

# Detection of pathogenic *Leptospira* bacteria in the airport environment using polymerase Chain reaction

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## ABSTRACT

Leptospirosis, caused by *Leptospira*, is a disease infecting human through direct contact with the contaminated urine from the animal, including rats. This disease is mainly transmitted to humans from rats living in poor hygiene environment. This study aimed to investigate the presence of pathogenic *Leptospira* in rats' kidney. This was a cross-sectional study conducted in February 2019. A total of 11 rats were caught from Sultan Hasanuddin International Airport, Indonesia. *Leptospira* bacteria was observed using the polymerase chain reaction (PCR). The environmental indicator measured was the amount of water presented in the mousetraps. We installed 100 mousetraps and trapped 11 rats. 54.5% of them were infected by leptospirosis bacteria. Among those six rats, 33% of cages presented water inside. In conclusion, more than half of rats living at the Hasanuddin airport were contaminated by *Leptospira* and indicated that the means of transmission are through the sewage of the airport.

**Key words :** *Leptospirosis, Pathogenic leptospira bacteria, Polymerase chain reaction, Poor environment*

## Introduction

Leptospirosis is a zoonotic disease that infects humans through direct contact with the urine of infected animals or with urine-contaminated environments. It occurs in vulnerable populations in countries with a subtropical or a humid tropical climate and has epidemic potential. In the early stages, the disease causes symptoms including high fever, severe headache, muscle aches, chills, redness of the eyes, stomach ache, jaundice, bleeding in the skin and mucous membranes, vomiting, diarrhea, and rashes (Agampodi *et al.*, 2010).

The presence of *Leptospira* bacteria, which can infect rats, is influenced by the abiotic and biotic environment. Abiotic environmental factors include

rainfall index, air temperature, water temperature, air humidity, light intensity, water pH, and soil pH. Biotic environmental factors include vegetation, successful catches, rat density, and *Leptospira* prevalence in rats (Nugroho, 2015). In a warm and humid environment with temperatures of 28-30 °C and a water and soil pH 7.2-8.0, *Leptospira* can survive more than 3 weeks without a host. However, at a neutral pH *Leptospira* can survive even longer in floodwaters. Poor sanitary conditions, such as uncollected waste accumulations and the presence of rats are determining variables in the case of leptospirosis. Leptospirosis has a worldwide distribution, with a higher incidence in tropical climates, especially after heavy rains or floods due to storms. In tropical countries, the incidence of leptospirosis

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