw, Oklahoma 74955

STEPHENS COUNTY HEALTH DEPARTMENT
1401 Bois D'Arc (580) 252-0270
Duncan, Oklahoma 73533

TEXAS COUNTY HEALTH DEPARTMENT
1410 North East Street (580) 338-8544
Guymon, Oklahoma 73942

TILLMAN COUNTY HEALTH DEPARTMENT
1500 N. Tenth (580) 335-2163
Frederick, Oklahoma 73542

TULSA CITY-COUNTY HEALTH DEPARTMENT
4616 East 15th Street (918) 582-9355
Tulsa, Oklahoma 74112

WAGONER COUNTY HEALTH DEPARTMENTS
212 North Pierce (918) 485-3022
Wagoner, Oklahoma 74467

28525 East 141st Street
Coweta, Oklahoma 74429 (918) 486-2845

WASHINGTON COUNTY HEALTH DEPARTMENT
3838 State Street (918) 335-3005
Bartlesville, Oklahoma 74006

WOODS COUNTY HEALTH DEPARTMENT
901 - 14th Street (580) 327-3192
Alva, Oklahoma 73717

WOODWARD COUNTY HEALTH DEPARTMENT
1631 Texas Avenue (580) 256-6416
Woodward, Oklahoma 73801