Department of State Health Services
Health Service Region 1
Epidemiology Response Team

EPI Tōme
Newsletter

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"Please be kind…report on time!"

Warmer Weather Prompts Tick-borne Disease Awareness

Although tick-borne disease may occur at any time of the year, the majority of cases of tick-borne disease peak in the summer months, particularly June and July. Tick-borne disease is caused by bacteria, viruses, and parasites. In Texas, there are six reportable conditions caused by tick-borne disease listed on the 2013 Notifiable Conditions List, two of which were newly added this year. These tick-borne reportable conditions are anaplasmosis, babesiosis, ehrlichiosis, Lyme disease, relapsing fever, and spotted fever group rickettsioses. The following descriptions are an overview of each disease including the agent and reservoir, signs and symptoms, and epidemiology. Please refer to the Texas Department of State Health Services (TX DSHS) Epi Case Criteria Guide, 2013, for specific laboratory criteria for each disease. Each tick-borne disease should be reported to TX DSHS Health Service Region 1, Zoonosis Control within 1 week of diagnosis.

Anaplasmosis

Anaplasmosis is a disease caused by the gram-negative bacterium *Anaplasma phagocytophilum*. This pathogen is transmitted to humans by the black-legged tick (*Ixodes scapularis)* in Texas. The incubation period is 5 to 10 days after a tick bite. The tick bite is usually painless and people often do not remember being bitten. Symptoms may include fever, headache, muscle pain, malaise, chills, nausea, abdominal pain, cough, confusion and rash (less than 10% of cases develop a rash). More severe clinical presentations of this disease include acute respiratory distress syndrome, encephalopathy, meningitis, disseminated intravascular coagulation, spontaneous hemorrhage and renal failure. Since detectable antibody titers are not observed until 7 to 10 days after illness onset, diagnosis is usually made on clinical signs and symptoms and confirmed later using specialized confirmatory lab tests. According to the CDC, the incidence of anaplasmosis in the United States has steadily increased from 1.4 cases per million persons in 2000 to 6.1 cases per million persons in 2010. This disease just became a reportable condition in Texas for 2013, so no state-specific data are available at this time. The case fatality rate is less than 1%.

The blacklegged tick (*Ixodes scapularis*) depicted here transmits anaplasmosis, babesiosis, and Lyme disease to humans. Photo courtesy of the CDC Public Health Image Library, ID#1669.

Babesiosis

Babesiosis is a disease caused by the protozoan parasite *Babesia microti*. It is spread to humans by the black-legged tick (*Ixodes scapularis*). The incubation period is about 1 week to several months after tick bite. Most infections are asymptomatic. Clinical manifestations include hemolytic anemia and non-specific flu-like symptoms, such as fever, chills, sweats, headache, body aches, loss of appetite, nausea or fatigue. More severe clinical presentations of this disease include low and unstable blood pressure, hemolysis, thrombocytopenia, disseminated intravascular coagulation, malfunction of vital organs and death. In 2013, babesiosis became a reportable condition in Texas; and, in 2011, it became a reportable condition in the United States. Statistics are not available at this time at the state and national level.

Ehrlichiosis

In Texas, ehrlichiosis is a disease caused by one of two bacteria, *Ehrlichia chaffeenis* or *Ehrlichia ewingi*. It is transmitted to humans by the bite of the lone star tick (*Amblyomma americanum).* The incubation period is usually 5 to 10 days after tick bite. Symptoms may include fever, headache, chills, malaise, muscle pain, nausea, vomiting, diarrhea, confusion, conjunctival injection and rash. Rash is usually variable in appearance and location. It has been seen in up to 60% of children and less than 30% in adults. More severe manifestations of this disease include acute respiratory distress syndrome, encephalopathy, meningitis, disseminated intravascular coagulation, spontaneous hemorrhage and renal failure.

Table 1: Select reportable conditions, confirmed and probable (as applicable), DSHS HSR 1, all public health jurisdictions
January 01, 2010 December 31, 2012, by Month/Year
Data source: Texas NEDSS Database. Date extracted: 04/30/2013. These counts are generated by DSHS HSR1 and may vary from official state data.

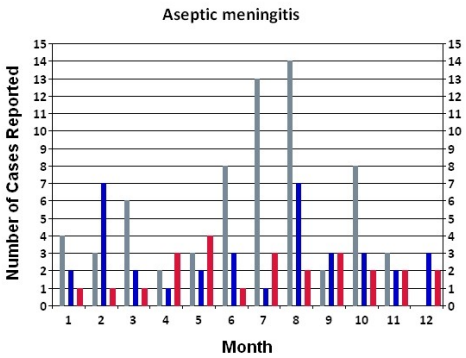
Condition	2010 - 2nd Six Months							2011 - 2nd Six Months							2012 - 2nd Six Months							2012 Total	2011 Total	2010 Total
	Jul	Aug	Sep	Oct	Nov	Dec	Total (6 mo)	Jul	Aug	Sep	Oct	Nov	Dec	Total (6 mo)	Jul	Aug	Sep	Oct	Nov	Dec	Total (6 mo)			
Amebiasis							0							0							0	1	0	1
Aseptic (viral) meningitis	13	14	2	8	3		40	1	7	3	3	2	3	19	3	2	3	2	2	2	14	25	36	66
Bacterial and other meningitis	3	2				2	7			1			2	3	1	1			2		4	5	5	15
Botulism, infant							0							0							0	0	1	0
Campylobacteriosis	17	16	18	12	10	3	76	17	16	20	16	6	8	83	19	28	15	14	16	7	99	181	137	118
Cryptosporidiosis	1	5	11	1	3		21	4	5	6	2			17	3	1			2	1	7	8	31	26
Haemophilus influenzae, invasive							0							0							0	0	0	1
Hemolytic uremic syndrome					1		1	1						1							0	1	6	1
Hepatitis A, acute		1		1			2	1		1			1	3							0	2	4	3
Hepatitis B Viral Infection, Perinatal							0							0			1				1	1	0	0
Hepatitis B, acute	1	1	1	2	1		6			3		1	1	5							0	2	6	10
Hepatitis C, acute							0			2				2							0	1	3	2
Influenza-associated pediatric mortality							0							0							0	1	0	0
Legionellosis	2						2	1	2					3				1			1	1	5	3
Listeriosis			1				1	1	2	1				4							0	0	4	1
Lyme disease							0							0							0	1	0	1
Malaria	1						1					1		1							0	1	1	3
Mumps						1	1				1	1		2							0	0	2	1
Neisseria meningitidis, invasive							0							0		1					1	1	1	0
Pertussis	7	10	12	15	5	3	52	2			1	2		5	6	2	1		5		14	22	16	89
Salmonellosis	16	33	21	26	17	8	121	35	21	35	28	19	13	151	15	16	21	13	18	11	94	173	221	190
Shiga toxin-producing Escherichia coli	1	3		1	2		7	2	2	3	1		1	9	1	1	3	4		1	10	16	21	10
Shigellosis	20	15	40	38	46	21	180	20	9	9	24	18	21	101	15	11	19	17	32	3	97	178	211	273
Spotted Fever Rickettsiosis							0					1		1						1	1	1	1	0
Streptococcus pneumoniae, invasive	2	2	7	5	16	22	54	3	3	12	4	15	14	51	3	3	7	6	6	9	34	91	127	91
Streptococcus, invasive Group A	3		2			3	8			2	2	1	2	7		1	1		3	5	10	19	20	20
Streptococcus, invasive Group B	4	3	2	3	4	1	17		3	4	6	6	6	25	4	6	9	3	3	5	30	52	46	41
Typhoid fever (Salmonella typhi)							0							0							0	0	1	2
Varicella (Chickenpox)	5	3	7	9	5	5	34	2	2	5	2	6	13	30	2	3	3	5	8	4	25	62	62	92
Vibrio vulnificus infection							0							0							0	1	0	0
Vibriosis, other or unspecified							0							0		2					2	2	0	0
West Nile Fever		1					1							0	4	13	6				23	23	1	1

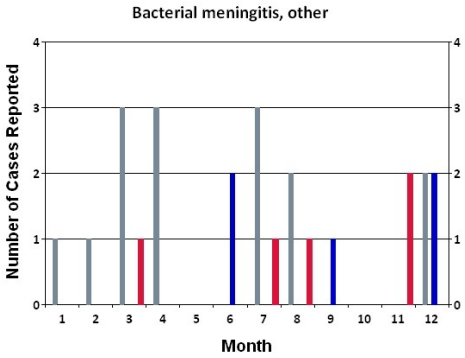
Chart 1: Select reportable conditions, confirmed and probable (as applicable), DSHS HSR 1, all public health jurisdictions
January 01, 2010 through December 31, 2012 by Month/Year
Data source: Texas NEDSS Database. Data extracted: 04/30/13. These counts are generated by DSHS HSR1 and may vary from official state data.

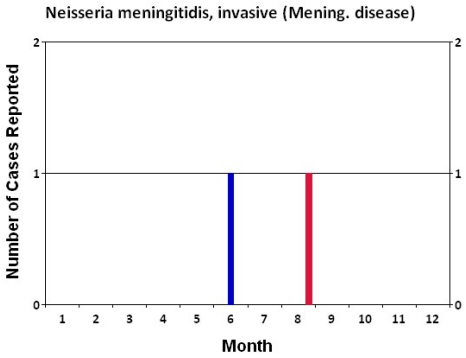
LEGEND

2010 2011 2012

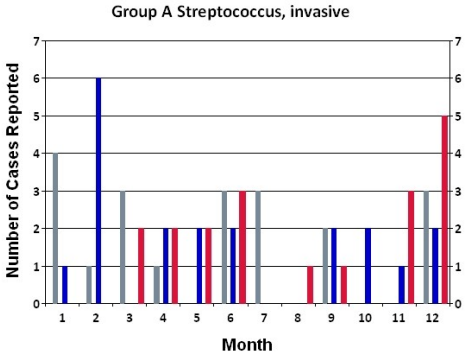
Meningitis

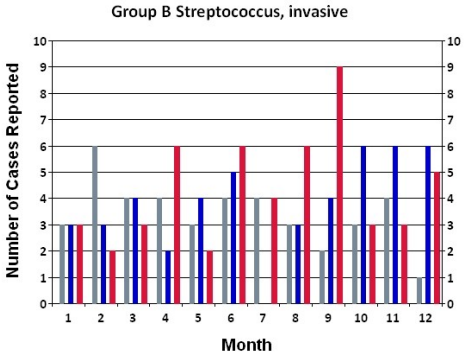


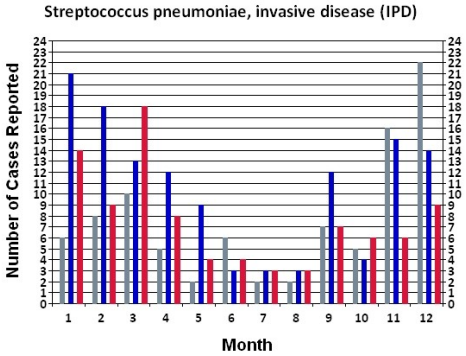




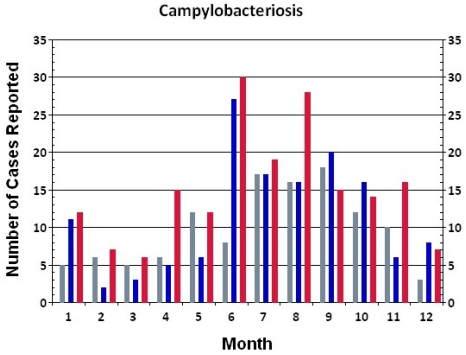
Invasive Streptococcal Disease

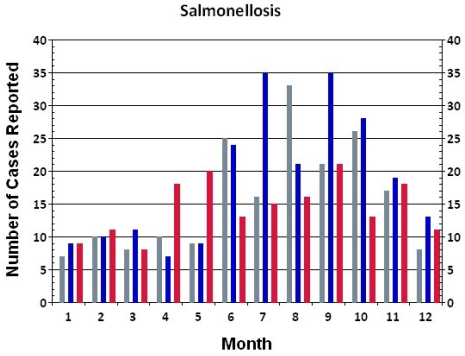


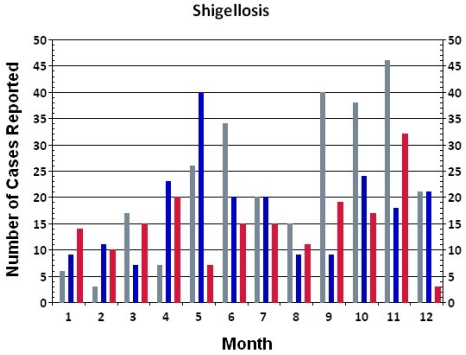




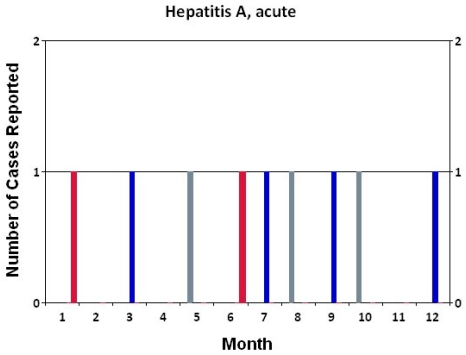
Gastrointestinal Disease

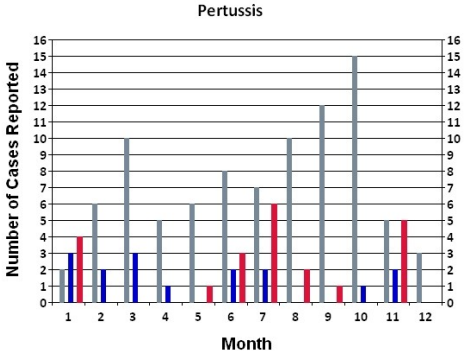


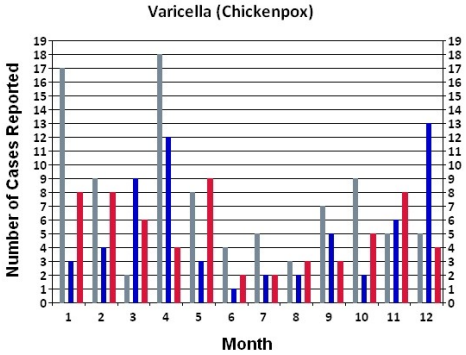




Vaccine Preventable Disease







The diagnosis of ehrlichiosis should be made on clinical signs and symptoms and confirmed later using specialized confirmatory laboratory tests, since detectable antibody titers are not observed until 7 to 10 days after illness onset. The incidence of ehrlichiosis in the United States in 2008 was 2.5 cases per million persons according to the CDC. There were 6 cases of disease reported to TX DSHS in 2011. The case fatality rate of this disease was 1.1% in 2010.

Lyme Disease

Lyme disease is caused by the spirochete *Borrelia burgdorferi* and transmitted by the bite of the blacklegged tick (*Ixodes scapularis*). The incubation period from tick bite until the appearance of single or multiple erythema migrans lesions ranges from 1 to 32 days, with a median of 11 days. In addition to the erythema migrans rash, other symptoms may include fatigue, chills, fever, headache, muscle and joint aches and swollen lymph nodes. If left untreated, the infection can spread to other sites of the body producing symptoms that include additional erythema migrans lesions on other areas of the body, facial or Bell's palsy, headaches or meningitis, pain and swelling in large joints, shooting pains, heart palpitations and dizziness. According to the CDC, 10 to 20% of patients with Lyme disease exhibit symptoms that last months to years after antibiotic treatment. There were 74 cases of Lyme disease reported to TX DSHS in 2011, with an incidence of 0.1 cases per 100,000 persons.

Erythema migrans rash, usually an indication of Lyme disease. Photo courtesy of CDC Public Health Image Library, #9874.

Relapsing fever

Tick-borne relapsing fever is a bacterial infection caused by certain types of the spirochete *Borrelia* species, namely *Borrelia hermsii* (most common), *Borrelia turicatae*, and *Borrelia parkeri*. The vectors are "soft ticks" that inflict a painless bite, feed very briefly (10 to 30 minutes) usually at night, and can be found in rodent-infested cabins or caves. The tick that causes relapsing fever is from genus *Ornithodoros,* which includes species *O. hermsi, O. turicata and O. parkeri.* The incubation period is 2 to 18 days with a mean of 7 days. This disease is characterized by a sudden onset of fever lasting several days, followed by a period without fever, then followed by another episode of fever. In addition to the fever, other symptoms may include shaking chills, sweats, headache, muscle and joint pain, nausea and rash. A macular rash on the trunk and petechiae of the skin and mucus membranes appears occasionally. Complications of this disease include iritis, uveitis, cranial nerve and other neuropathies. The case fatality rate for an untreated patient is 4 to 10 %. There were no cases reported in Texas over the last 10 years.

Spotted fever group rickettsioses

In Texas, the spotted fever group rickettsiosis (SFGR) category includes infections caused by the bacteria *Rickettsia rickettsii*, or Rocky Mountain spotted fever (RMSF), and *Rickettsia parkeri*. RMSF is spread to humans by the American dog tick (*Dermacentor variabilis*) and brown dog tick (*Rhipicephalus sanguineus*). The Gulf Coast tick (*Amblyomma maculatum*) spreads *R. parkeri*. The incubation period is usually 1 week with a range of 2 to 14 days. Symptoms may include fever, rash, headache, nausea, vomiting, abdominal pain, muscle pain, lack of appetite and conjunctival injection. Rash occurs 2 to 5 days after fever and starts on the wrists and ankles first and spreads to the trunk proximally. Rash may be absent or atypical in up to 10% of RMSF cases. Other SFGR illnesses may have a maculopapular or petechial rash or a distinctive eschar. Long term sequelae are common in cases of severe disease, which includes neurological deficits or damage to internal organs. Tests based on the detection of antibodies will be negative until 7 to 10 days after illness onset, so the diagnosis of RMSF must be made on clinical signs and symptoms and can later be confirmed by specialized confirmatory laboratory tests. The case fatality rate of RMSF is less than 0.5% for treated patients. According to the CDC, incidence of RMSF has increased from 2 cases per million persons in 2000 to 6 cases per million persons in 2010. In 2011, there were 52 cases of RMSF reported to TX DSHS.

Sources:

Centers for Disease Control and Prevention

Red Book (29th Edition)

Texas Department of State Health Services Epi Case Criteria Guide, 2013 http://www.dshs.state.tx.us/workarea/linkit.aspx?linkidentifier=id&itemid=24250

Texas Department of State Health Services, Zoonotic Diseases, Human Case Data, 2010 - 2019 http://www.dshs.state.tx.us/idcu/health/zoonosis/disease/2010/