

Novel *Leptospira* strain that can infect humans

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Rats are believed to be one of the main carriers of leptospirosis. Credit: Michael Palmer (CC BY-SA 4.0)

Malaysian researchers have identified the two species of the *Leptospira* genus of bacteria responsible for most cases of leptospirosis in the country and discovered a new strain capable of infecting humans.

Humans, infected with leptospirosis by wild or [domestic animals](#)

—including rats, racoons, pigs, cats and dogs—can be asymptomatic or experience fevers, meningitis, multiorgan failure and death. The zoonotic [disease](#) (pathogens that normally infect animals but can be transmitted to humans) is most common in tropical and subtropical regions with more than a million cases of leptospirosis annually, of which 60,000 turn fatal.

The genus *Leptospira* contains 64 species isolated from humans, animals and environments and the study identified *L. interrogans*, *L. kirschneri*, and *L. wolffii* as the main human-infecting species in Malaysia. Of these, the first two were found responsible for most cases leptospirosis in central Malaysia.

The study also identifies novel, clinically important *L.interrogans* strains, underscoring the importance of characterizing more human-infecting strains and searching for the potential animal reservoirs, says Vasantha Kumari Neela, a professor in the Department of Medical Microbiology and Parasitology, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, who led the research team.

Initially, the researchers attempted to determine why only certain patients develop serious illness, identify biomarkers to predict cases that may lead to severe illness and understand the molecular epidemiology of circulating strains from animal, human and environmental sources. They also attempted to evaluate existing diagnostic tests and develop new tests. Presently, the disease is difficult to clinically diagnose due to overlapping signs and symptoms with other diseases such as dengue and typhus, leading to delays in appropriate treatment.

The researchers confined their study, published in *PLoS Neglected Tropical Diseases*, to rodents and small mammals. According to Neela, cases of leptospirosis in humans often are associated with activity in recreational forests, during floods, and exposure to rodent urine.

"We don't provide leptospirosis vaccination in Malaysia, but prophylaxis is given to [high-risk groups](#), like those going for military training," she says.

The work identifies potential sources of infecting strains, risk factors for leptospirosis in Malaysia, clinical symptoms and identification of new sequence types that is different from animals. "This research also raises the question that rodents may not be the main source of transmission," she says.

Kamruddin Ahmed, a professor in the Department of Pathobiology and Medical Diagnostics and director of the Borneo Medical and Health Research Centre, emphasizes that leptospirosis is a challenge not only for Malaysia but also for other parts of the world where the burden of this disease is high.

"There is no user-friendly, reliable, and economic diagnostics for the disease. Furthermore, [clinical diagnosis](#) is disappointing as the signs and symptoms of leptospirosis vary considerably with the result that many cases go unnoticed and mortality becomes high," says Ahmed, adding that there is a need to better understand the microorganism.

The new study is important because it determines that while *L. interrogans* and *L. kirschneri* are the predominant species causing human leptospirosis in Central Malaysia, it also shows regional differences regarding the distribution of these two species, Ahmed tells SciDev.Net.

"Similar research in other areas should be performed to reveal the exact epidemiology of *Leptospira*. This will certainly lead to better diagnosis, vaccine development, and formulation of informed policy to prevent leptospirosis."

Thong Kwai Lin, professor at the Institute of Biological Sciences,

University of Malaya, Malaysia, stresses that there is need for a "robust surveillance system to monitor temporal and spatial changes in incidence and prevalence in order to identify risk areas and risk behavior and, in turn, design adequate control and prevention measures."

Lin emphasizes that leptospirosis is an endemic disease in Malaysia with a dramatic increase in reported cases over the last decade. She says this study shows that "there is a need of collaborative efforts among medical, academic, and governmental institutions for the construction of a comprehensive database that is essential to understand the disease trends in Malaysia and add insights into the prevention and control of this disease."

More information: Noraini Philip et al. *Leptospira interrogans* and *Leptospira kirschneri* are the dominant *Leptospira* species causing human leptospirosis in Central Malaysia, *PLOS Neglected Tropical Diseases* (2020). [DOI: 10.1371/journal.pntd.0008197](https://doi.org/10.1371/journal.pntd.0008197)

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