

## RICKETTSIAL INFECTIONS

Rickettsial infections are caused by bacteria from the order Rickettsiales and genera *Rickettsia*, *Anaplasma*, *Ehrlichia*, *Neorickettsia*, *Neoehrlichia*, and *Orientia*. Illnesses fall into several main groups, including tickborne spotted fevers, murine (flea-borne) typhus, epidemic louse-borne typhus, mite-borne scrub typhus, and tickborne ehrlichiosis and anaplasmosis. The clinical presentation of rickettsioses varies by causative agent, but in most cases, early symptoms are non-specific and may include fever, headaches, myalgias, and sometimes rash.

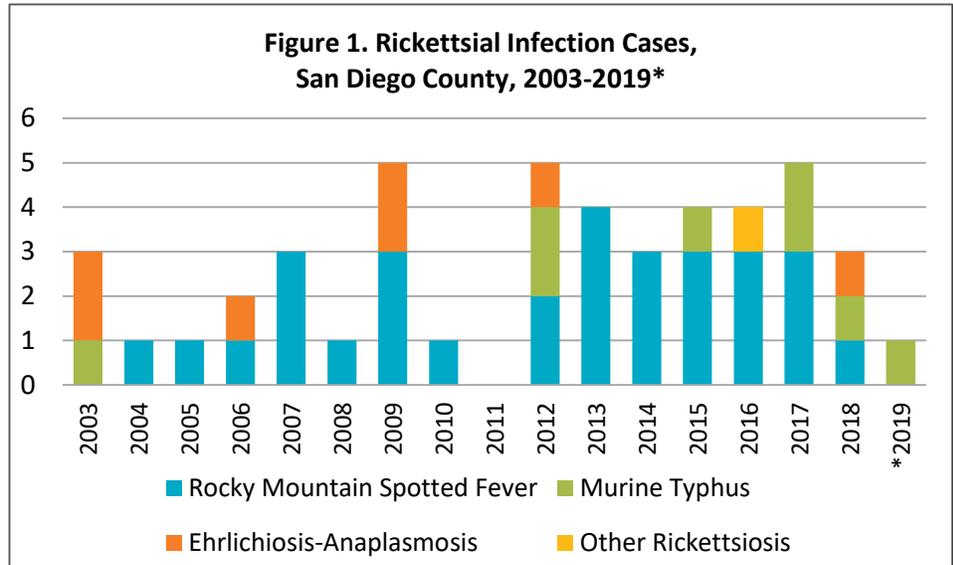
Rickettsial infections occur worldwide with geographic distribution also varying by causative agent. In the United States (U.S.), Rocky Mountain spotted fever and ehrlichiosis/anaplasmosis are the most common rickettsioses. In some areas, including southern California, murine typhus has been reported more frequently in recent years.

**Rocky Mountain spotted fever (RMSF)**, caused by *R. rickettsia*, is the most severe of the spotted fever rickettsioses in the U.S. Early symptoms of RMSF usually begin 2-14 days after the bite of an infected tick and include sudden onset of fever and headache. A characteristic petechial rash usually appears two to four days after the onset of fever, but up to 10% of cases have no rash. If not treated early with doxycycline, illness can progress within days to serious outcomes such as necrosis requiring amputation, multiorgan system damage, and death. Case fatality rates range from three to five percent with early treatment to more than 20% when untreated.

Early **diagnosis** of RMSF relies on symptoms and history or suspicion of a tick bite. Tick and animal exposures and travel histories should be obtained for patients with fever and rash or with a persistent fever of unclear origin. Treatment of suspected rickettsiosis should not be delayed while waiting for laboratory confirmation. Antibody titers are frequently negative within the first 7-10 days of illness. Cross-reactivity with other spotted fever rickettsias, such as *R. parkeri* and *R. philipii* 364D is also possible. No RMSF vaccine is available; the illness can be **prevented** by preventing tick bites, ticks on pets, and ticks in the yard. Species of ticks that transmit RMSF in the U.S. include the American dog tick, the Rocky Mountain wood tick, and the brown dog tick.

Nationally, incidence of spotted fever rickettsiosis has increased since it became notifiable in the 1920s, with a significant increase since the 1990s. Case fatalities have declined since tetracycline antibiotics became available in the 1940s. In 2017, there were 6,248 **reported** cases of spotted fever rickettsiosis in the U.S. Spotted fever rickettsiosis is less commonly reported in California, with 15 cases in 2017 and 14 in 2018. In San Diego County, three cases of RMSF were reported in 2017 and one in 2018. *Rickettsia* spp. are present in San Diego County;

*Continued on next page*



\*2019 data are year-to-date; current as of 11/15/2019. Data are provisional and subject to change as additional information becomes available. Grouped by CDC disease years.

The Monthly Communicable Disease Surveillance Report is a publication of the County of San Diego Public Health Services Epidemiology and Immunization Services Branch (EISB). EISB identifies, investigates, registers, and evaluates communicable, reportable, and emerging diseases and conditions to protect the health of the community. The purpose of this report is to present trends in communicable disease in San Diego County. To subscribe to this report, visit the [Statistics and Reports](#) page on the Epidemiology Program website ([www.sdepi.org](http://www.sdepi.org)) and click on the subscribe link.

## RICKETTSIAL INFECTIONS, continued

a [study](#) sampling ticks in San Diego County in 2014 found that 2.3% were infected with *R. philipphi* 364D.

In parts of northern Mexico, RMSF is a re-emerging disease transmitted by tick-infested dogs. In Baja California, 967 cases and 132 deaths were [identified](#) between 2009-2016. A recent [study](#) found that six percent of dogs sampled in Baja California carried ticks that were PCR-positive for *Rickettsia* spp.

Unlike the tickborne spotted fever rickettsias, [murine typhus](#), also known as flea-borne typhus, is spread to people through contact with infected fleas. Infection with *R. typhi*, and possibly *R. felis*, occurs when flea feces is rubbed into wounds, is breathed in, or is rubbed into eyes. Rats are the primary reservoir and the oriental rat flea has typically transmitted murine typhus to humans; however, six genera and seven species of flea, including the cat flea, have been found to be infected with *R. typhi* and, in urban and suburban areas, cats, dogs, and opossums have also been implicated as hosts.

Symptoms usually present one to two weeks after contact with infected fleas and may include fever and chills, body aches and muscle pains, loss of appetite, nausea and vomiting, stomach pains, and cough. A rash may be present as well, but normally occurs at least five days after illness onset. Most people recover completely, and severe illness is rare. Recovery can sometimes occur even when the infection is untreated; however, severe illness and

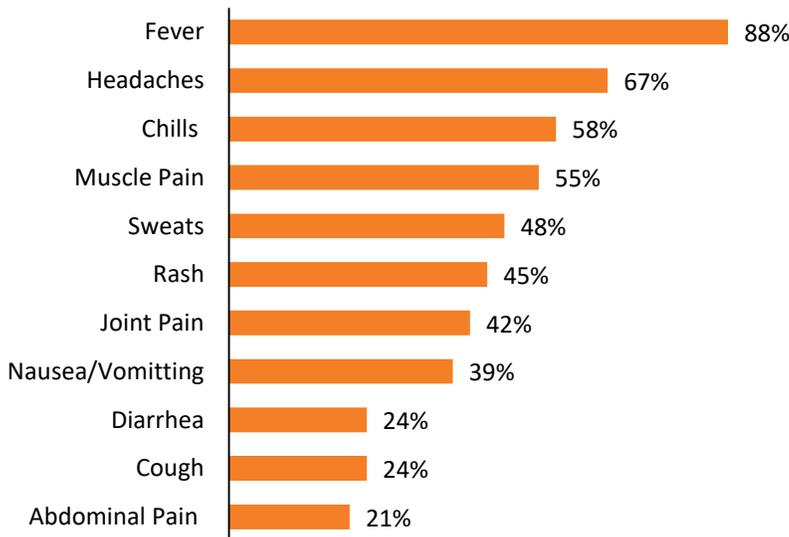
organ damage has been reported among untreated cases.

Collecting travel and flea and animal exposure histories may aid in the diagnosis of murine typhus. Treatment of suspected cases should not be delayed pending test results. No vaccine is available to prevent murine typhus, but treatment with antibiotics is effective. Illness can be prevented by avoiding contact with fleas, using flea control products on pets, and keeping rodents and animals away from homes, workplaces, and recreational areas.

Murine typhus is no longer nationally notifiable, but it remains a reportable condition in California. Most reported cases occur in California, Hawaii, and Texas.

Murine typhus is considered [endemic](#) in Southern California. The number of cases nearly doubled to 60 cases per year in Los Angeles County between 2013-2017. In 2018, an [outbreak](#) of murine typhus was identified in downtown Los Angeles, where eight of the 19 cases were experiencing homelessness or living in interim housing facilities. In San Diego, there have been eight reports of murine typhus since 2003, including some that were locally acquired.

**Figure 2. Reported Symptoms of Rickettsial Infection Cases, San Diego County, 2003-2019\* (N=33)**



\*2019 data are year-to-date; current as of 11/15/2019. Data are provisional and subject to change as additional information becomes available. Grouped by CDC disease years.

### Resources

- [Centers for Disease Control and Prevention \(CDC\) Ticks website](#)
- [Diagnosis and Management of Tickborne Rickettsial Diseases](#)
- [CDC Typhus Fever website](#)
- [California Department of Public Health \(CDPH\) Tickborne Diseases website](#)
- [CDPH Flea-borne Typhus website](#)
- [San Diego County Vector Control Program website](#)

# MONTHLY COMMUNICABLE DISEASE REPORT

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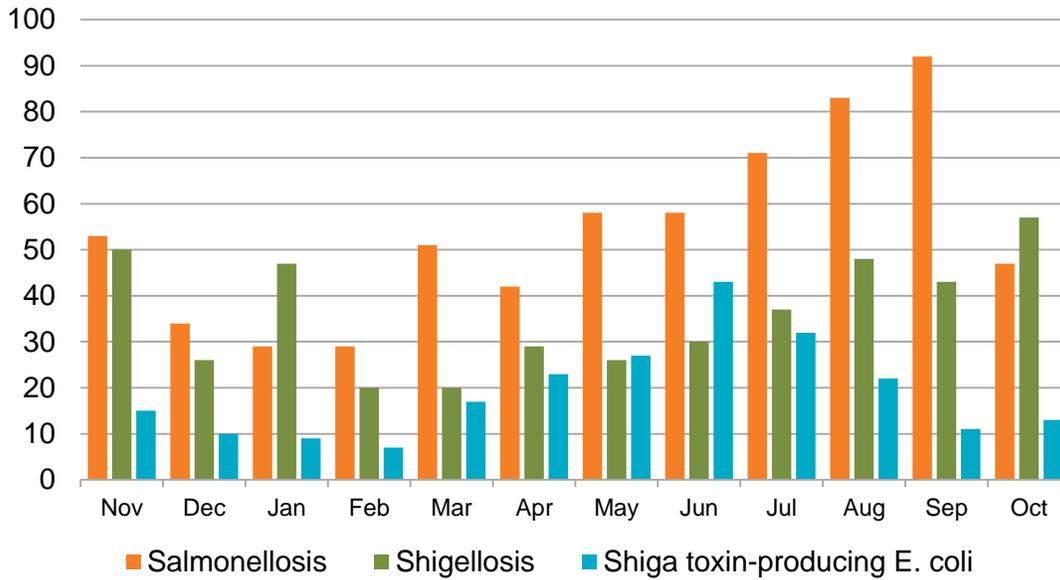


Table 1. Select Reportable Diseases		2019			Prior Years		
		Current Month	Prior Month	Year-to-Date (YTD)	2018 YTD	Avg YTD, Prior 3 Years	2018 Total
Disease and Case Inclusion Criteria (C,P,S)							
Amebiasis	C	0	0	7	8	7.0	10
Botulism (Foodborne, Infant, Wound, Other)	C,P	1	0	1	10	6.3	11
Brucellosis	C,P	0	0	1	2	3.7	2
Campylobacteriosis	C,P	75	97	871	724	729.7	828
Chickenpox, Hospitalization or Death	C,P	0	0	2	2	1.7	4
Chikungunya	C,P	0	1	3	5	4.0	5
Coccidioidomycosis	C	31	29	294	237	199.0	276
Cryptosporidiosis	C,P	12	12	85	78	51.0	90
Dengue Virus Infection	C,P	6	3	22	7	12.7	9
Encephalitis, All	C	1	6	34	48	51.3	66
Giardiasis	C,P	15	15	185	210	261.7	229
Hepatitis A, Acute	C	1	0	12	32	198.0	35
Hepatitis B, Acute	C	0	0	6	8	8.0	9
Hepatitis B, Chronic	C,P	68	90	774	723	726.0	867
Hepatitis C, Acute	C,P	1	2	45	2	2.0	2
Hepatitis C, Chronic	C,P	373	329	3,376	3,580	2,841.7	4,167
Legionellosis	C	3	6	47	40	46.3	54
Listeriosis	C	0	0	8	13	15.7	14
Lyme Disease	C,P	0	0	2	13	15.0	14
Malaria	C	0	1	6	6	7.3	8
Measles (Rubeola)	C	0	0	2	0	0.7	0
Meningitis, Aseptic/Viral	C,P,S	17	28	158	125	131.3	140
Meningitis, Bacterial	C,P,S	2	2	25	33	36.3	37
Meningitis, Other/Unknown	C	0	1	16	13	23.3	17
Meningococcal Disease	C,P	0	0	6	11	4.7	11
Mumps	C,P	12	4	53	9	14.3	9
Pertussis	C,P,S	55	67	592	566	596.0	656
Rabies, Animal	C	1	0	7	7	9.7	7
Rocky Mountain Spotted Fever	C,P	0	0	0	1	1.7	1
Salmonellosis (Non-Typhoid/Non-Paratyphoid)	C,P	47	92	560	704	544.0	787
Shiga toxin-Producing <i>E. coli</i> (including O157)	C,P	13	11	204	149	151.3	174
Shigellosis	C,P	57	43	357	317	261.0	391
Typhoid Fever	C,P	1	0	7	2	2.0	4
Vibriosis	C,P	5	5	50	53	42.7	58
West Nile Virus Infection	C,P	0	0	3	1	8.3	2
Yersiniosis	C,P	4	2	43	20	26.0	26
Zika Virus	C,P	1	1	6	7	32.3	7

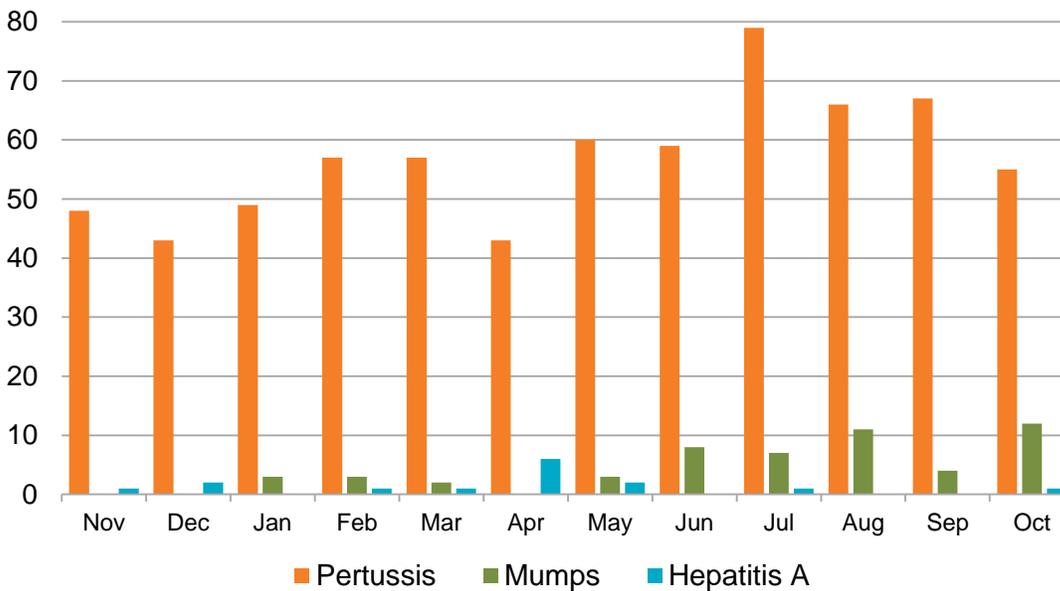
**Case counts are provisional and subject to change as additional information becomes available.** Cases are grouped into calendar months and calendar years on the basis of the earliest of the following dates: onset, lab specimen collection, diagnosis, death, and report received. Counts may differ from previously or subsequently reported counts due to differences in inclusion or grouping criteria, late reporting, or updated case information. Inclusion criteria (C,P,S = Confirmed, Probable, Suspect) based on Council of State and Territorial Epidemiologists/Centers for Disease Control and Prevention (CSTE/CDC) surveillance case criteria.



**Figure 3. Select Enteric Infections by Month  
November 2018 – October 2019**

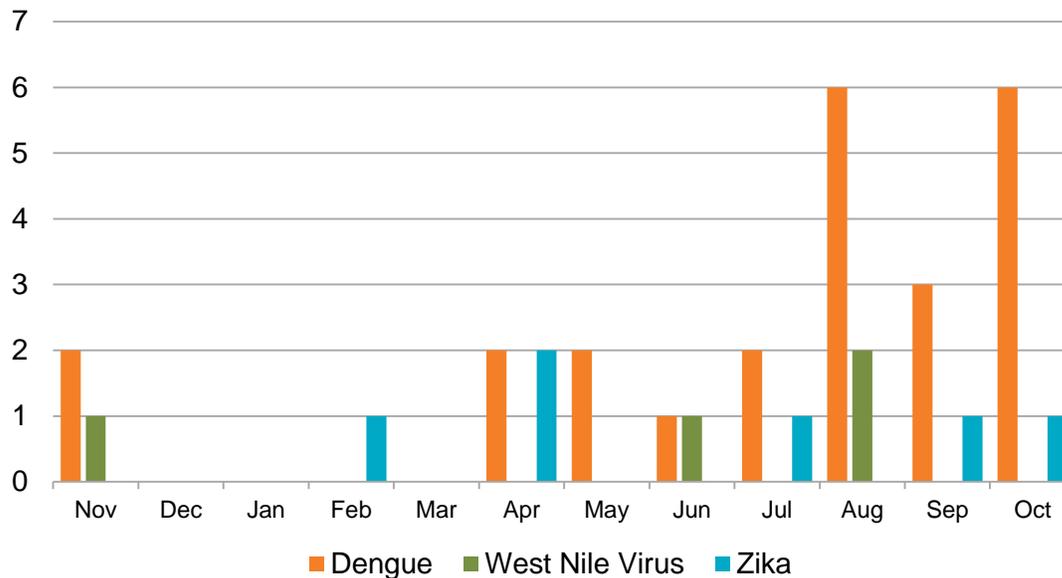


**Figure 4. Select Vaccine-Preventable Infections by Month  
November 2018 – October 2019**



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**Figure 5. Select Vector-Borne Infections by Month  
November 2018 – October 2019**



All of the dengue and Zika virus cases are travel-associated. For additional information on Zika cases, see the [HHSa Zika Virus webpage](#). For more information on West Nile virus, see the [County West Nile virus webpage](#). **Case counts are provisional and subject to change as additional information becomes available.** Cases are grouped into calendar months and calendar years on the basis of the earliest of the following dates: onset, lab specimen collection, diagnosis, death, and report received. Counts may differ from previously or subsequently reported counts due to differences in inclusion or grouping criteria, late reporting, or updated case information. Inclusion criteria (C,P,S = Confirmed, Probable, Suspect) based on Council of State and Territorial Epidemiologists/Centers for Disease Control and Prevention (CSTE/CDC) surveillance case criteria.

### Disease Reporting in San Diego County

San Diego County communicable disease surveillance is a collaborative effort among Public Health Services, hospitals, medical providers, laboratories, and the [San Diego Health Connect](#) Health Information Exchange (HIE). The data presented in this report are the result of this effort.

Reporting is crucial for disease surveillance and detection of disease outbreaks. Under the California Code of Regulations, Title 17 (Sections [2500](#), [2505](#), and [2508](#)), public health professionals, medical providers, laboratories, schools, and others are mandated to report more than 80 diseases or conditions to San Diego County Health and Human Services Agency.

To report a communicable disease, contact the Epidemiology Program by phone at (619) 692-8499 or download and print a Confidential Morbidity Report form and fax it to (858) 715-6458. For urgent matters on evenings, weekends or holidays, dial (858) 565-5255 and ask for the Epidemiology Program duty officer. For more information, including a complete list of reportable diseases and conditions in California, visit the Epidemiology Program website, [www.sdepi.org](http://www.sdepi.org).

Tuberculosis, sexually transmitted infections, and HIV disease are covered by other programs within Public Health Services. For information about reporting and data related to these conditions, search for the relevant program on the Public Health Services website, <http://www.sandiegocounty.gov/content/sdc/hhsa/programs/phs.html>.