

Murine Typhus

Murine Typhus is not currently a reportable disease in Louisiana.

Epidemiology

Rickettsia typhi or *Rickettsia felis*, bacteria spread to humans by the bite of fleas, are the etiologic agents of murine typhus. *R. felis* is a relatively recent discovery, but has been implicated in murine typhus cases in Texas and California. *R. typhi* is spread through the flea *Xenopsylla cheopis*, and *R. felis* is typically spread through the cat flea, *Ctenocephalides felis*. The common hosts for *X. cheopis* are the black rat or roof rat (*Rattus rattus*), and Norway or wharf rat (*Rattus norvegicus*), although it has been found in many other rodent species. Common hosts for *C. felis* are domestic and feral cats, opossums, and domestic dogs. The opossum has been particularly implicated as a host for cat fleas in serological studies in California. Although fleas are the vector for murine typhus, in many cases patients cannot recall a history of flea exposure or bites.

Murine typhus used to be common in the United States, but was almost entirely eradicated in public health campaigns in the 1940s. In 1945, there were as many as 423 cases in Louisiana. That number dropped until only two cases were seen in the time period from 1960 to 1969. There were approximately three cases diagnosed in the 1970s, none in the 1980s, and one in the 1990s. Since 2010, however, there have been seven cases, although none have been confirmed. The disease remains common worldwide, especially in developing and coastal cities. Sporadic outbreaks do occur elsewhere in the United States, mainly in California, Texas, and Hawaii.

After an incubation period of six to 14 days (average time: 12 days), an acute, nonspecific, febrile illness develops. Most cases also report some combination of headache, chills, arthralgia, and myalgia, and some report rash. The rash normally erupts on the upper trunk and spreads outward, usually excluding the face, soles of the feet, and palms. Laboratory abnormalities that have been reported include anemia, leukopenia, thrombocytopenia, or elevation of hepatic transaminases. Due to its general symptoms, murine typhus frequently goes unrecognized, or is confused with other diseases.

The mortality rate for murine typhus with appropriate antibiotic use is less than 1%. Without treatment, however, the disease becomes more severe, and potential for complications increase. Because it may take up to 10 days for antibodies to become detectable by laboratories, antibiotic therapy should be administered upon suspicion of a rickettsial infection. The disease is normally less severe in children. Risk factors include advanced age and immunocompromised status.

Laboratory confirmation is usually done by serology. Several well validated serologic assays are available, but the reference standard is indirect immuno-fluorescence assay (IFA). It is necessary to obtain two samples, one during the acute phase of the illness and one during the convalescent phase, which must show at least a four-fold increase in antibody titers. PCR and isolation of the organism from tissues are other means of diagnosis. The difficulty of obtaining these laboratory results for a relatively mild illness may help explain why many cases go unreported or unconfirmed.

No licensed vaccine providing immunity to murine typhus is available. Limiting exposure to fleas is an important method of prevention. Since elimination of all activities resulting in flea exposure is impossible, it is important to take protective measures such as wearing insect repellent containing DEET, wearing heavy, long-sleeved clothing in flea infested areas, treating domestic pets with flea prevention, and eliminating habitat for rodents, opossums, and other mammals that host fleas.

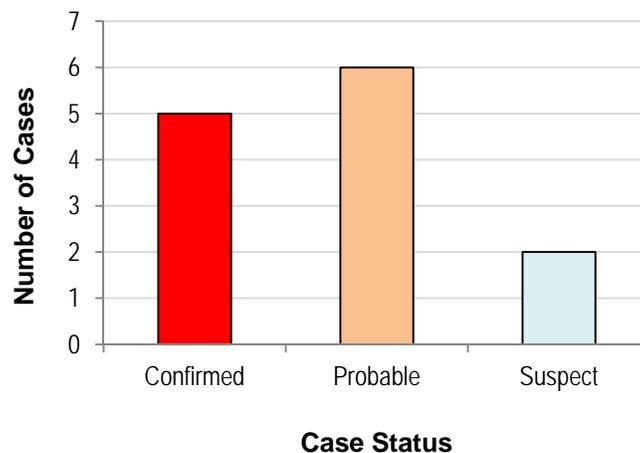
Cases

Although descriptive statistics are presented, they should be interpreted with caution given the extremely small numbers reported.

Since 1958, there have been 13 cases, including suspected and probable cases. In Louisiana, for the years between 2010 to 2014, there have been no confirmed cases, five probable cases, and two suspected cases. Of the cases reported since 2010, most (71.4%) were reported in 2014. The recent increase since 2010 may be due to increasingly sensitive laboratory techniques, rather than an actual increase in disease rate. In addition, these relatively low case numbers may not accurately reflect the burden of disease, but may rather result from the fact that the disease is relatively mild, so many providers may not run lab results, or may fail to follow up in order to obtain convalescent titers. A final factor which may influence case reporting may be due to providers' increased awareness of the more severe rickettsial disease, Rocky Mountain Spotted Fever. The early stages of murine typhus and Rocky Mountain Spotted Fever are clinically similar, so the increase in reports may be due to laboratory testing done to diagnose RMSF. Further surveillance will be needed to distinguish between these factors and determine the true rate of disease.

Note: Not all data represents total case numbers; in some instances, demographics are unknown

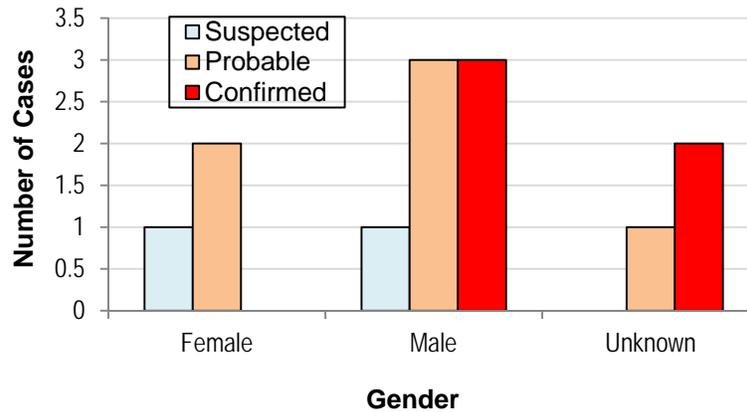
Figure 1: Murine typhus cases by case status: Louisiana, 1968-2014.



Gender and Age

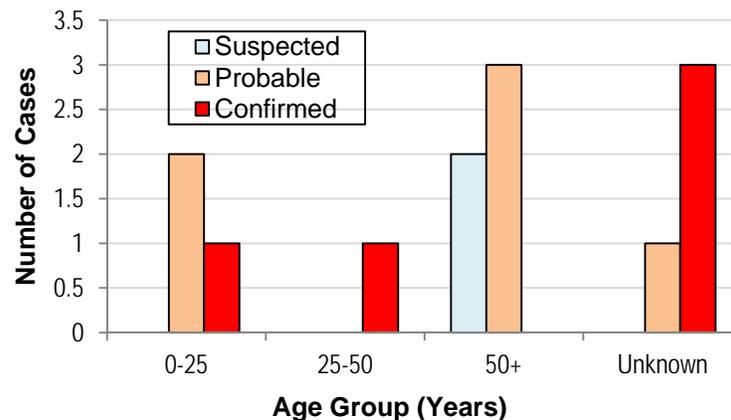
In cases where the gender was known, 70% were male (Figure 2).

Figure 2: Murine typhus cases by gender and case status: Louisiana, 1968-2014.



Where the age was known, most cases (55%) were older than 50 years of age. In cases occurring since 2010, 71.4% were older than 50 years, and 28.6% were 25 years of age or younger (Figure 3).

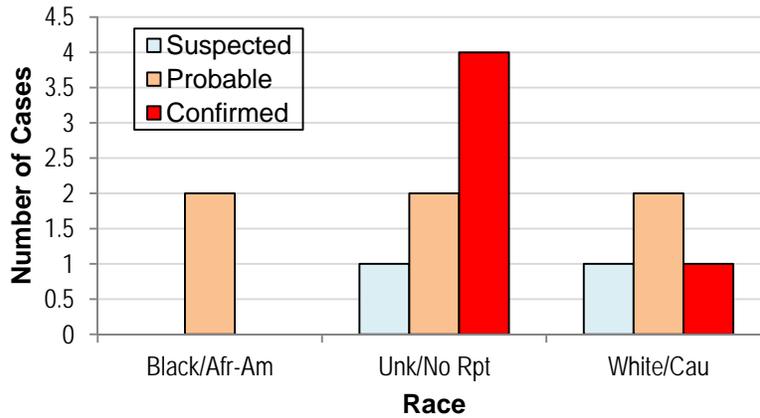
Figure 3: Age distribution and case status of murine typhus cases: Louisiana, 1968-2014.



Race

In Louisiana, 29% of cases were Black/African-American, 43% were White/Caucasian, and 29% were Unknown/Chose not to report a racial category (Figure 4).

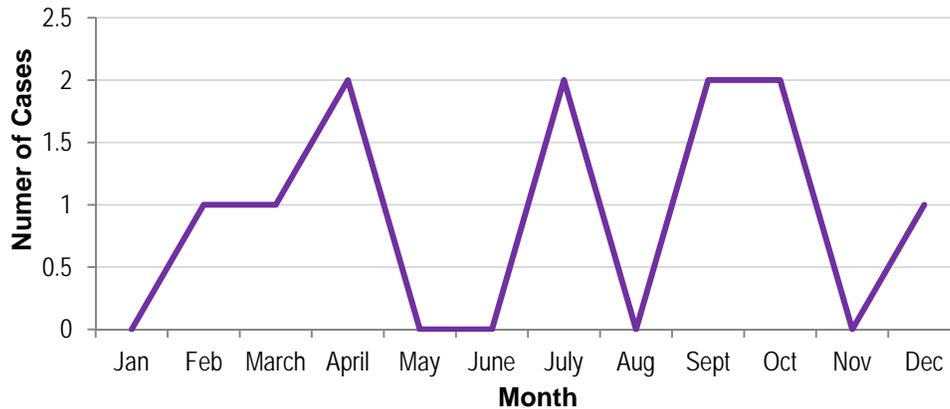
Figure 4: Probable and suspected murine typhus cases by race: Louisiana, 1968-2014.



Seasonality

There is great variation in terms of seasonality for murine typhus. Fleas prefer a hot climate; therefore, murine typhus often appears seasonally, but can be year-round when temperatures remain warm enough to support flea activity (Figure 5).

Figure 5: Monthly distribution of cases of murine typhus: Louisiana, 1968-2014.



Louisiana’s cases appear to be clustered in spring (late February-April) and fall (September-October), with a spike in mid-summer. More data is needed to validate this trend, however, especially since it differs from the reported trends of neighboring Texas, which reports cases most frequently in April through June.

Geography

Of cases where the parish of residence is known, the majority (63.6 %) of case reports came from Region 7. This region is adjacent to Texas, which is considered endemic for murine typhus (Figure 6).

Figure 6: Murine typhus cases by region and case status: Louisiana, 1968-2014

