

# ISOPH 2017

Surabaya, Indonesia  
November 11-12, 2017

## PROCEEDINGS OF THE 2ND INTERNATIONAL SYMPOSIUM OF PUBLIC HEALTH

# Achieving SDGs in South East Asia: Challenging and Tackling of Tropical Health Problems

### Editors:

I Wayan Gede Artawan Eka Putra  
Agung Dwi Laksono  
Yulis Setiya Dewi  
Nikmatur Rohmah and  
Darrimiya Hidayati

Organized by  
Faculty of Public Health, Universitas Airlangga



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# FOREWORD

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The point of Sustainable Development Goals (SDGs) has been determined in the consistent meeting in all countries. The health sector position is one of the key components in achieving the indicators. Special attention to the health sector focuses on community nutrition, national health systems, access to reproductive health and family planning and sanitation and clean water.

Based on that, Southeast Asian countries are seen as important part in formulating strategic and policy efforts to improve the effectiveness and efficiency of achieving the various goals of the SDGs. Therefore, the Doctoral Program of Health Science, Faculty of Public Health, Universitas Airlangga held The 2nd International Symposium of Public Health. This remarkable event is in collaboration with Faculty of Medicine, Widya Mandala Catholic University Surabaya and Magister Program of Public Health, Jember University. It's an honour to present **“Achieving SDGs in South East Asia: Challenging and Tackling of Tropical Health Problems”**.

We have tried to give our best contributing of our knowledge in the field of public health especially our contribution to help the problems on tropical health, health equity and quality of health care, clinical and community relationship to enhance public health, emerging and re-emerging diseases, nutrition-enhancing as strategic investment, global strategy framework for food security and nutrition, environmental and occupational health and mental health for achieving SDGs in South East Asia.

The aim of this symposium is to disseminate knowledge and share it to the public, especially in the scientific community, such as academics and practitioners in the field of health. The symposium focusing on formulation of policy recommendations for related parties to accelerate the achievement of the target of SDGs in the field of health. The results of this symposium are also expected to be an input for policy makers, from various levels in formulating programs to accelerate the SDGs goals' achievement. This international symposium will help us, to grasp and share more knowledge especially in public health science.

At last, we would like to acknowledge for all parties which are provide the valuable materials as well as financial support for the successful symposium. As chair of organizing committee, I would also like to say deep thank you for all committees; my colleagues, and also students in faculty of Public Health Universitas Airlangga, who have been working to be part of a solid team and amazing committee.

I am looking forward to seeing you at ISoPH in the near future.

Rachmad Suhandu  
Chairman of the Committee



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# Evaluation of an Epidemiologic Investigation and Risk Factors Study of Leptospirosis Disease

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**Keywords:** Leptospirosis, outbreaks, farmers, icteric.

**Abstract:** On February 7th, 2017, the Pacitan District Health Office received a report of four suspected leptospirosis cases and one death. Epidemiological investigations were conducted to find additional cases and determine if leptospirosis occurred in Pacitan. The method of this study was descriptive study. The result of this study was that 47 cases were identified, spreading across ten districts with CFR = 25.53%. Of 47 cases, 31 were RDT- positive. Most of the case were males (74.5%) and 72.1% were farmers. The most common symptoms were: fever (83%), malaise (31.9%), icteric (23.4%) and conjunctival suffocation (19.1%). The majority of cases were found in 3 subdistricts; 19 cases in Tulakan, 8 cases in Kebongagung and 7 cases in Punung. The epidemic curve showed the outbreak was a propagated source. There was a leptospirosis outbreak in Pacitan District on February 2017. Rice farmers were the most affected population. We recommended that the District Health Office provides information regarding leptospirosis and its prevention.

## 1 INTRODUCTION

Leptospirosis is a zoonotic disease, caused by *Leptospira* sp. which can be transmitted from animal to human (Nurbekti, et al., 2016). *Leptospira* lasts for a long time in the animal's kidneys so that bacteria will be released by animals through urine. Leptospirosis in animals can occur for months, while in humans, it only lasts for 60 days. The human is the last host so human transmission is rare (Priyanto A, 2008).

In Indonesia, leptospirosis is mainly spread by rats that release bacteria through urine into the environment. Humans are infected through injured skin or mucous membranes. 90% of leptospirosis cases had symptoms of fever, headache and muscle aches. The remaining 10% were accompanied by kidney failure, jaundice, and bleeding (Murtiningsih B, et al., 2005).

Leptospirosis remains as a threat to Indonesian people's health because it is associated with the presence of risk factors; the high population of rats as leptospirosis hosts and poor environmental sanitation (Febrian, 2013). Some of the problems in leptospirosis prevention activities are the late

informing of some leptospirosis cases to health services, the low sensitivity of basic health care providers in diagnosing leptospirosis, and leptospirosis surveillance that is not well conducted (Ministry of Health Republic of RI, 2014).

## 2 METHOD

The approach used in this research is a descriptive approach. The activity begins with coordination with the Pacitan District Health Office, then we conduct field visits and seeks for additional cases. We analyze secondary data, and then perform data validation and analyze validated data.

## 3 RESULTS

The description of risk factors based on the environmental assessment of the Pacitan district geographical condition where there are mostly rice fields and mountains. Many signs of rat existence were found around the rice fields areas in the form

of rats' lairs (holes). The rice fields are mostly waterlogged. Most farmers in the rice fields do not use PPE (boots, gloves, etc.). Efforts made in the case of outbreaks of leptospirosis in Pacitan Regency are as follows:

### 3.1 Case Finding

The case finding was conducted through Early Warning and Response Systems (SKDR). To improve the sensitivity of SKDR in detecting and responding rapidly, Pacitan DHO performs the following steps:

- Improving the ability of medical personnel and paramedics;
- Surveillance in diagnosing leptospirosis clinically and using RDT;
- Broadcasting to the community about leptospirosis and its treatment;
- Advocating to stakeholders for political support and funding to treat Leptospirosis Outbreaks;
- Conducting epidemiological investigation to identify the characteristics of outbreaks and to identify the source of transmission and risk factors;
- Coordinating the prevention efforts with Pacitan General Hospital and Department of Agriculture;
- Coordinating with East Java Provincial Health Office in providing RDT for Leptospirosis diagnosis at Public Health Center and Hospital level.

### 3.2 Response Efforts

The prevention carried out by the Pacitan District Health Office is treatment with doxycyclin, providing diagnostic aids in the form of RDT, and instructing the Public Health Center that cannot handle leptospirosis cases to be referred at Pacitan General Hospital. Each suspected case of leptospirosis will be examined by a Public Health Center doctor and an RDT examination is performed. A case with positive RDT will be given 200mg of doxycyclin in a single dose. Leptospirosis patients with jaundice are referred to the hospital for further treatment.

The actions that has been taken by Pacitan DHO in response are:

- Increasing early warning system by surveillance in the form of investigation and tracking of all cases;

- Coordinating with Pacitan General Hospital as the referral hospital for handling leptospirosis cases in Pacitan;
- Making awareness circles at subdistricts and Public Health Center level, improving personal hygiene and environmental sanitation;
- Immediate reporting of leptospirosis cases to the health service.

### 3.3 Prevention Efforts

Some efforts that have been made by Pacitan DHO in prevention of leptospirosis cases are:

- reducing rat population by doing "gerobyokan tikus";
- educating the community about the leptospirosis disease;
- improving personal hygiene and environmental sanitation, which includes wearing PPE when doing a Leptospirosis high risk activity;
- advising potential victims to immediately visit health services in the case of feeling sick.

## 4 DISCUSSION

The incidence of leptospirosis cases occurring in the Pacitan District from December 2016 to April 2017 amounted to 47 cases and 12 deaths (CFR: 25.53%). The symptoms are fever, myalgia, malaise, conjunctival suffusion, calf pain, jaundice, anuria, cardiac arrhythmias and skin rashes. The source of transmission that was suspected of spreading leptospira bacteria was the population of rats.

Table 1: Total cases of leptospirosis and resulting RDT, Pacitan, from 2016 –April 2017.

Sub district	Reported	Pos	Neg	Not examined
Arjosari	4	4	0	0
Donorojo	1	1	0	0
Kebonagung	8	4	0	4
Ngadirojo	1	1	0	0
Pringkuku	4	2	1	1
Punung	7	2	2	3
Sudimoro	2	2	0	0
Tegalombo	1	1	0	0
Tulakan	19	14	0	5
TOTAL	47	31	3	13

During the period from January to April 2017, a total of 47 suspected leptospirosis cases was

reported by the Public Health Center and 34 cases were examined with RDT. The reported cases spread across 10 subdistricts from a total of 12 subdistricts in Pacitan. The results of the examination with RDT showed 31 cases (91.2%) positive for leptospire. From 13 unexamined cases, 12 cases could be categorized as leptospirosis as they had the same clinical symptoms as other leptospirosis cases, whereas 1 case referred to Pacitan General Hospital was diagnosed with Dengue Fever. Thus, from 47 cases reported, only 43 cases could be defined as leptospirosis patients. Further analysis was only performed on the 43 cases of leptospirosis.

Leptospirosis cases in the Pacitan district mostly happened to males (74.5%) with the age group of 25-64 years (77%). This is because most of the workers in rice fields were male and at productive ages. In infants and children, leptospirosis rarely occurs because of infrequent exposure to leptospira bacteria.

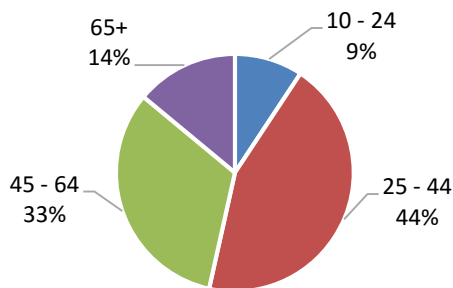


Figure 2: Distribution of leptospirosis cases by age group in Pacitan district, Dec 2016 - April 2017.

Of 12 subdistricts in the Pacitan District, 9 subdistricts reported Leptospirosis cases and the 3 subdistricts that did not report any cases of

leptospirosis were Pacitan subdistrict, Nawangan subdistrict and Bandar subdistrict (Pacitan district Health Officer, 2017). The highest number of leptospirosis cases was reported in the Tulakan subdistrict which amounted to 18 cases (42%). The high number of leptospirosis cases in Tulakan subdistrict compared to others, was caused by the intensive detection and diagnosis activities conducted by the Tulakan Public Health Center.

From the environmental observations, many holes / hiding places of rats were found in the rice fields area indicating the existence of rat populations. As the rice fields were always in damp conditions, this allows the rat to contaminate the area with leptospira bacteria. This finding is in line with research by Murtini (2003) that rice fields or matters related to rice fields are a risk factor for Leptospirosis cases. Most farmers in the rice fields do not use PPE (boots, gloves, etc.) a risk factor for leptospirosis. This finding is in line with research by Sri Rejeki (2013) that the use personal protective equipment a risk factor for leptospirosis.

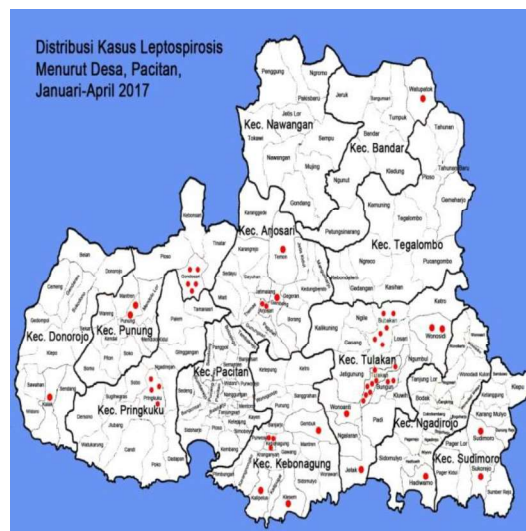


Figure 2: Distribution of leptospirosis cases by age group in the Pacitan district, Dec 2016 - April 2017.

Table 2: Number of cases, AR in CFR of leptospirosis by subdistrict in Pacitan, December 2016 – April 2017.

Sub district	Population	Number of case	AR (%)	Death	CFR (%)
Arjosari	37,966	4	0.01	1	25
Bandar	42,361	1	0.002	0	0
Donorojo	37,453	1	0.003	0	0
Kebonagung	41,757	8	0.02	2	25
Ngadirojo	45,145	1	0.002	0	0
Pringkuku	29,369	3	0.012	1	33
Punung	34,485	5	0.014	2	40
Sudimoro	2,654	2	0.08	1	50
Tulakan	9,929	18	0.2	3	16.7
TOTAL	281,119	43	0.02	10	23.3

In the Pacitan district, the average CFR of leptospirosis is 23.3%. This figure is above the national CFR rate of between 2.55% and 16.45%, while the highest leptospirosis attack rate was in the Tulakan district at 0.2 per 100 population. This is because 69% of the population work as farmers.

Based on the epidemic curve, the number of cases of leptospirosis is still growing. The peak of most cases is in the eighth week of 2017. In the 51st week of 2016 to the third week of 2017, there were no reported cases, which was because Pacitan DHO was ran out of RDT due to the high number of leptospirosis cases, according to information obtained during the week it happened.

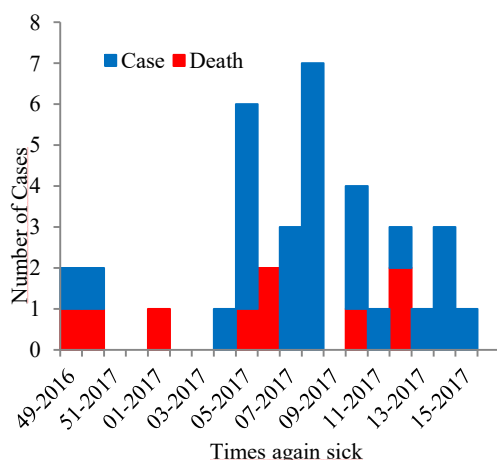


Figure 3: Epidemic curve of leptospirosis outbreak in Pacitan district, Dec 2016 - April 2017.

The distribution of leptospirosis cases by occupation shows that the disease was mostly found in the farmers 74.4 % (32 cases). The observation showed that the rice field area was mostly damp, so the environment is highly at risk for leptospira

bacteria contamination and makes the possibility of infection high considering leptospira bacteria can survive for days or months on the condition of waterlogged soil and most farmers do not use PPE.

Table 3: Distribution of leptospirosis cases by occupation in Pacitan district, Dec 2016 - April 2017.

Occupation	Number of case	%
Farmer	32	74.4
Private sector worker	3	7.0
Student	4	9.3
Village Tools	1	2.3
No data	1	2.3
Total	43	100

Table 4: Distribution of leptospirosis cases by clinical symptoms in Pacitan district, Dec 2016 - April 2017.

Clinical Symptom	Number of cases	%
Fever	39	83.0
Headache	37	78.8
Malaise	15	31.9
Myalgia	11	23.4
Conjunctival suffusion	9	19.1
Calf pain	13	27.7
Icteric	10	23.0

The distribution of leptospirosis cases in Pacitan district based on most clinical symptoms was fever (86%), headache (81%), myalgia (32%), calf pain (27.9%), icteric (23%), and conjunctival suffusion (20.9%). The emergence of icteric clinical symptoms suggests that some patients have entered the course of leptospirosis disease in the immune phase that may provide further complications. This can be avoided if the patient understands the clinical symptoms in the septicemia phase and seeks

treatment immediately. This possibly occurred because, at that time, the community had not been given the appropriate education about the Leptospirosis disease.

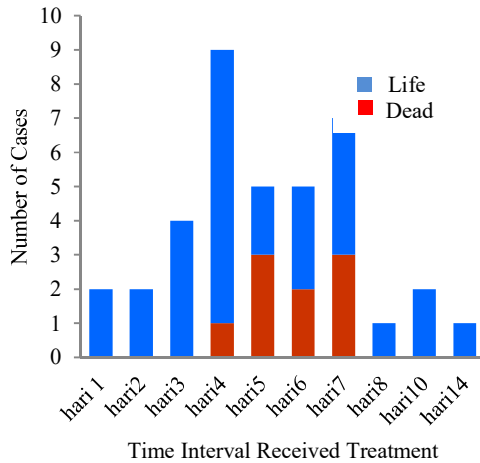


Figure 4: Distribution of leptospirosis-based mortality by treatment period.

Distribution of leptospirosis mortality by treatment period did not show any difference between the time of treatment and the incidence of death. This is inconsistent with the existing theory that many deaths occur in late treatment, so a further review of the management system and analysis of surveillance data was needed.

## 5 CONCLUSION

The leptospirosis outbreak in Pacitan district is still happening, so the cases did not cease. Based on the results of the study, the Pacitan district was said to be an endemic area of Leptospirosis. The unavailability of Hemodialysis facilities is one of the factors that increases CFR. No effective approach has been found to control the rat population in the rice fields.

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