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Global burden of leptospirosis is greater than thought, and growing

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The global burden of a tropical disease known as leptospirosis is far greater than previously estimated, resulting in more than 1 million new infections and nearly 59,000 deaths annually, a new international study led by the Yale School of Public Health has found.

Professor Albert Ko, M.D., and colleagues conducted a systematic review of published morbidity and mortality studies and databases, and for the first time developed a disease model to generate a worldwide estimate of leptospirosis' human toll. The results were published Sept. 17 in *PLOS Neglected Tropical Diseases*.

While leptospirosis is relatively unknown in the developed world, it is a growing scourge in resource-poor settings throughout Latin America, Africa, Asia, and island nations. The spirochetal bacteria that causes the disease is shed in the urine of rats and other mammals. The pathogen survives in water and soil and infects humans upon contact through abrasions in the skin.

The finding shows leptospirosis is one of the leading zoonotic (diseases passed between animals and humans) causes of morbidity and mortality in the world and is a call to action, said Ko, chair of the Department of Epidemiology (microbial disease) at Yale School of Public Health.

"The study identified an important health burden caused by this life-threatening disease, which has been long neglected because it occurs in the poorest segments of the world's population," said Ko, who has

studied the disease for years in Brazil's urban slum communities, or favelas. "At present, there are no effective control measures for leptospirosis. The study provides national and international decision-makers with the evidence to invest in initiatives aimed at preventing the disease, such as development of new vaccines, as well as targeting the underlying environmental and social conditions, rooted in social inequity, that lead to its transmission."

The researchers said that the incidence of the disease has the potential to grow even further in the coming decades due to global climate change and rapid urbanization. The disease is particularly prevalent in urban slums where inadequate sewerage and sanitation, combined with extreme climatic events and heavy seasonal rainfall, enhance contact with contaminated environments, causing epidemics. It is estimated that the world's slum population will double to 2 billion people by 2030.

Leptospirosis results in severe illness and has emerged as an important cause of pulmonary hemorrhage and acute renal failure in developing countries, where death occurs in 10% of patients, and hemorrhaging occurs in up to 70%.

It is likely that the latest numbers still underestimate the problem, the researchers noted, as leptospirosis patients are frequently misdiagnosed with malaria, dengue, or other illnesses. There is also not an adequate diagnostic test for the disease.

Prior inconclusive estimates of the leptospirosis burden have contributed to its status as a neglected tropical disease and hampered efforts to develop effective prevention and control measures, the researchers said.

Provided by Yale University