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Modeling the dynamics of leptospirosis in India

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Leptospirosis, a formidable zoonotic threat spawned by *Leptospira*, plagues tropical and subtropical realms. This study delves deep into tropical Indian states, namely, Kerala, Gujarat, Karnataka, Maharashtra, and Tamil Nadu, unraveling the dynamics of leptospirosis through a comprehensive mathematical model that embraces temperature-driven growth rates of *Leptospira*.

Sensitivity analysis and parameter estimation techniques fortified the model's accuracy, unraveling the factors shaping leptospirosis transmission. Notably, the numerical results highlight the significant impact of rainfall, fishing, climate, mining, agriculture, and cattle farming on leptospirosis prevalence in the endemic states of India.

Finally, our study urges resolute preventive action to control and combat leptospirosis in India. Strengthening surveillance, impactful awareness campaigns, targeted interventions, and improved hygiene practices among high-risk individuals are vital. Embracing these proactive strategies will alleviate the burden of leptospirosis and enhance public health in India and beyond.