Leptospirosis in India: The Disease That Rises with the Rain

Dr. Iqra Arif*

Epidemiologist, Centre for One Health, National Centre for Disease Control, Ministry of Health and Family Welfare, New Delhi

Corresponding Author
Dr. Iqra Arif
Email: iqrancdc@gmail.com

OPEN ACCESS

Keywords

Leptospirosis; Monsoon; India; Floodwater; Zoonotic Disease

How to cite this article:

Arif, I. 2026. Leptospirosis in India: The Disease That Rises with the Rain. *Vigyan Varta* 7 (09): 82-85.

ABSTRACT

Leptospirosis is a bacterial infection that spreads through water contaminated by the urine of infected animals, especially rodents. In India, cases surge every monsoon season as heavy rains, flooding, and poor drainage create ideal conditions for the bacteria to survive and spread. This article explains how leptospirosis spreads, why it is closely linked to the monsoon, who is most at risk, and what can be done to prevent and control outbreaks.

INTRODUCTION:

Every year, as the monsoon clouds gather over India, so does a familiar but often overlooked health threat: leptospirosis. This bacterial disease, sometimes called "rat fever," spreads when floodwater or wet soil contaminated with animal urine comes into contact with human skin, eyes, nose, or mouth. While it can affect anyone, it hits hardest in urban slums, flood-prone areas, and among people who work outdoors (Gupta *et al*., 2023; Herbreteau & Picardeau, 2026).

Leptospirosis is underreported in India, but studies show high seroprevalence in tropical regions with heavy rainfall, with rates varying from 6.4% to 30.9% (Dinkar *et al*., 2026). The disease is endemic in southern and western states and is primarily transmitted through contact with the urine of infected rodents and domestic animals (Krishnan *et al*., 2024). Understanding this disease is crucial, because early diagnosis and simple preventive measures can save lives.

What Is Leptospirosis?

Leptospirosis is caused by *Leptospira* bacteria, which live in the kidneys of infected animals such as rats, cattle, dogs, and pigs. These animals shed the bacteria in their urine, which contaminates water, soil, and mud. Humans become infected when this contaminated water enters the body through cuts, abrasions, or mucous membranes (eyes, nose, mouth) (Gupta *et al*., 2023; Bilung *et al*., 2026).

The disease can range from mild flu-like illness to severe, life-threatening conditions affecting the kidneys, liver, lungs, and brain. Symptoms usually appear 5–14 days after exposure and include high fever, headache, muscle pain (especially in the calves and lower back), red eyes, vomiting, and jaundice (Dinkar *et al*., 2026). Severe cases, known as Weil's disease, can lead to kidney faliure, bleeding and respiratory distress.

Why Leptospirosis Rises with the Monsoon

The monsoon creates a perfect storm for leptospirosis transmission in India.

1. **Floodwater and waterlogging:** Heavy rainfall leads to overflowing drains, flooded roads, and stagnant water in low-lying areas. This water mixes with animal urine and becomes a breeding ground for *Leptospira* bacteria (Coral-Almeida *et al*., 2026; Gupta, 2025). People wading through floodwater—whether commuting, working, or rescuing others—are at high risk.

2. **Rodent proliferation:** Urban areas with poor waste management and garbage accumulation see rising rodent populations during the monsoon. More rats mean more contaminated urine in the environment (Coral-Almeida *et al*., 2026; Dinkar *et al*., 2026).

3. **Poor drainage and sanitation:** Inadequate drainage systems, especially in informal settlements and older city neighbourhoods, allow water to stagnate for days. This creates sustained wet environments where *Leptospira* can survive for weeks (Coral-Almeida *et al*., 2026; WHO, 2026).

4. **Seasonal patterns:** Studies in India show that leptospirosis seroprevalence peaks in October, following the monsoon months, due to increased flooding and rodent activity (Dinkar *et al*., 2026). This seasonal pattern is consistent across tropical regions with heavy rainfall, with the majority of acute febrile illness cases occurring during the monsoon season (June to October) (Ravikoti *et al*., 2025).

Who Is Most at Risk?

While anyone exposed to contaminated water can contract leptospirosis, certain groups face much higher risk:

1. **Sanitation and sewage workers** – Regularly handle waste and floodwater.

2. **Farmers and agricultural workers** – Work in wet fields and have contact with livestock (Dinkar *et al*., 2026).

3. **Construction and municipal workers** – Often work outdoors in waterlogged areas.

4. **Emergency responders** – Rescue people during floods and come into direct contact with contaminated water.

5. **Residents of flood-prone areas and urban slums** – Live in areas with poor drainage and high rodent density (Coral-Almeida *et al*., 2026; WHO, 2026).

Older adults, pregnant women, and people with chronic conditions like diabetes, asthma, or lung disease are also at higher risk of developing severe illness (Dinkar *et al*., 2026).

Epidemiology and Burden in India

Leptospirosis has been endemic in India since the early 20th century, with significant

outbreaks occurring in coastal regions during July, August, and September (Dinkar *et al*., 2026). More than half a million instances of severe leptospirosis are diagnosed each year in India, with a fatality rate of more than 10% (Dinkar *et al*., 2026).

The Southern region has the highest positivity rate at 25.6%, followed by Northern (8.3%), Western (3.5%), Eastern (3.1%), and central India (3.3%) (Dinkar *et al*., 2026). Coastal states such as Andhra Pradesh (64.7%), Kerala (60.6%), Odisha (52.3%), Tamil Nadu (45%), and the Andaman and Nicobar Islands (42.15%) show particularly high prevalence (Choudhary *et al*., 2023).

A systematic review and meta-analysis of leptospirosis in India highlighted significant gaps in epidemiological data and called for enhanced surveillance using a One Health approach (Gupta *et al*., 2023; Krishnan *et al*., 2024).

Prevention and Control

Preventing leptospirosis requires action at individual, community, and policy levels.

Individual precautions

- **Avoid wading through floodwater** – If unavoidable, wear waterproof boots and gloves.
- **Cover cuts and wounds** – Use waterproof bandages to prevent bacteria from entering.
- **Wash thoroughly after exposure** – Clean skin with soap and water after contact with floodwater or wet soil.
- **Seek early medical care** – If fever, muscle pain, or red eyes develop after flood exposure, consult a doctor immediately (Dinkar *et al*., 2026).

Community and municipal actions

- **Improve drainage and waste management** – Reduce waterlogging and rodent habitats (Gupta, 2025).
- **Rodent control programs** – Target high-risk areas like markets, slums, and construction sites.
- **Public awareness campaigns** – Educate residents about risks and preventive measures before and during monsoon.
- **Surveillance and early warning systems** – Monitor cases and issue alerts during heavy rainfall (Krishnan *et al*., 2024; Kumar & Singh, 2025).

Healthcare system readiness

- **Train clinicians** – Recognise leptospirosis symptoms and differentiate from dengue, malaria, and viral fevers.
- **Ensure diagnostic availability** – Rapid tests and laboratory support for early confirmation.
- **Stock appropriate antibiotics** – Doxycycline and penicillin are effective if given early (Dinkar *et al*., 2026).

CONCLUSION

Leptospirosis is a disease of inequality. It thrives where drainage is poor, waste accumulates, and people are forced to wade through floodwater to earn a living or reach home. As climate change makes monsoons more erratic and intense, the risk of outbreaks will only grow. But leptospirosis is preventable. With better infrastructure, public awareness, and healthcare readiness, India can break the cycle of rain-driven disease and protect its most vulnerable citizens.

REFERENCES

Bilung, L. M., Tahar, A. S., Pui, C. F., Bakeri, M. K. S., Su'ut, L., Ngui, R., Kira, R., & Apun, K. (2026). Leptospira and leptospirosis: A review of species classifications, pathogenesis, and global epidemiology. *Microbial Pathogenesis*, 189, 107589. https://doi.org/10.1016/j.micpath.2026.107589

Choudhary, S., Choudhary, R. K., Kumar, M., Singh, S., & Malik, Y. S. (2023). Epidemiological status of leptospirosis in India. *Journal of Pure and Applied Microbiology*, 17(4), 1968–1977. https://doi.org/10.22207/JPAM.17.4.44

Coral-Almeida, M., Ortiz-Prado, E., & Vasconez-Gonzalez, J. (2026). Urban flooding as a biohazard risk: A call to address environmental and health inequities in tropical cities. *PLoS Neglected Tropical Diseases*, 20(2), e0013981. https://doi.org/10.1371/journal.pntd.0013981

Dinkar, A., Singh, J., Kumar, N., Kumar, K., & Yadav, R. (2026). Clinical profile and severity correlation of acute leptospirosis in Northern India, 2019–2023: A tertiary care center-based study. *Recent Advances in Inflammation & Allergy Drug Discovery*, 23(1), 45–56. https://doi.org/10.2174/0127722708436787251112233505

Gupta, K. (2025). Impact of urban flooding on water quality in India with special reference to Mumbai. In B. Jiménez Cisneros & A. K. Makarigakis (Eds.), *Impact of urban floods on water quality* (pp. 103–108). Cambridge University Press. https://doi.org/10.1017/9781316340332.009

Gupta, N., Wilson, W., & Ravindra, P. (2023). Leptospirosis in India: A systematic review and meta-analysis of clinical profile, treatment and outcomes. *Infez Med*, 31(3), 290–305. https://doi.org/10.53854/liim-3103-4

Herbreteau, V., & Picardeau, M. (2026). Climate change and leptospirosis: A growing environmental threat. *MicroLife*, 7, uqag015. https://doi.org/10.1093/femsml/uqag015

Krishnan, B. K., Balasubramanian, R., & Kumar, S. (2024). Leptospirosis in India: Insights on circulating serovars and the need for a One Health approach. *Indian Journal of Medical Microbiology*, 42(2), 145–158. https://doi.org/10.4103/ijmm.ijmm_23_156

Kumar, A., & Singh, P. (2025). Frequency distribution and epidemiological importance of Leptospira serovars globally and in India: A review. *Journal of Pharmaceutical Technology*, 12(11), 36–49. https://www.jptcp.com/index.php/jptcp/article/view/12438

Ravikoti, S., Mohanasundari, S. K., Mani, P., & Sravanthi, K. (2025). Current evidences and clinical perspectives of pediatric leptospirosis in India: A narrative review. *International Journal of Contemporary Microbiology*, 11(4), 22–35. https://www.ijcmas.com/14-12-2025/Shyamala Ravikoti, *et al*.pdf

World Health Organization. (2026). A cluster of co-occurring cases of leptospirosis and brucellosis in Uttarakhand, India. *WHO Western Pacific Surveillance and Response*, 17(6), 1–7. https://ojs.wpro.who.int/ojs/index.php/wpsar/article/view/1327.