ISSN. 2338-7475
E-ISSN. 2620-7869
Hearty
Jurnal Kesehatan Masyarakat
Berinan, Tulus, Sepenuh Hati,Berbesar Hati, Jujur, Sehat dan Kuat
Vol. 13 No. 4, Agustus 2025, Hal. 1016-1023

ANALYSIS OF RISK FACTORS, BEHAVIOR, AND ENVIRONMENTAL CONDITIONS FOR LEPTOSPIROSIS DISEASE IN PEMATANG PASIR VILLAGE, TELUK NIBUNG DISTRICT, TANJUNG BALAI CITY

Putri Safira *, Meutia Nanda, Salsabilla, Elvina, Riri Angraini, Anggina Cucu Khetri Sianturi, Dian Yustika Putri
Program Studi Ilmu Kesehatan Masyarakat, Fakultas Kesehatan Masyarakat
Universitas Islam Negeri Sumatera Utara Medan
Jl. Lap. Golf No. 120, Kab. Deli Serdang, 20353, Medan, Sumatera Utara, Indonesia
Email: putrisafira3666@gmail.com

Abstract

Leptospirosis is a zoonotic disease that is transmitted through contact with the urine of infected animals, especially rats, and often occurs in environments with poor sanitation. This study aims to analyze behavioral risk factors and environmental conditions that contribute to the spread of leptospirosis in Pematang Pasir Village, Teluk Nibung District, Tanjung Balai City in 2024. The study used *a cross-sectional* design involving 50 respondents aged 17 years and older from Wards I and VI. Data were collected through interviews using questionnaires that assessed respondents' knowledge, attitudes, and actions related to leptospirosis, as well as direct observation of environmental conditions such as waterlogging, the presence of rats, and sanitary conditions. The results showed that the majority of respondents (88%) had low knowledge about leptospirosis, although 80% implemented good personal hygiene behaviors. Only 18% of respondents carried out adequate rat control measures. Environmental observations revealed that 96% of respondents experienced puddles around their homes, and 100% indicated that their neighborhoods were flooded frequently. The presence of garbage around the house was found in 98% of respondents, and 98% of respondents often saw rats in or around the house. Most respondents (90%) had a house ≥ 2 meters away from the sewer, with 92% reporting good road conditions. Only 24% of respondents have pets, and 4% live close to ponds (< 700 meters). Factors such as poor sanitation, the presence of rodents, and the high risk of flooding are the main factors that affect the risk of spreading leptospirosis in the region. This study emphasizes the importance of increasing public education about leptospirosis and its prevention measures, as well as environmental improvement efforts to reduce the risk of infection in the affected areas.

Keywords: Environment, Leptospirosis, Behavior, Sanitation, Waterlogging, Rats

Introduction

Leptospirosis is an acute infectious disease caused by bacteria *Leptospira*, which can be transmitted from animals to humans, especially through contact with the urine of infected animals, such as rats. As a zoonotic disease, leptospirosis has a significant impact, especially in tropical and subtropical areas, including Indonesia, which are susceptible to environmental conditions that favor its spread. The transmission process often occurs through water or soil contaminated by bacteria, especially during the rainy season or floods which makes it easier for bacteria to spread more widely in the environment. Water that stagnates for a long time in residential areas increases the chances of humans being exposed to Leptospira, either directly or through wounds on the skin (Aziz & Suwandi, 2019).

Submitted: October-2024 Received: October-2024 Available Online: August-2025

Environmental factors such as poor drainage systems and waterlogging after rain exacerbate this situation. Not only environmental factors, but community behavior also plays an important role in the spread of this disease. Low public knowledge about leptospirosis, lack of awareness of the importance of preventive measures, such as using personal protective equipment when working in risky environments, and lack of efforts to control rat populations around settlements also increase the risk of infection (Sari et al., 2023). The existence of rats as the main reservoir of Leptospira is one of the main threats, especially in areas with less clean environmental conditions. Rats easily breed in unhygienic environments, and this contact between humans and animals becomes more likely (Yudhastuti, 2020).

In Indonesia, leptospirosis has become one of the public health problems that needs serious attention. In 2023, it was found that there were 2554 cases of Leptospirosis in Indonesia reported by twelve provinces, namely DKI Jakarta, West Java, Central Java, DI Yogyakarta, East Java, Banten, North Kalimantan, South Sulawesi, East Kalimantan, Riau Islands, Bali and Maluku. Of the reported cases, there were 205 deaths with a Case Fatality Rate (CFR) of 8%. Data shows that the incidence of leptospirosis tends to increase in some areas, especially in areas with poor sanitation, inadequate drainage, and high rat populations. One of the factors that affect the spread of this disease is environmental damage due to rapid urbanization that is not balanced with adequate sanitation infrastructure (Ministry of Health, 2023).

Based on environmental observations, the location selection was carried out with the consideration that Pematang Pasir Village is a coastal area, densely populated, many rat vectors are found and prone to flooding. Areas with high levels of flood intensity are very vulnerable to the spread of leptospira bacteria. This study aims to analyze behavioral risk factors and environmental conditions for the spread of leptospirosis in Pematang Pasir Village, Teluk Nibung District, Tanjung Balai City in 2024.

Method

This study used a *cross-sectional design* involving 50 respondents from Wards I and VI who were 17 years old and older. Data were collected through interviews using questionnaires that assessed knowledge, attitudes, and actions related to leptospirosis. In addition, environmental observations were carried out to identify risk factors such as waterlogging, sanitary conditions, and the presence of rats. Data analysis was carried out descriptively using frequency distribution to describe the characteristics of respondents, level of knowledge, and preventive measures related to leptospirosis and risky environmental conditions.

Results and Discussion

Location of Behavioral Risk Factors and Environmental Conditions for Leptospirosis Disease

1. Characteristics Responden

Table 1. Distribution of Respondents Based on Characteristics in Pematang Pasir Village, Teluk Nibung District, Tanjung Balai City in 2024

Characteristic	N	%
Gender		
Male	20	40
Woman	30	60
Age		
Early Adulthood (16-35 years)	11	22
Late Adulthood (26-45 years)	14	28
Early Elderly (46-55 years)	12	24
Late Elderly (56-65 years)	13	26
Education		
SD	15	30
SMP	9	18
SMA	18	36
PT	8	16
Work		
Housewives	18	36
Merchant	9	18
Self employed	12	24
Guru	6	12
Laborer	5	10
Income		
< 3.046.500	42	84
≥ 3.046.500	8	16
Total	50	100

Based on the results of a survey in Pematang Pasir Village, Teluk Nibung District, Tanjung Balai City in 2024, the majority of respondents are women with a percentage of 60%, while men are only 40%, making women a more dominant group. In terms of age, the majority of respondents are in the late adult category (46-55 years) as much as 28%, followed by the late elderly (56-65 years) with 26%. In contrast, the early adult age group (16-35 years) is the least, at only 22%.

Judging from the level of education, most of the respondents have low education, namely 30% have elementary education and 36% have high school education. Respondents with higher education (PT) are only 16%, making it the group with the least number in terms of education. In terms of

employment, the majority of respondents work as housewives with a percentage of 36%, followed by self-employed at 24%. Meanwhile, the least occupational group is labor, which only covers 10% of the total respondents.

In terms of income, the majority of respondents (84%) have an income below Rp 3,046,500, while the group with an income above that amount only covers 16%, making it the least group in the income category. All of these data show that the majority of respondents are low-educated women, working as housewives, and low-income women.

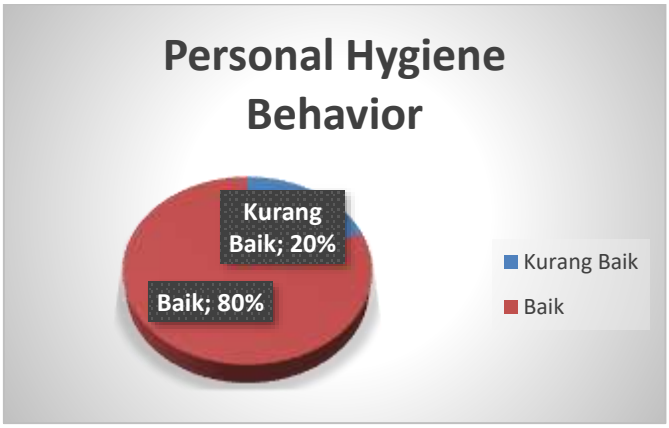
2. Respondent's Knowledge

The distribution of respondents based on knowledge can be seen in the graph below

Graph 1. Distribution of Respondents Based on Knowledge in Pematang Pasir Village, Teluk Nibung District, Tanjung Balai City in 2024

Based on Graph 1 above, public knowledge about Leptospirosis disease in Ward I and Ward VI of Pematang Pasir Village, Teluk Nibung District, Tanjung Balai City seen in Graph 1 above, the majority of respondents have less knowledge about leptospirosis, its causes, symptoms, ways of transmission and the main infectious animal types of leptospirosis, which is 88%.

3. Respondents' Personal Hygiene Behavior



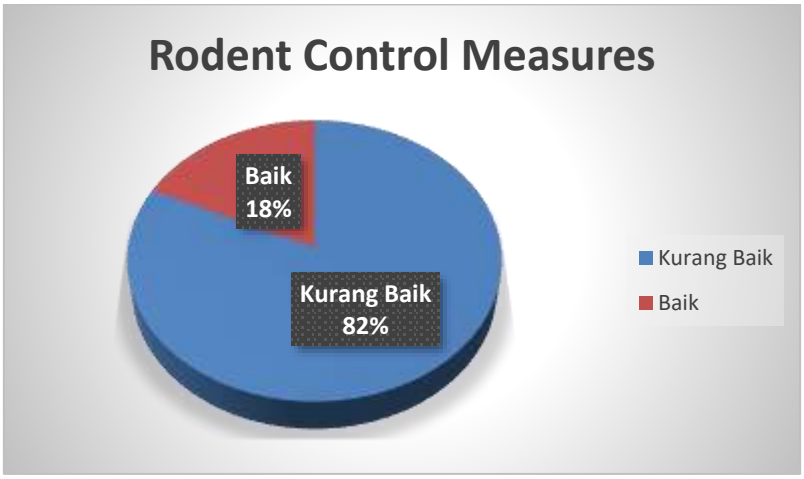
Graph 2. Distribution of Respondents Based on Personal Hygiene Behavior in Pematang Pasir Village, Teluk Nibung District, Tanjung Balai City in 2024

Based on graph 2 above, the majority of respondents had good personal hygiene behavior in efforts to prevent and control Leptospirosis disease (80%). Good attitudes include always using PPE (boots and gloves) when cleaning gutters/gutters, washing hands with soap after activities in polluted places, not bathing in the river and never washing tableware/clothes in the river.

Wearing personal protective equipment (PPE) such as boots, gloves, eye protection, aprons, masks when doing community service or activities related to water or mud can prevent leptospirosis bacteria from entering the human body. By not wearing personal protective equipment, the possibility of leptospira bacteria entering the body will be greater.

4. Respondent Rat Control Actions

Action is a response to stimuli or stimuli in real form that can be observed directly through interviews and respondent activities, is a form of real action/action of a person such as cleaning the environment, installing rat traps and installing rat poison.

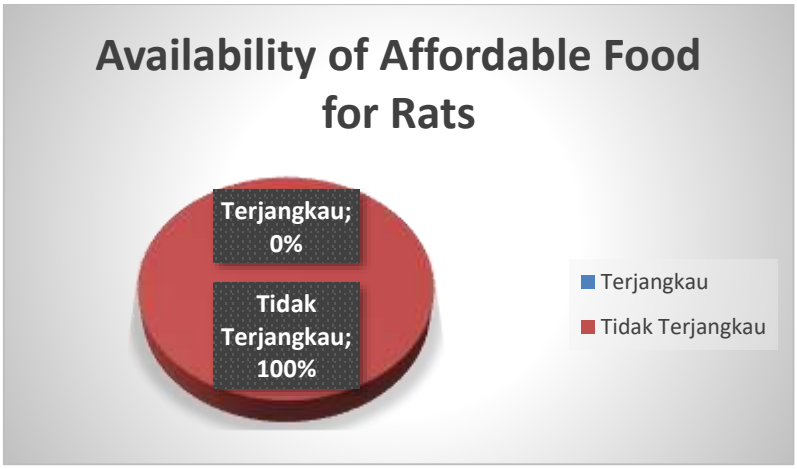


Graph 3. Distribution of Respondents Based on Rat Control Measures in Pematang Pasir Village, Teluk Nibung District, Tanjung Balai City in 2024

From the graph above, it can be seen that the respondents' actions related to the prevention of leptospirosis disease transmission are only 18% of respondents have good actions in terms of prevention and control of leptospirosis. Actions include cleaning the environment, installing rat traps, installing rat poison or other efforts in controlling the existence of rats as leptospirosis infectious animals.

5. Availability of Affordable Food for Rats

The availability of food that rats can afford refers to the conditions in which food sources accessible to rats are within range. This includes raw and ready-to-eat foods that are not stored properly, so they can attract the attention of rats and increase the risk of infestation. Improper storage of food, such as in open or non-enclosed spaces, can create opportunities for rats to access food, which can ultimately lead to health and sanitation problems in the environment.



Graph 4. Distribution of Respondents Based on Rat Control Measures in Pematang Pasir Village, Teluk Nibung District, Tanjung Balai City in 2024

Based on the survey conducted, all respondents (100%) reported that they store raw food ingredients and ready-to-eat foods (such as rice, sweet potatoes, corn, and others) in closed places, which means that the availability of food is not out of reach for rats. This practice is an important step in controlling the rat population, as improper food storage can attract the attention of rats and increase the risk of spreading the disease.

6. Environmental Observation

Observation is an activity of observing an object carefully and directly at the research location, and also systematically recording the symptoms being studied.

The distribution of respondents based on environmental observations can be seen in the graph below:

Table 2. Distribution of Respondents Based on Environmental Observations in Pematang Pasir Village, Teluk Nibung District, Tanjung Balai City in 2024

No	Observation	Already	%	No	%
1	Puddles around the house	48	96	2	4
2	Residential neighborhoods are often flooded	50	100	0	0
3	There is garbage at home/around the house	49	98	1	2
4	The distance of the sewer house ≥ 2 meters	45	90	5	10
5	The condition of the road around the house is good	46	92	4	8
6	Often see rats in/around the house	49	98	1	2
7	Pet ownership	12	24	38	76
8	The existence of ponds around the house (< 700m)	2	4	48	100

Based on the results of environmental observations in Pematang Pasir Village, most of the respondents' houses still face the problem of waterlogging, with 96% of respondents reporting the presence of waterlogging around the house. In addition, all respondents (100%) stated that their neighborhoods are often flooded, indicating a high risk of water-related environmental problems. The presence of garbage around the house was also found in 98% of respondents, and as many as 98% of respondents often saw rats in or around their homes, which is a major risk factor for the spread of diseases such as leptospirosis.

Another condition that needs to be considered is the distance of the house to the sewer, where 90% of the houses are ≥ 2 meters from the sewer, while the rest are closer which increases the risk of

poor sanitation. Although 92% of respondents reported that the road around their home was in good condition, only 24% had pets, and the majority (76%) did not own a pet. On the other hand, only 4% of respondents live close to ponds (< 700 meters), which can affect the environmental health of respondents.

Factors such as waterlogging, garbage, and the presence of rodents in residential environments contribute greatly to health risks, particularly zoonotic diseases. Therefore, the community is encouraged to maintain environmental cleanliness by cleaning garbage regularly, repairing waterways to prevent inundation, and installing rat traps to reduce the rat population in residential areas.

Conclusion

The results showed that the majority of respondents (88%) had low knowledge about leptospirosis, although 80% implemented good personal hygiene behaviors. Only 18% of respondents carried out adequate rat control measures. Environmental observations revealed that 96% of respondents experienced puddles around their homes, and 100% indicated that their neighborhoods were flooded frequently. The presence of garbage around the house was found in 98% of respondents, and 98% of respondents often saw rats in or around the house. Most respondents (90%) had a house ≥ 2 meters away from the sewer, with 92% reporting good road conditions. Only 24% of respondents have pets, and 4% live close to ponds (< 700 meters).

References

[1] Andriani, R., & Sukendra, D. M. (2020). Faktor Lingkungan dan Perilaku Pencegahan dengan Kejadian Leptospirosis di Daerah Endemis. *Higeia Journal of Public Health Research and Development*, *1*(3), 625–634. http://journal.unnes.ac.id/sju/index.php/higeia

[2] Ariani, N., & Wahyono, T. Y. M. (2021). Faktor – faktor yang mempengaruhi Kejadian Leptospirosis di 2 kabupaten Lokasi Surveilans Sentinel Leptospirosis Provinsi Banten tahun 2017 – 2019. *Jurnal Epidemiologi Kesehatan Indonesia*, *4*(2), 57–64. https://doi.org/10.7454/epidkes.v4i2.4063

[3] Aziz, T., & Suwandi, J. F. (2019). Leptospirosis : Intervensi Faktor Resiko Penularan Leptospirosis : The Intervention of Transmitted Risk Factors. *Medical Journal Of Lampung University*, *8*, 232–236.

[4] Jurnal Kesehatan Masyarakat, P., Eka Purnama, S., Hartono, B., Studi Magister Ilmu Kesehatan Masyarakat, P., & Kesehatan Masyarakat, F. (2022). Faktor Risiko Kejadian Leptospirosis Di Indonesia: Literature Review. *Jurnal Kesehatan Masyarakat*, *6*(3), 2010–2022.

[5] Kementrian Kesehatan. (2023). *Profil Kesehatan*.

[6] Kusumajaya, A., Utomo, B., & Hikmandari. (2018). Tikus Pada Daerah Kasus Leptospirosis. *Bulletin Keslingmas*, *39*(3), 111–120.

[7] Ningsih, Sri Wahyuni, Sakundarno, Adi, Mateus Sakundarno, Saraswati, L. D. (2019). Systematic review metode intervensi pengetahuan masyarakat dalam pengendalian kasus leptospirosis di wilayah kota Semarang. *Jurnal Kesehatan Masyarakat (e-Journal)*, *7*(1), 211–220.

[8] Nugroho, A., Adi, M. S., & Nurjazuli. (2023). *Jurnal Ilmu Kesehatan Masyarakat Penularan Leptospirosis di Indonesia : Literature Review*. *12*(123), 57–64.

[9] Pujiyanti, A., Widjajanti, W., Mulyono, A., & Trapsilowati, W. (2020). Assessment Pengetahuan dan Perilaku Masyarakat pada Peningkatan Kasus Leptospirosis di Kecamatan Gantiwarno, Kabupaten Klaten. *Jurnal Vektor Penyakit*, *14*(2), 73–82. https://doi.org/10.22435/vektorp.v14i2.2821

[10] Rajapakse, S. (2022). Leptospirosis: Clinical aspects. *Clinical Medicine, Journal of the Royal College of Physicians of London*, *22*(1), 14–17. https://doi.org/10.7861/clinmed.2021-0784

[11] Sari, M., Haris, R., Syamsul, M., Sinaga, J., Sari, N. P (2023). Kesehatan Lingkungan Bencana. In *Researchgate.Net* (Issue March). https://books.google.com/books?hl=en%5C&lr=%5C&id=ENPQEAAAQBAJ%5C&oi=fnd%5C&pg=PR7%5C&dq=sanitasi+lingkungan+dan+hygieni+terhadap+stunting+pada+balita+usia+%221+3%22+tahun%5C&ots=ahV5asehOw%5C&sig=m1Tifu9KnZgRodxqByKBuxeyVX0

[12] Supriyo, E., Pujihastuti, I., Broto, R. W., & Arifan, F. (2020). Uji Efikasi Formulasi Rodentisida Cair Dengan Bahan Aktif Permentrin Dan Malathion Pada Tikus Sawah, Tikus Rumah Dan Tikus Pohon Dalam Mencegah Penyakit Leptospirosis. *Gema Teknologi*, *20*(4), 130–133. https://doi.org/10.14710/gt.v20i4.29301

[13] Widjajanti, W. (2020). Epidemiologi, diagnosis, dan pencegahan Leptospirosis. *Journal of Health Epidemiology and Communicable Diseases*, *5*(2), 62–68. https://doi.org/10.22435/jhecds.v5i2.174

[14] Widiastuti, D., & Priyanto, D. (2020). Kondisi Kebersihan Lingkungan Berhubungan dengan Risiko Penularan Kasus Leptospirosis di Area Pasar Tradisional.

[15] Yudhastuti, R. (2020). Pengedalian Vektor dan Rodent. *Suparyanto Dan Rosad (2015*, *5*(3), 248–253.

[16] Zuhria & Lestari, P. D. (2022). Gambaran Pengetahuan dan Pemahaman Siswa tentang Peranan Tikus sebagai Hewan Penular Leptospirosis. *Jurnal Inovasi Hasil Pengabdian Masyarakat (JIPEMAS)*, *5*(3), 355–364. https://doi.org/10.33474/jipemas.v5i3.14124

[17] Zukhruf, I. A., & Sukendra, D. M. (2020). Analisis Spasial Kasus Leptospirosis Berdasar Faktor Epidemiologi dan Faktor Risiko Lingkungan. *HIGEIA Journal of Public Health Research and Development*, *2*(3), 386–395.