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Khew C., Mohd-Fowzi N., Zaifulzaman N., Harun S., Abdul Razak S., Mohamed-Hussein Z.-A., Mohd-Assaad N.
Integrative transcriptomic and network analysis reveals small open reading frames associated with cellular adaptive responses and methylation-linked pathogenicity in *Leptospira interrogans*

(2026) *Functional and Integrative Genomics*, 26 (1), art. no. 106

DOI: 10.1007/s10142-026-01882-4

ABSTRACT: Small open reading frames (sORFs) are increasingly recognized as crucial regulators in bacterial gene expression, yet their biological roles remain largely unexplored in pathogenic species. Here, we investigated the genome-wide regulatory landscape of sORFs in *Leptospira interrogans* serovar Manilae strain UP-MMC-NIID-LP using RNA-seq-based transcriptomic profiling integrated with weighted gene co-expression network analysis (WGCNA). This study followed the targeted disruption of *lomA*, a gene mediating 4-methylcytosine (4mC) DNA modification. Loss of 4mC was associated with broad transcriptional dysregulation and phenotypic impairments, including reduced motility, adhesion, and virulence. Analysis of 363 predicted sORFs identified 31 with significant differential expression ($FDR < 0.05$, $|\log_2FC| \geq 1$) across wild-type, mutant, and complemented strains. Gene co-expression networks constructed using WGCNA and prioritized via topological ranking algorithms in Cytoscape. This analysis revealed seven high-confidence putative hub-like sORFs, which were significantly enriched in pathways related to flagellar assembly, DNA recombination, and transcriptional regulation. These candidates appear to function as core components supporting genome stability and adaptive stress responses. Several previously uncharacterized sORFs occupied central positions within co-expression modules, highlighting their potential roles in metabolic and regulatory networks. To our knowledge, this represents the first genome-wide integration of methylation-driven sORF regulation in *Leptospira*, revealing small proteins as associated with the link between epigenetic control bacterial pathogenicity and adaptability. These findings provide a foundation for future strategies targeting sORF-mediated regulation in pathogenic spirochetes.

LANGUAGE OF ORIGINAL DOCUMENT: English

Viera-Contreras M.J., Contreras G.M., López J., Chois J.A., Cuello E.J., Bermúdez E.M., Gómez L.G.

Weil disease as a differential diagnosis of febrile icteric syndrome: a case report [Enfermedad de Weil como diagnóstico diferencial del síndrome febril icterico: reporte de caso]

(2026) *Revista Colombiana de Gastroenterología*, 41 (2), pp. 215 - 220

DOI: 10.22516/25007440.1396

ABSTRACT: The clinical case of a 56-year-old woman with febrile icteric syndrome is described, whose clinical course led to the diagnosis of severe leptospirosis, known as Weil disease. Leptospirosis is a re-emerging zoonosis primarily transmitted through contact with urine from infected rodents. It presents in two phases: a septicemic phase and an immune phase, which may progress to multiorgan failure. The patient developed jaundice, severe thrombocytopenia, elevated bilirubin levels, and respiratory deterioration. The diagnosis was confirmed by a positive automated immunoassay (AIA) for *Leptospira*. Due to penicillin allergy, treatment with ceftriaxone was initiated. The patient required management in the intensive care unit (ICU) because of pulmonary involvement, evidenced by pneumonitis and acute respiratory distress syndrome (ARDS). Clinical evolution was favorable, with resolution of symptoms and normalization of clinical parameters. This case underscores the importance of early assessment, accurate diagnosis, and multidisciplinary management. It highlights the need to consider this infection in patients exposed to risk factors such as stagnant water or rodents. In addition, it emphasizes the usefulness of the national protocol issued by the National Institute of

Health (INS) for diagnosis and treatment. This report provides valuable information for clinical management and epidemiological surveillance.

LANGUAGE OF ORIGINAL DOCUMENT: Spanish

Yanik A., Sarikaya R.İ.

Kikuchi-Fujimoto disease developing after brucellosis and leptospirosis coinfection presenting with gastrointestinal system bleeding: a case report [Gastrointestinal Sistem Kanaması ile Başvuran Hastada

(2026) Mikrobiyoloji Bulteni, 60 (2), pp. 220 - 226

DOI: 10.5578/mb.202602150

ABSTRACT: Brucellosis and leptospirosis are zoonotic infections with overlapping clinical features, especially in endemic regions. Coinfection of these pathogens is rare and may trigger secondary inflammatory disorders through excessive immune activation. In this report, a rare case of Kikuchi-Fujimoto disease following brucellosis and leptospirosis coinfection with gastrointestinal bleeding was presented. A 31-year-old male presented with fever, malaise, diarrhea and black, foul-smelling stools for three days. Physical examination revealed conjunctival hyperemia, hepatosplenomegaly and diffuse abdominal tenderness. Laboratory findings showed elevated AST, ALT and creatine kinase levels, thrombocytopenia, and prolonged international normalized ratio. Upper gastrointestinal endoscopy demonstrated antral erosions with an active bleeding site. Serologic tests revealed positive *Brucella* agglutination and *Leptospira* microscopic agglutination tests with titers of 1/320 and 1/400, respectively. The patient was treated with doxycycline and rifampicin. Three weeks later, he developed painful cervical lymphadenopathy. Excisional biopsy showed necrotizing lymphadenitis consistent with Kikuchi-Fujimoto disease. The patient improved with symptomatic therapy and showed no recurrence at three-month follow-up. Although brucellosis and leptospirosis coinfection is rare, it may induce immune dysregulation leading to secondary inflammatory lymphadenitis. This case highlights the potential link between zoonotic coinfections and Kikuchi-Fujimoto disease and underlines the importance of considering this diagnosis in patients presenting with fever and lymphadenopathy following infectious episodes. Bu eser CC BY-NC Atıf-GayriTicari Türev Eser Yaratma 4.0 Uluslararası Lisansı kapsamında lisanslanmıştır. Veri Paylaşım Beyanı: Bu çalışmanın bulgularını destekleyen veriler, makul talepler doğrultusunda sorumlu yazardan temin edilebilir.

LANGUAGE OF ORIGINAL DOCUMENT: English

Lo S.-H., Huang C.-H., Chen T.-C., Lin C.-Y., Lu P.-L., Chang K.

Differentiating leptospirosis from Rickettsial diseases and Q fever: a syndrome-based study in Southern Taiwan

(2026) Tropical Doctor

DOI: 10.1177/00494755261454021

ABSTRACT: Leptospirosis, Q fever, scrub typhus, and murine typhus are endemic zoonotic diseases in southern Taiwan that often present as acute undifferentiated febrile illness. We retrospectively compared epidemiological, clinical, laboratory, and outcome characteristics of leptospirosis (n = 41) and rickettsial infections, including Q fever, scrub typhus, and murine typhus (QSM; n = 103), in Kaohsiung City from 2013 to 2024. Leptospirosis occurred mainly during rainy and typhoon seasons and was associated with myalgia, gastrointestinal symptoms, jaundice, conjunctival suffusion, hepatic and renal dysfunction, leukocytosis,

elevated C-reactive protein, and higher rates of acute kidney injury and shock. QSM occurred year-round, with eschar characteristic of scrub typhus, while prolonged activated partial thromboplastin time and relative bradycardia were more common in QSM. QSM generally showed a milder clinical course, particularly Q fever. Distinct clinical and seasonal patterns may facilitate early differentiation and risk stratification in endemic areas.

LANGUAGE OF ORIGINAL DOCUMENT: English

Eddicks M., Seifert A., Gründl J., Strutzberg-Minder K., Eddicks L., Tabeling R., Ritzmann M.

Integrated diagnostic approach for *Leptospira* spp. detection in SMEDI associated reproductive disease of swine

(2026) Veterinary and Animal Science, 33, art. no. 100700

DOI: 10.1016/j.vas.2026.100700

ABSTRACT: Leptospirosis is a notifiable disease in human and all mammals in Germany. Besides late term abortions, leptospiral infection of sows is also mentioned as a differential in terms of SMEDI. The objective of the present study was to apply an integrated diagnostic approach in such cases under field conditions and to evaluate best suited specimen for molecular detection of *Leptospira* spp. in affected fetuses. Therefore, MAT of fetal and sow sera and LipL32 and 16S RNA gene qPCR for fetal specimens (kidney, liver, stomach content, meconium) was used for *Leptospira* spp. diagnostic to detect pathogenic serovars and to distinguish between pathogenic groups I and II of *Leptospira* spp. in SMEDI associated cases, respectively. In total, 36 litters with 142 fetuses from 16 farms were enrolled in this examination. In total 44.4 % of the sow sera were positive by MAT. Six out of sixteen (37.5 %) serum samples were positive for only one serovar, whereas 62.5 % (10/16) showed multiple positive results. MAT positivity for serovars Bratislava, Pomona, Australis and Autumnalis in sows was significantly associated with positive qPCR results from the corresponding offspring. All PCR positive samples (n = 20) revealed that leptospires belonged to subclade P1 or pathogenic group I identified by 16S RNA gene PCR. Highest detection rates and DNA loads were present in kidney samples whereas stomach and meconium samples revealed the lowest rates of detection and DNA loads.

LANGUAGE OF ORIGINAL DOCUMENT: English

Huels F., Jacob J.

Rodent-borne pathogens as economic and zoonotic health threat to livestock farming: a review

(2026) One Health, 22, art. no. 101448

DOI: 10.1016/j.onehlt.2026.101448

ABSTRACT: Introduction: Economic losses and health risks caused by disease outbreaks in farm animals pose a considerable threat worldwide. Rodents play a crucial role in the transmission of a variety of zoonotic pathogens acting as intermediate, main or reservoir hosts for many bacteria, viruses and parasites. Rodent-borne pathogen transmission can occur through direct or indirect contact, through contaminated food and water or through arthropod vectors. This review provides an overview about the current state of knowledge to demonstrate how rodents are involved in the transmission of the most relevant livestock pathogens. Material and methods: Two literature databases (Web of Science, PubMed) were used to create a list of publications on all relevant pathogen types (bacteria, viruses, parasites, other), the most mentioned rodent species involved in pathogen transmission and the most common livestock types (cattle, swine, poultry) published in English from inception to September 2025. Results: The 494 articles that matched keywords/abstract and focus considered bacteria (n=204) as the main pathogen type, followed by parasites (n=166), viruses (n=92), others

(n=15) and rodents on farms (n=17). The most studied pathogens were *Leptospira*, *Salmonella*, *Toxoplasma*, and *Trichinella*. Most papers concentrated on commensal *Rattus* spp. and *Mus musculus* – wild rodent species are clearly underrepresented and there were mostly descriptive studies without consideration of processes and intervention. Conclusion: The role of rodents in transmission pathways of an extremely broad range of pathogens is demonstrated. Further research is needed to understand the mechanisms to decrease economical cost and health issues for commensal and field/forest rodent species alike.

LANGUAGE OF ORIGINAL DOCUMENT: English

Santa Cruz López C.Y., Saldaña Miranda M., Alvarado Dávila X., Del Maestro Morales M., Rivera Salazar C., Zulueta Vásquez B.

AUTHOR FULL NAMES: Santa Cruz López, Cinthya Yanina (57226066936); Saldaña Miranda, Marcela (60076997800); Alvarado Dávila, Xiomara (60640074400); Del Maestro Morales, Magaly (60640190000); Rivera Salazar, Crhistian (60639952600); Zulueta Vásquez, Blanca (60640305400)

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Seroprevalence and epidemiological characterization of *Leptospira* spp. in febrile patients from the epidemiological surveillance system in Jaén and San Ignacio, Cajamarca, Perú, 2021-2023

(2026) Revista de la Facultad de Medicina Humana, 26 (1), pp. 18 - 25

DOI: 10.25176/RFMH.v26i1.6815

ABSTRACT: Introduction: Leptospirosis is a bacterial zoonosis of public health importance. Objective: To determine the seropositivity, epidemiological characteristics, and distribution of *Leptospira* spp. serovars in febrile patients from the epidemiological surveillance system of Ministry of Health facilities in Jaén and San Ignacio, Cajamarca, Peru, during 2021–2023. Methods: An observational, cross-sectional, and retrospective study was conducted based on the secondary analysis of a database from the epidemiological surveillance system. A total of 4,489 blood samples from febrile patients of both sexes, with negative results for dengue, Zika, and chikungunya, were included. All samples were tested using IgM ELISA for *Leptospira* spp.; reactive or indeterminate samples were further evaluated using the microscopic agglutination test (MAT) for confirmation and serovar identification. Descriptive analysis and chi-square tests were performed. Results: IgM reactivity by ELISA was 28.4% (1276/4489), and 10.8% (485/4489) of samples were indeterminate. Among the 1,761 ELISA-reactive or indeterminate samples, 89.9% (1584/1761) were seropositive by MAT. Seropositivity was similar between women and men (89.6% vs. 90.4%; $p = 0.576$), but was higher in adults aged 30–59 years (92.3%; $p = 0.007$). The districts with the highest frequency of seropositive cases were Jaén (21.2%), San Ignacio (17.3%), and Morro Solar (12.9%). The most frequent serovars were Varillal (46.34%), Hurstbridge (14.16%), Icterohaemorrhagiae (10.88%), and Bratislava (6.18%). Conclusion: Seropositivity to *Leptospira* spp. was high among febrile patients in the epidemiological surveillance system of Jaén and San Ignacio, with higher frequency in adults aged 30–59 years. Article published by the Revista de la Facultad de Medicina Humana of Universidad Ricardo Palma. It is an open access article, distributed under the terms of the Creative Commons License: Creative Commons Attribution 4.0 International, CC BY 4.0 (<https://creativecommons.org/licenses/by/4.0/>), which allows non-commercial use, distribution and reproduction in any medium, provided that the original work is duly cited. For commercial use, please contact revista.medicina@urp.edu.pe

LANGUAGE OF ORIGINAL DOCUMENT: English

Carvajal M., Azócar-Aedo L., Barrios N., Gallardo M.

First report of seropositivity to pathogenic *Leptospira* in backyard hens: potential poultry health issue and zoonotic risk

(2026) Poultry Science, 105 (8), art. no. 107092

DOI: 10.1016/j.psj.2026.107092

ABSTRACT: Leptospirosis, a bacterial zoonotic disease of worldwide distribution, has not been extensively studied in birds, although leptospiral infection has been described in these animals. In this study, 62 backyard hens were sampled in three suburban areas near the city of Puerto Montt, southern Chile. A panel of eight serogroups and serovars of pathogenic *Leptospira* were tested using the Microscopic Agglutination Test to determine the seropositivity rate, serogroups, and serovars causing serological reactions, and to quantify antibody titers. A seropositivity rate of 51.61% (32/62) (95% Confidence Interval= 39.17%–64.05%) was estimated, with reactivity detected most frequently for the Sejroe (serovar Hardjo) (34.4%; n = 11), followed by Autumnalis (serovar Autumnalis) (21.9%; n = 7), Pomona (serovar Pomona) (9.4%; n = 3), and Canicola (serovar Canicola) (3.1%; n = 1) serogroups. Of the animals that tested positive, 53.1% reacted to a single serogroup, while 25.0% reacted to four different serogroups; 12.5% reacted to three serogroups, and 9.4% reacted to two serogroups. Coagglutinations were present in 31.3% (n = 10) of the seropositive samples, with Hardjo/Pomona/Tarassovi/Autumnalis (40.0%; n = 4) being the most frequent combination. Antibody titers ranged from 1:100 to 1:3200, with 1:100 being the highest proportion. The high seropositivity rate, presence of anti-*Leptospira* antibodies, and cross-reactivity among serogroups/serovars in the sampled hens indicate exposure to the bacteria and reveal an unknown potential poultry health issue and a zoonotic risk concern that require awareness given the widespread practice of poultry farming worldwide. © 2026 The Authors

LANGUAGE OF ORIGINAL DOCUMENT: English

Levada Pereira L.

From global guidance to tropical reality: implementing NHP leptospirosis surveillance in One Health frameworks

(2026) Journal of Medical Primatology, 55 (3), art. no. e70085

DOI: 10.1111/jmp.70085

Letter to the Editor:

The comprehensive review by Maaskant et al. regarding leptospirosis in non-human primates (NHPs) provides a vital “One Health” framework for managing this emerging zoonosis. However, translating these global guidelines into local action remains a critical challenge for tropical regions, where the human–NHP interface is most porous.

In nations like Brazil, NHPs are not merely accidental hosts but essential sentinels for public health. As climate change is now known to aggravate over 50% of human pathogenic diseases [2], urbanization and extreme weather create “perfect storm” conditions for *Leptospira* transmission. Although the review emphasizes integrated surveillance, implementation in resource-limited settings should leverage existing infrastructures, such as the yellow fever sentinel systems already established in South America.

To address the annual global burden of approximately 1 million human cases [3], we must move beyond diagnostic protocols extrapolated from other species. Validating NHP-specific point-of-care tests is a priority for real-time monitoring in high-risk zones. Furthermore, the risk of “spill-back” transmission from

environmental contamination underscores the need for global health security strategies that account for ecological complexity.

By adapting global guidance to tropical ecological realities, we can transform reactive veterinary care into a proactive, interdisciplinary early-warning system. This integration is essential to mitigate the rising morbidity of leptospirosis in both human and animal populations.

LANGUAGE OF ORIGINAL DOCUMENT: English

Wasiński B.

***Leptospira* infections in cats: what do we know?**

(2026) Pathogens, 15 (5), art. no. 506

DOI: 10.3390/pathogens15050506

ABSTRACT: The incidence of *Leptospira* spp. infections in cats did not seem to be of major importance until the early 21st century. The relatively rare occurrence of individuals presenting antibodies against *Leptospira* spp. and the almost unheard of clinical cases appeared to suggest that felids are poorly prone to *Leptospira* infections. Considering the close contact of cats with rodents (mice, rats, etc.), which are the main reservoir of leptospires, the above observations may, on the one hand, be surprising, but on the other hand, may reflect species-specific biological or ecological factors influencing susceptibility, although the underlying mechanisms remain poorly understood. The suspicions indicating cats as incidental hosts or asymptomatic carriers of *Leptospira* spp., their proximity to humans, and the “One Health” approach—particularly relevant recently in control of zoonoses—contributed in recent decades to greater research interest in feline leptospiral infections. Recent increasingly frequent data on the occurrence of antileptospiral antibodies in cats, cases of isolation of leptospiral DNA or viable spirochetes from blood or urine samples, and finally cases of clinical disease may support these hypotheses, although the available evidence remains limited and warrants further investigation. This review presents the current data on the incidence and pathogenesis of infections caused by *Leptospira* spp. in cats and their potential epidemiological role, including their possible contribution to environmental contamination and zoonotic transmission.

LANGUAGE OF ORIGINAL DOCUMENT: English

Marif H.F., Ali B.A., Husin S.O., Mohammed S.J., Ali M.H., Ali S.O.

Molecular detection and phylogenetic characterization of *Leptospira interrogans* in sheltered dogs from Iraq’s Kurdistan Region

(2026) Open Veterinary Journal, 16 (5), pp. 2911 - 2921

DOI: 10.5455/OVJ.2026.v16.i5.33

ABSTRACT: Background: Leptospirosis is a major worldwide health concern caused by pathogenic spirochetes from the genus *Leptospira*. Dogs are a significant reservoir host, particularly in shelter environments, where overcrowding and poor sanitation increase the risk of transmission. Aim: This study aimed to find *Leptospira* in protected dogs for the first time, define the leptospira molecularly, and perform a phylogenetic analysis to ascertain the similarities and differences in the sequenced gene among strains from nearby nations. Methods: Eighty blood and urine samples were collected from sheltered dogs under general anesthesia between May and August 2025. The samples were then subjected to DNA extraction and conventional polymerase chain reaction that targeted the conserved secY gene using phylogenetic analysis and sequencing. Results: Leptospirosis DNA was found in 23 samples (28.75%), including 11 urine samples

(13.75%) and 12 blood samples (15%). Male dogs aged 2–3 years had the highest incidence of infection (23.1%), whereas female dogs had the highest rate (23.5%). Conclusion: These results highlight the critical need for comprehensive surveillance programs, enhanced biosecurity procedures, and vaccination plans in shelter settings throughout the Kurdistan Region.

LANGUAGE OF ORIGINAL DOCUMENT: English

Wijayanto R., Puspitasari Y., Raharjo H.M., Fahlefi M.I.R., Zilfiarani C.N.

***Leptospira spp.* in bovine renal colonization and reproductive health: molecular mechanisms, pathogenesis, and global perspective**

(2026) *Advances in Animal and Veterinary Sciences*, 14 (4), pp. 826 - 838

DOI: 10.17582/journal.aavs/2026/14.4.826.838

ABSTRACT: Leptospirosis is a globally important zoonotic disease caused by bacteria of the genus *Leptospira*, and cattle act as major maintenance hosts sustaining environmental transmission. Although infections in cattle are often subclinical, the bacteria persist in the renal proximal tubules, enabling long-term urinary shedding and creating a continuous source of environmental contamination. This review integrates evidence that is typically examined in isolation pathogenesis, virulence factors, kidney colonization, immune evasion, and reproductive outcomes to explain how chronic renal infection drives reproductive failure in cattle. Mechanisms underlying renal persistence include crawling motility, strong adhesion to tubular extracellular matrix via LigA/LigB and related membrane proteins, and biofilm formation, which collectively protect the bacteria from immune clearance. These processes contribute to consistent renal lesions such as interstitial nephritis, glomerulonephritis, tubular necrosis, and fibrosis, yet provoke only limited inflammation, allowing lifelong colonization. Emerging molecular studies also demonstrate that *Leptospira* can colonize the uterus and placenta independently of renal infection, inducing IL-6 mediated inflammation that disrupts implantation, embryo development, and pregnancy maintenance. By linking renal colonization with reproductive pathology, this review highlights a unified pathogenic continuum that explains abortion, subfertility, weak calf syndrome, and repeat breeding observed in endemic herds. Understanding this continuum is crucial for improving control strategies. Mechanism-based approaches targeting motility, adhesion, biofilms, and chronic colonization offer promising avenues for next-generation vaccines and therapeutics, while One Health interventions remain essential for reducing environmental exposure. Chronic kidney infection is the pivotal driver of both persistent transmission and reproductive losses, forming the foundation for economic and epidemiological impact of bovine leptospirosis.

LANGUAGE OF ORIGINAL DOCUMENT: English

Christabel E.V., Musthofa F.A., Ferizal R., Ridhanya A., Siahaan K.B.P., Pasaribu A.I.

Myocarditis and septic shock as early manifestation of leptospirosis: case report

(2026) *Tropical Doctor*, in press

DOI: 10.1177/00494755261454742

ABSTRACT: Leptospirosis is a zoonotic infection predominantly affecting marginalized populations in tropical regions, often resulting from exposure to contaminated water or contact with animal reservoirs, especially rodents. The disease typically manifests in a biphasic nature; beginning with an incubation period ranging from several days to a few weeks, followed by a septicaemic phase, an interphase where symptoms resolve temporarily, and finally an immune phase. While most infections are mild, approximately 10% progress to

severe disease involving multi-organ complications, typically manifesting during the immune phase. We report a case of myocarditis and septic shock during the acute phase of leptospirosis.

LANGUAGE OF ORIGINAL DOCUMENT: English

Putz E.J., Fernandes L.G.V., Bayles D.O., Tibbs-Cortes B.W., Petry B., Sivasankaran S.K., Nally J.E.

Identification and characterization of small RNAs expressed by *Leptospira borgpetersenii* serovar Hardjo and their conservation in the genus *Leptospira*

(2026) BMC Microbiology, 26 (1), art. no. 516

DOI: 10.1186/s12866-026-05052-1

ABSTRACT: Background: Leptospirosis is a global zoonotic disease affecting humans, companion animals, and domestic livestock. Clinical presentation of disease is dependent on complex interactions between host species and pathogenic species, serovars, and strains of *Leptospira*. This is exemplified by *L. borgpetersenii* serovar Hardjo strains HB203 and JB197, which differ very little by genome content but cause divergent clinical disease phenotypes in the hamster model of leptospirosis. JB197 causes an acute lethal disease while HB203 establishes a chronic asymptomatic infection of the kidneys. Previous work has shown that *Leptospira* modify their gene expression in response to temperature. Results: RNA sequencing performed on serovar Hardjo strains HB203 and JB197 cultured at both 29°C and 37°C directly from experimentally infected hamsters identified 266 small RNAs (sRNAs) previously unannotated for *L. borgpetersenii*. Levels of expression for each novel candidate sRNA are reported: 67 and 10 sRNAs were differentially expressed between strains (at 29°C and 37°C respectively) while 32 and 10 were differentially expressed between temperature conditions (within JB197 and HB203 respectively). Conservation analysis of candidate sRNAs within the genus *Leptospira* identified a binomial distribution comprising highly conserved sRNAs such as JB_C1_N135/LIC1nc80 and JB_C1_N610 which are found in 42/43 pathogenic species compared to others such as JB_C1_N595 and JB_C1_N1040 which are restricted to strains of *L. borgpetersenii*. Conclusions: The nuances of what contributes to *Leptospira* strain-specific pathogenesis are poorly understood. Non-coding sRNAs have regulatory impacts on gene expression that can alter leptospire protein profiles, virulence factors, and host-pathogen interactions. Levels of conservation of these sRNAs within the genus *Leptospira* identified those that were highly conserved compared to others that were species-specific. Results emphasize the broad role that sRNAs play in regulating gene expression of *Leptospira*, and the potential for sRNAs to be used for clinical detection as well as species/serovar specific typing.

LANGUAGE OF ORIGINAL DOCUMENT: English

Porcalla J.M., Podiotan P.A.P., Gutierrez S.M.M., Distor N.T.

Bioinformatics-based B-cell epitope identification from *Leptospira interrogans* outer membrane proteins LIC11574 and LIC13411 for the rational development of a multi-epitope anti-*Leptospira* vaccine

(2026) Archives of Microbiology, 208 (8), art. no. 416

DOI: 10.1007/s00203-026-04922-6

ABSTRACT: Leptospirosis is a globally neglected zoonotic disease caused by the spirochete *Leptospira interrogans*, posing a major public health burden in tropical and subtropical regions. Although antibiotic therapy remains the primary treatment for most bacterial infections, *L. interrogans* has exhibited increasing resistance to antimicrobial agents, underscoring the need for alternative prophylactic strategies and prompting further research into B-cell peptide epitope-based vaccines as a long-term solution for disease control. This study

explored the outer membrane proteins LIC11574 and LIC13411 as sources of B-cell epitopes for rational vaccine development. Using bioinformatics and immune simulations, candidate epitopes were identified based on antigenicity, non-allergenicity, and immunogenicity. A total of 69 16-mer and 68 18-mer epitopes were identified in LIC11574, while LIC13411 yielded 112 16-mer and 123 18-mer epitopes. Structural investigation revealed that the identified B-cell peptide epitopes were predominantly located within α -helical regions, whereas the remaining sequences were distributed across β -sheet structures and loop regions. The top-ranked B-cell peptide epitopes of LIC11574 and LIC13411, selected for their antigenic and non-allergenic characteristics, were successfully docked with the HLA-DRB1*15 molecule, exhibiting promising binding affinities ranging from - 12.6 to - 14.9 kcal/mol. Immune simulations also revealed that the constructed multi-epitope vaccines induced B-cell and helper T-cell activities, indicating a favorable host immune response. These findings support LIC11574 and LIC13411 as promising sources of B-cell peptide epitopes for the development of multi-epitope vaccines against leptospirosis. Further studies should validate their immunogenicity in vivo, optimize delivery systems, and assess stability.

LANGUAGE OF ORIGINAL DOCUMENT: English

Arivazhagan A., Rajendran V.O., Vinodkumar K., Vinodhkumar K.A., Premkumar D., Chawhan P., Lepcha N.S., Kumar B., Suresh K.P., Gulati B.R., Balamurugan V.

Spatio-temporal ensemble machine learning forecasts of animal leptospirosis in enzootic Indian States using integrated environmental predictors

(2026) Veterinary research communications, 50 (4)

DOI: 10.1007/s11259-026-11294-1

ABSTRACT: Leptospirosis is a significant zoonotic disease in India, with Gujarat and Karnataka recognised as enzootic states experiencing recurrent animal and human outbreaks. This study applied a spatio-temporal ensemble machine learning framework to monthly animal leptospirosis surveillance data from these regions, integrating satellite-derived environmental predictors. Environmental variables were aligned with surveillance data and processed into continuous monthly time series. Three base regression models, Random Forest (RF), Extreme Gradient Boosting (XGB), and a feed-forward neural network (FFNN) were developed and combined using weighted and stacked meta-ensemble approaches. Model performance was evaluated using Root Mean Square Error (RMSE), Mean Absolute Error (MAE), and the coefficient of determination (R^2), and baseline models including linear regression and climatological means were used for comparison. Across both states, the feed-forward neural network performed best among base learners, while the stacked meta-ensemble achieved the lowest prediction errors. However, the near-perfect performance observed ($R^2 \approx 1.000$) should be interpreted cautiously given the limited dataset, passive surveillance data structure, and potential temporal autocorrelation. The models developed in this study therefore forecast reported surveillance cases rather than true disease incidence. SHAP-based feature attribution identified rainfall at short temporal lags as the dominant predictor, with additional contributions from vegetation dynamics. These findings demonstrate the feasibility of integrating environmental predictors with passive surveillance data for short-term forecasting and early warning of leptospirosis risk in data-limited endemic regions. However, the framework should be considered a methodological and exploratory modelling approach rather than a fully operational forecasting system until longer surveillance time series and external validation are available.

LANGUAGE OF ORIGINAL DOCUMENT: English

Dirsmith K.L., Nally J.E., Sutherland G., Hamond C., Galloway R.L., LeCount K., Anderson T., Soltero F.V., Rivera-García S., Novak V., Olivieri-Cintrón G.E., Gruver K., Brown V.R., Glassey C., McKinley A.S., Candelaria O., Stephens L., Schafer I.J.

***Leptospira* species infection and seropositivity in domestic livestock and feral swine in Puerto Rico**

(2026) *Transboundary and Emerging Diseases*, 2026 (1), art. no. 2538118

DOI: 10.1155/tbed/2538118

ABSTRACT: Leptospirosis is a zoonotic disease of global importance that significantly impacts human health and the livestock industry. In Puerto Rico, outbreaks of leptospirosis in humans have been associated with hurricanes and subsequent flooding events. Rodent species in Puerto Rico and feral swine in the continental United States have been implicated as reservoir hosts for *Leptospira* species and serogroups, with the possibility of transmitting the pathogen to humans. In this cross-sectional investigation, we collected samples from 670 animals, including 375 feral swine, 168 transitional swine, 120 dairy cattle, six beef cattle, and one small ruminant to assess *Leptospira* spp. exposure and infection in specific regions of Puerto Rico. Of all animals sampled and tested, 55.82% (n = 374) had a positive result to at least one of the following leptospirosis tests performed: microscopic agglutination test (MAT), polymerase chain reaction (PCR), fluorescent antibody test (FAT), and/or culture. Of all animals from which serum samples were tested, 75.90% (n = 126) of transitional swine, 78.72% (n = 37) of dairy cattle, 100% (n = 4) of beef cattle, and 53.13% (n = 195) of feral swine had detectable *Leptospira* antibodies on MAT. Of all animals from which urine samples were collected and tested on either lipL32 PCR or FAT, 0% of transitional swine, 22.86% (n = 24) of dairy cattle, 16.67% (n = 1) of beef cattle, and 1.71% (n = 2) of feral swine tested positive for *Leptospira* species on one or both of these tests. *L. borgpetersenii* serogroup Sejroe serovar Hardjo was isolated from the urine of two dairy cows, and *L. santarosai* serogroup Pyrogenes was isolated from the urine of another dairy cow. The findings of this investigation provide valuable information on the circulating *Leptospira* species, serogroups, and serovars in domestic livestock and feral swine in specific regions of Puerto Rico and will further inform human and animal disease prevention, preparedness, and response.

LANGUAGE OF ORIGINAL DOCUMENT: English

Barragán-Peña A.E., Paredes-Núñez D., Jimenez Valenzuela F., Orlando S.A., Carvajal E., Rodriguez-Pazmiño A.S., Garcia-Bereguian M.A.

Diagnostic performance of two commercial qPCR kits for *Leptospira* spp. detection

(2026) *Tropical Medicine and Infectious Disease*, 11 (5), art. no. 119

DOI: 10.3390/tropicalmed11050119

ABSTRACT: Early confirmation of leptospirosis is essential for prompt antimicrobial treatment, and PCR-based diagnosis has been reported as a highly sensitive method during the acute phase in the first week since the symptom's onset. We evaluated the diagnostic performance of two commercial real-time PCR assays—Viasure *Leptospira* Real-Time PCR (Certest Biotec, Spain) and Genesig Advanced *Leptospira* spp. (Primerdesign, UK) against an in-house qPCR assay targeting lipL32 as the reference method. A retrospective comparative evaluation was conducted on 235 human EDTA-blood samples obtained during the acute phase of clinical presentation suspected of leptospirosis. The in-house qPCR reference assay detected 55 positive and 180 negative samples, and both commercial kits accurately classified every specimen, achieving 100% sensitivity (95% CI: 93.5–100), 100% specificity (95% CI: 98.0–100), and 100% overall accuracy. In

conclusion, both commercial qPCR kits offer high accuracy for the early detection of pathogenic *Leptospira* in human blood samples.

LANGUAGE OF ORIGINAL DOCUMENT: English

Hart S., Smith S., Nash B., Stratton H., Rosengren P., Goud R.S., Tacon C., Hanson J.

The management and clinical course of patients admitted to the intensive care unit with leptospirosis in a referral hospital in Far North Queensland, Tropical Australia

(2026) *Acta Tropica*, 279, art. no. 108154

DOI: 10.1016/j.actatropica.2026.108154

ABSTRACT: Background: The case-fatality rate of patients with leptospirosis requiring intensive care unit (ICU) admission in resource-limited settings can exceed 50%. However, the optimal care of critically ill patients with this life-threatening infection is incompletely defined. Methods: This retrospective study examined the demographic, clinical, laboratory and imaging findings in consecutive individuals with a laboratory-confirmed diagnosis of leptospirosis admitted to the ICU of an Australian referral hospital between May 2015 and April 2025. The care provided to the patients was correlated with their clinical course. Results: The median (interquartile range, IQR) of the 60 individuals was 43 (26-65) years; 49/60 (82%) had no pre-existing comorbidity. The patients' median (IQR) APACHE-III score was 63 (46-89). Multi-organ dysfunction was common: 48/60 (80%) needed vasopressor support, a lung protective ventilation strategy was employed in the 16/60 (27%) requiring mechanical ventilation and renal replacement therapy was initiated in 12/60 (20%) using standard indications. Two patients received extracorporeal membrane oxygenation. While awaiting a diagnosis of leptospirosis, patients were managed using contemporary principles of sepsis care: all 60 patients received antibiotics, fluid resuscitation was conservative and transfusion of blood products was restrictive. Corticosteroids were provided to 23/60 (38%), but this was usually short course hydrocortisone therapy for blood pressure support. All 60 patients survived to discharge and were alive 90 days later. Conclusions: Leptospirosis can cause life-threatening multi-organ failure in young people without comorbidity. However, in Australia's well-resourced health system, excellent outcomes can be achieved using standard principles of sepsis management before the diagnosis is confirmed.

LANGUAGE OF ORIGINAL DOCUMENT: English

Saranya N.S.S., Ramesh R., Krishnamoorthy V., Ranganathan L.N., Shanmugam S., Hazeena P., Todur V.N.

Para infectious myelitis with *Conus medullaris* immunotropism in the immune phase of leptospirosis infection: clinical pattern and in silico molecular mimicry analysis based biological plausibility

(2026) *Journal of Neuroimmunology*, 418, art. no. 578988

DOI: 10.1016/j.jneuroim.2026.578988

ABSTRACT: Background Neurological involvement in leptospirosis but increasingly recognized, with myelitis representing a disabling complication. *Conus medullaris* involvement has not been systematically described and may reflect region-specific vulnerability to immune-mediated injury, post leptospirosis infection. Methods We report a case series of three patients with serologically confirmed leptospirosis who developed acute myelitis during the immune phase, with radiological involvement of the conus medullaris. Clinical, cerebrospinal fluid, and imaging features were analyzed. A proteome-wide in silico comparison was performed between human myelin oligodendrocyte glycoprotein and the *Leptospira* interrogans proteome to identify shared antigenic motifs. Results All patients presented with acute bladder dysfunction, lower limb weakness, or

sensory symptoms following a febrile illness. Magnetic resonance imaging showed conus medullaris involvement, either isolated or as part of longitudinal cord lesions. Cerebrospinal fluid revealed inflammatory changes. Treatment with steroids, with adjunctive immunotherapy in severe cases, resulted in clinical improvement. In silico analysis did not demonstrate full-length homology but identified 19 shared peptide motifs with moderate sequence identity, several overlapping predicted B-cell and T-cell epitope regions. Conclusions This series suggests a possible para-infectious conus-predominant myelitis pattern in leptospirosis. The identification of shared antigenic motifs provides biological plausibility for immune-mediated demyelination through molecular mimicry. Recognition of this pattern in endemic regions may facilitate early diagnosis and timely immunotherapy.

LANGUAGE OF ORIGINAL DOCUMENT: English

Kularathna M.D.S.V., Kularatne S.A.M.

Clinical experience of therapeutic plasma exchange (TPE) in severe leptospirosis: a case series from Sri Lanka (2026) *Tropical Medicine and Infectious Disease*, 11 (5), art. no. 132

DOI: 10.3390/tropicalmed11050132

ABSTRACT: Background: Leptospirosis is a globally prevalent zoonosis with significant morbidity and mortality, especially in tropical regions like South Asia. In its severe form, the disease often leads to multiorgan dysfunction, with pulmonary haemorrhage being a major cause of death. Evidence supporting specific treatments for severe leptospirosis with pulmonary involvement remains limited. Recent studies suggest that immunomodulatory therapies, such as therapeutic plasma exchange (TPE), may offer survival benefits. This case series explores the application and outcomes of TPE in patients with severe leptospirosis at a tertiary care hospital in Sri Lanka. Methods: We studied a case series involving nine patients with confirmed severe leptospirosis and multiorgan involvement from September 2021 to October 2022. All patients received standard care, including intravenous antibiotics and methylprednisolone. TPE was initiated in all nine patients based on clinical severity, particularly in the presence of pulmonary haemorrhage. Clinical, laboratory, and radiological data were collected from patient records and follow-up. Leptospirosis diagnosis was confirmed through ELISA IgM testing. TPE decisions were made by a multidisciplinary team. Results: Of the nine patients who received TPE, seven survived (78%). Pulmonary haemorrhage was the primary indication for TPE in all cases. All patients had multiorgan involvement: renal failure (89%), hepatic dysfunction (55%), and myocarditis (67%). Mortality was associated with inotropic-dependent myocarditis and mechanical ventilation at TPE initiation. Patients requiring intubation had a 50% mortality rate, compared to 14% in those who were not intubated. Non-survivors also had significantly elevated lactate levels (>4 mmol/L) and worsening acid–base status. Four patients required dialysis: three survived. Conclusions: Early initiation of TPE may be safe and beneficial in severe leptospirosis, and future randomised controlled studies are necessary to examine its benefits further. These findings are hypothesis-generating for further research, particularly on patient selection for TPE.

LANGUAGE OF ORIGINAL DOCUMENT: English

Merican M.N.M.A., Isa Z.M., Hod R., Ibrahim R., Seman Z., Rashid R.A.

Development of a mobile app (MyLepto App) to improve knowledge, attitude, and practice regarding leptospirosis among wet market workers in Selangor, Malaysia: protocol for a quasi-experimental study (2026) *JMIR Research Protocols*, 15 (1), art. no. e75809

DOI: 10.2196/75809

ABSTRACT: Background: Leptospirosis is the most common zoonotic cause of mortality, with most of its burden occurring in tropical regions and low-income countries. It is endemic in Southeast and South Asian nations. Leptospirosis outbreaks occur after natural disasters. In Malaysia, the e-notification system of the Communicable Diseases Control Information System recorded 5217 leptospirosis cases in 2019 with 32 fatalities. The incidence rate was 15.61 per 100,000 people. Male individuals comprised 67% of leptospirosis cases, while people aged 25 to 55 years accounted for 45% of the cases. Information and perception are crucial in influencing positive behavior. Nonetheless, information on urban and rural people's knowledge, attitude, and practice (KAP) regarding the incidence of leptospirosis is limited. Objective: We aimed to develop a mobile app with information on leptospirosis and measure its effectiveness in improving KAP regarding leptospirosis among wet market workers in Selangor, Malaysia. Methods: A 3-phase study will be conducted and includes development of a mobile app containing information about leptospirosis, analysis of its acceptability, and application of the intervention. Participants will be recruited based on specific inclusion criteria by using purposive sampling. Four wet markets in Hulu Langat district, Selangor, will be selected according to a list provided by local municipal councils. The respondents from each selected wet market will be workers aged 18 years and older. Mobile app development will begin with an idea description, storyboard creation, and content approval through the nominal group technique. The mobile app content will be constructed using the Health Belief Model theory. Subsequently, the usability of the mobile app prototype will be evaluated using the validated Malay version of the System Usability Scale questionnaire for the evaluation of mobile apps. This protocol entails a 12-week intervention stage, in which the baseline assessment is regarded as a pretest evaluation and the follow-up assessment as a posttest evaluation. Participant selection will be based on the inclusion and exclusion criteria. This study will incorporate a set of validated questionnaires created by a group of leptospirosis experts. The validated questionnaire will comprise 9 sections with open-ended questions on sociodemographic data, KAP, and mobile app requirements. Results: Mobile app development and usability testing were completed between January 2024 and March 2025. Participant recruitment is scheduled in April to May 2025 after submission of this manuscript, with the 12-week intervention and data collection running from May to July 2025. As of manuscript submission, recruitment, data collection, and data analysis have not yet begun. Data analysis is expected to be completed by September 2025, and results are anticipated for publication in late 2025. Conclusions: Due to the high number of reported leptospirosis cases in the Hulu Langat district, Selangor, this intervention study will be conducted there. The development of the mobile app may contribute to improving wet market workers' KAP regarding leptospirosis. LANGUAGE OF ORIGINAL DOCUMENT: English

Desmoulin A., Deparis X., Kuli B., Raffray L., Mosnier E.

Reunion's bold bet against leptospirosis

(2026) *Clinical Microbiology and Infection*, 32 (7), pp. 1039 - 1041

DOI: 10.1016/j.cmi.2026.03.029

LANGUAGE OF ORIGINAL DOCUMENT: English

Fernandez M., Vernel-Pauillac F., Pezier T., Lacroix-Lamandé S., Werts C.

Trained immunity agonists given to neonatal mice fail to protect against leptospiral infection in adulthood and may cause adverse effects

(2026) *Innate immunity*, 32, pp. 17534259261455983

DOI: 10.1177/17534259261455983

ABSTRACT: Background and Objectives Trained immunity (TI) refers to a non-specific, long-lasting protective immune response that occurs following initial stimulation of the immune system and thought to be largely mediated by functional reprogramming of myeloid cells. TI has been demonstrated in BCG-vaccinated infants and can be induced in human cells and adult mice via agonists of pattern recognition receptors (PRR), such as β -glucan or MDP (a muropeptide that activates NOD2). However, its induction in neonates remains poorly understood. Previously, we demonstrated that the synthetic TLR2-NOD2 dual agonist CL429 enhances antimicrobial functions in adult mice and protects against subsequent infection with *Leptospira interrogans*, a zoonotic pathogen. We also demonstrated the immediate protective benefits of NOD2 stimulation in neonates against *Cryptosporidium*, a zoonotic pathogen that affects young animals in livestock herds. However, whether NOD2 agonists can induce TI in neonates and protect them at adulthood is unknown. Methods and Results Here, we investigated whether exposure of neonatal mice to PRR agonists (CL429, MDP or β -glucan), administered intraperitoneally at one week interval at 7/14 or 14/21 days of age, could enhance inflammatory cytokines production after ex vivo restimulation and confer long-term protection into adulthood. Surprisingly, none of the treatments enhanced ex vivo cytokine responses in adulthood after restimulation, nor did they confer protection against experimental leptospirosis. Instead, MDP-treated neonates exhibited 50% mortality following adult infection, revealing an unexpected detrimental effect. Conclusion These findings demonstrate that these PRR agonists fail to induce protective TI against *Leptospira* when administered to neonatal mice, challenging assumptions derived from adult models. Furthermore, our study reveals the risks of administering immunostimulants during the early stages of life, and highlights unanticipated and potentially harmful, PRR- and age-specific mechanisms of immune system modulation.

LANGUAGE OF ORIGINAL DOCUMENT: English

Singh M.P., Kumaraswamy R.

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***Leptospira*-associated tubo-ovarian abscess in an endometrioma: a rare case report**

(2026) Journal of Obstetrics and Gynecology of India, in press

DOI: 10.1007/s13224-026-02354-2

ABSTRACT: Case: A 42-year-old lady presented to the OPD with pyrexia of unknown origin, cough, and lower abdominal pain. Clinically, she was febrile and had a tender pelvic mass. Flu panel was negative with evidence of leptospira IgM being strongly positive. Scan confirmed a large left tubo-ovarian abscess in an endometrioma. Laparoscopic drainage and excision of the abscess with left salpingo-oophorectomy with were done. Postoperatively, she was given complete course of antibiotics and recovered well within 48 h. Discussion: Endometriosis is a chronic inflammatory state mostly seen in reproductive age group of women. Blood being a perfect culture medium for the growth of pathogens allows infections to grow, especially in states of low immunity. Hematogeneous spread from distant sites like lungs, liver, or ascending infections via vagina is possible routes of infection in an endometrioma. Conclusion: If the infection is not treated timely, it may lead to abscess and further sepsis, needing fertility compromising surgeries like salpingectomy, oophorectomy. Hence, proper counseling and follow-up of patients with endometriosis are essential.

LANGUAGE OF ORIGINAL DOCUMENT: English

Manyullei S., Mangedong S., Natsir M.F., Nasrah N.

Environmental sanitation and household rodent presence among suspected leptospirosis cases: findings from Makassar, Indonesia

(2026) Media Publikasi Promosi Kesehatan Indonesia, 9 (5), pp. 901 - 914

DOI: 10.56338/mppki.v9i5.9143

ABSTRACT: Introduction: Leptospirosis is a zoonotic disease caused by the bacterium *Leptospira interrogans*. Residential areas frequently experience poor environmental sanitation, including waste accumulation, stagnant water, and rodent activity around households. Such conditions compromise environmental hygiene and facilitate the survival of *Leptospira* bacteria. Poor sanitation increases community exposure to environmental sources of infection, thereby elevating the risk of leptospirosis. Exposure may occur through direct or indirect contact with contaminated water or soil, particularly when stagnant water is contaminated with rodent urine. This study aimed to assess household rodent presence among suspected leptospirosis cases and to examine its association with environmental sanitation conditions. Polymerase chain reaction (PCR) testing and GIS-based spatial mapping were incorporated to support diagnostic and spatial interpretation. Methods: This study employed a quantitative, descriptive cross-sectional observational design. The sample comprised 20 households of suspected leptospirosis patients selected through purposive sampling. Data were collected through direct household observation using a structured checklist. Results: Chi-square analysis indicated no statistically significant associations between sanitation indicators and signs of rodent presence, including stagnant water ($p = 0.068$), waste accumulation ($p = 0.068$), rodent entry pathways ($p = 0.178$), drainage condition ($p = 0.305$), and wastewater disposal systems (SPAL) ($p = 0.136$). All examined variables demonstrated p-values greater than 0.05, indicating no statistically significant associations with observable rodent indicators. Nevertheless, the SPAL variable showed a non-significant trend toward association ($p = 0.136$), although it did not reach the conventional 5% significance threshold. Conclusion: No statistically significant relationships were identified between household sanitation conditions including stagnant water, waste accumulation, drainage condition, wastewater disposal systems (SPAL), and clean water availability and signs of rodent presence. To mitigate rodent-related environmental health risks, communities are encouraged to improve environmental hygiene through proper waste management, routine maintenance of drainage systems, and the implementation of household-level rodent control measures. © 2026, Muhammadiyah Palu University. All rights reserved.

LANGUAGE OF ORIGINAL DOCUMENT: English

de Freitas Amorim J.J., Nardotto Moraes D.D.P., Netto Chaves L., Dias Lopes S., Ho Y.-L.

Predictors of in-hospital mortality in severe leptospirosis: a retrospective cohort study (São Paulo, 2017–2025)

(2026) Infection

DOI: 10.1007/s15010-026-02845-4

ABSTRACT: Purpose: Although advances in intensive care have improved survival of patients with severe leptospirosis, it remains with high mortality. We aimed to identify factors associated with in-hospital mortality among patients with severe leptospirosis admitted to a tertiary intensive care unit. Methods: We conducted a retrospective cohort study of adults with leptospirosis admitted to the ICU of a tertiary referral hospital in Brazil, between January 1, 2017, and March 3, 2025. Demographic, clinical, laboratory, and intensive care support variables were collected. The primary outcome was in-hospital mortality. Multivariable logistic regression

models were used to identify independent predictors of death. Results: Forty-four patients were included; median age was 42 years, and 95.5% were male. In-hospital mortality was 20.5% (9/44). Severe multiorgan dysfunction was common; 56.8% of patients required renal replacement therapy and invasive mechanical ventilation in 43.2%. In the clinical multivariable model, alveolar hemorrhage (aOR 7.91, 95% CI 1.07–58.61) and arrhythmia (aOR 13.82, 95% CI 2.06–92.64) were independently associated with death. In the laboratory-based model, urea > 180 mg/dL (aOR 9.01, 95% CI 1.36–59.65) and platelet count < 45 × 10³/mm³ (aOR 14.07, 95% CI 1.40–141.88) were independently associated with mortality. Conclusion: In this contemporary ICU cohort, mortality in severe leptospirosis was primarily driven by respiratory and cardiac complications rather than isolated renal dysfunction. Although renal failure remained a marker of severity, its prognostic impact appeared attenuated by timely renal replacement therapy.

LANGUAGE OF ORIGINAL DOCUMENT: English

da Silva Martins A., Silva T.A., Heinemann M.B., Guedes Barbosa I., Soares Rodrigues R., Dias R.A., Passos Farias R., Braga Menezes R., dos Santos Carlini Cunha F.C., Borsanelli A.C.

Seroprevalence of *Leptospira* in Lavradeiro horses, a semi-feral ecotype from the Northern Brazilian Amazon

(2026) Veterinary Research Communications, 50 (5), art. no. 381

DOI: 10.1007/s11259-026-11328-8

ABSTRACT: Leptospirosis is a neglected zoonosis with significant impact on public and veterinary health, with equines acting as potential maintenance hosts of infection. This study aimed to investigate the seroprevalence of *Leptospira* in Lavradeiro horses under semi-feral conditions in Indigenous communities in the state of Roraima, Brazil. A total of 387 serum samples were subjected to the microscopic agglutination test (MAT), using antigens of *Leptospira* spp. from 18 serogroups. The overall prevalence was 15.8% (95% CI: 12.3–19.8%), with the most frequent serogroups being Australis, Tarassovi, Autumnalis, and Pomona. Seropositivity was higher among adult animals (17.6%) than foals (9.8%), although not statistically significant. Between sexes, there was no significant difference in positive females (16.8%) and males (14.7%). Horses that lived in areas that were likely to flood had a higher seroprevalence (23.6%). Titers of 800 or higher were found in 23 animals, most of which were from the municipality of Pacaraima. The Australis serogroup was the most common in this group. This study reports the first evidence of *Leptospira* exposure in Lavradeiro horses, with higher seroprevalence in flood-prone areas and reactivity to uncommon serovars. Our findings highlight pathogen circulation in equine under semi-feral conditions and the need for integrated surveillance and conservation of the Lavradeiro horse in the Northern Brazilian Amazon.

LANGUAGE OF ORIGINAL DOCUMENT: English

Mora Jaramillo N., Orlando Solon A., Echeverría J., Zuñiga Velarde J.J., Paredes-Nuñez D., Barragan Peña A., Garcia-Bereguain M.A.

A first insight into the diversity of pathogenic *Leptospira* serogroups in human cases from Ecuador

(2026) Acta Tropica, 280, art. no. 108169

DOI: 10.1016/j.actatropica.2026.108169

ABSTRACT: With an estimated global incidence of nearly one million cases and nearly 60,000 associated deaths annually, leptospirosis is recognized as one of the most widespread zoonotic diseases worldwide. In Latin America, leptospirosis remains endemic and neglected, with recurrent outbreaks linked to climatic

variability, flooding, and close human–animal–environment interactions. In this region, Brazil, Peru, Colombia, and Ecuador account for nearly 80% of leptospirosis reported cases. Despite advances in molecular diagnostics and species-level identification, serogroups remain central to leptospirosis epidemiology because they often exhibit preferential associations with specific animal hosts and geographic patterns making them useful indicators for inferring transmission pathways. However, the information about the *Leptospira* serogroups circulating in human cases in Ecuador is not available. In this study, we report for the first time the *Leptospira* pathogenic serogroups prevalence and diversity in human from cases diagnosed at the National Reference Center for Zoonoses of Ecuador. A total of 371 febrile patients suspected of leptospirosis were analyzed by microagglutination test, and 121 (32.6%) were positive and reported as human leptospirosis cases by the Ministry of Health. Without excluding potential cross-reactivity, a total of 14 *Leptospira* serogroups were identified, the most frequently detected been Bataviae (13.5%; 95% CI: 10.2–17.4), Sejroe (9.4%; 95% CI: 6.7–12.9), and Grippotyphosa (5.7%; 95% CI: 3.5–8.5). Comparison with published reports of *Leptospira* serogroups circulation in animal species in Ecuador revealed broad overlap between human serogroups and those detected in local animal reservoirs, underscoring the urgent need to address leptospirosis surveillance and control in Ecuador from a One Health perspective.

LANGUAGE OF ORIGINAL DOCUMENT: English

Adhinugraha K., Ciptaningtyas Rizke V., Hapsari R., Wisudiawan G.A.A., Lestari W.D., Hutapea J.B.M.P., Pakpahan S.B., Taniar D.

An integrated case–based leptospirosis surveillance dataset with environmental context from a tropical coastal city in Indonesia, 2018–2023

(2026) Data in Brief, 67, art. no. 112930

DOI: 10.1016/j.dib.2026.112930

ABSTRACT: This dataset contains anonymised leptospirosis surveillance records collected in Semarang, Central Java, Indonesia between 2018 and 2023. Case data were derived from routine public health surveillance conducted by community health centre teams. The primary dataset includes patient demographic characteristics, case classification status, documented clinical events expressed as day offsets relative to registration date, exposure history to standing and contaminated water, animal contact variables, personal protective equipment usage, bathing practices, wound conditions, and household environmental characteristics. Spatial context is provided at the kelurahan level, the smallest formal government administrative unit in Indonesia with defined spatial boundaries, enabling geospatial analysis while preserving individual privacy. Secondary contextual datasets include administrative boundaries, land use classification, healthcare facility locations, flood related indicators, population statistics, and monthly weather variables such as temperature, relative humidity, and rainfall. Personally identifiable information and direct healthcare facility identifiers were removed prior to dataset construction. This dataset supports research in disease surveillance, spatial epidemiology, environmental health, zoonotic transmission, and climate sensitive disease modelling in tropical urban settings.

LANGUAGE OF ORIGINAL DOCUMENT: English

Bringold C., Schweighauser A., Walther S., Lassen-Schmidt B., Gendron P.K., Francey T.

Serial evaluation of clinical, functional, and structural pulmonary changes in 10 dogs with leptospirosis

(2026) Journal of veterinary internal medicine, 40 (3)

DOI: 10.1093/jvimsj/aalag101

ABSTRACT: **BACKGROUND:** Leptospirosis is a worldwide zoonosis with multisystemic consequences, including the pulmonary hemorrhage syndrome associated with a high mortality rate in dogs. **HYPOTHESIS/OBJECTIVES:** Serial assessment of clinical, functional, and structural pulmonary changes in dogs with acute leptospirosis during the first 8 days of hospitalization. **ANIMALS:** Ten client-owned dogs diagnosed with leptospirosis. **METHODS:** Prospective, descriptive case series with daily clinical examination, arterial blood gas analyses on d1-4, d6, and d8 and thoracic computed tomography (CT) with pulmonary segmentation and lung densitometry analysis on d1, d4, and d8. **RESULTS:** Clinical respiratory impairment was observed in most dogs during the measurement period, including 1 dog with fatal pulmonary hemorrhage. Half of the dogs showed hypoxemia (arterial partial pressure of oxygen: median, 56.6 mmHg; range, 49.6-67.8 mmHg) with increased alveolar-arterial PO₂ gradient (A-a gradient) (37.9 mmHg [21.9-405.4 mmHg]) over the study period. Alveolar ventilation was only minimally affected (arterial partial pressure of carbon dioxide 35.2 mmHg [25.9-42.1 mmHg]). Quantitative CT analyses identified increased mean lung attenuation (MLA) in all dogs initially (-612 HU [-475 to -681 HU]) with progressive improvement in most dogs (d4: -646 HU [-583 to -746 HU]; d8: -709 HU [-624 to -811 HU]). Whereas clinical score and CT changes improved progressively in most dogs, the blood gas results showed a fluctuating pattern. **CONCLUSIONS AND CLINICAL IMPORTANCE:** The clinical pulmonary manifestations of these dogs with leptospirosis were characterized by hypoxemia, increased A-a gradient, and increased lung density. The clinical course seemed to more closely parallel the structural changes observed on CT rather than the functional alterations assessed with arterial blood gas analyses.

LANGUAGE OF ORIGINAL DOCUMENT: English

Vinetz J.M., Flaxman L.

Isolated nausea and pretibial rash in a returning traveler: forme fruste of leptospirosis

(2026) American Journal of Tropical Medicine and Hygiene, 114 (6), pp. 1062 - 1065

DOI: 10.4269/ajtmh.26-0120

ABSTRACT: Leptospirosis is difficult to diagnose because of protean nonspecific clinical manifestations and the lack of rapid, actionable laboratory testing. A previously healthy woman who presented with nausea is described in the present study. She had modestly elevated liver function tests, an unusual pretibial rash, and no fever. She had recently swum in a waterfall in Costa Rica. After the clinicians proposed a leptospirosis diagnosis to the patient, an artificial intelligence program was selected for use by the clinicians to enhance confidence in proposing a rare and unknown diagnosis. The program independently produced a differential diagnosis that led with leptospirosis. Presumptive doxycycline administration led to symptom resolution. Blood (but not urine) Polymerase chain reaction (PCR) test for the LipL32 gene and a novel antibody detection test confirmed leptospirosis. This case represents an unusual clinical presentation of leptospirosis, including the absence of fever, the presence of a pretibial rash, and isolated, mildly elevated bilirubin and transaminases as sole laboratory abnormalities, and highlights difficulties associated with making a rapid, actionable diagnosis.

LANGUAGE OF ORIGINAL DOCUMENT: English

Latigay J.G., Gonzaga A.C.

A hybrid prophet-XGBoost model for weekly leptospirosis forecasting in the Philippines

(2026) Proceedings of the International Colloquium on Signal Processing and Its Applications, CSPA, 2026-May (2026), pp. 148 - 153

DOI: 10.1109/CSPA68262.2026.11517740

ABSTRACT: Epidemiological signals, such as weekly cases of Leptospirosis ($y[t]$), function as non-stationary discrete-time signal that follows predictable seasonal patterns frequently disrupted by unpredictable spikes caused by several external environmental factors, most notably severe weather, especially for the Philippines. Traditional forecasting methods tend to oversmooth this signal, effectively capturing the long-term trend but missing sharp peaks that define an outbreak. To address this, we propose a novel Hybrid Prophet-XGBoost Residual Learning Framework. The architecture splits the signal $y[t]$ into two main parts: a stable seasonal baseline and complex error signals modeled by Prophet and XGBoost, respectively. By training XGBoost to learn the relationship between environmental triggers and these residuals, the system recovers outbreak intensity that the standard model misses. Rolling-origin validation shows that this hybrid approach significantly outperforms statistical baselines, improving MAE by roughly 30% and RMSE by 23%, and is the only model that remained stable when evaluated during peak outbreaks. SHAP analysis corroborates this and shows that the model successfully isolates meaningful patterns, achieving high accuracy without sacrificing interpretability.

LANGUAGE OF ORIGINAL DOCUMENT: English

Mwongela J.M., Kanyiri C., Kitetu V.

Mathematical modeling of leptospirosis with misdiagnosis

(2026) Journal of Applied Mathematics, 2026 (1), art. no. 5513951

DOI: 10.1155/jama/5513951

ABSTRACT: Leptospirosis is a widespread zoonotic bacterial disease that continues to pose a major public health challenge, particularly in developing countries where it causes substantial morbidity, mortality, and economic losses. A key problem in controlling the disease is misdiagnosis, which delays appropriate treatment and facilitates continued transmission. Understanding the impact of diagnostic errors is therefore critical for effective disease management and policy planning. In this study, a compartmental epidemic model was developed to examine the effects of misdiagnosis on the transmission dynamics of leptospirosis. The model incorporates disease progression, treatment, and misdiagnosis pathways and was rigorously analyzed for positivity, boundedness, equilibrium points, and their stability properties. The basic reproduction number was derived using the next-generation matrix approach, and numerical simulations were carried out using MATLAB to support the analytical findings. The results show that increased rates of misdiagnosis significantly raise the effective reproduction number, accelerate disease spread, and weaken the effectiveness of treatment interventions. These findings demonstrate that diagnostic accuracy plays a crucial role in leptospirosis control and that failure to correctly diagnose cases can undermine public health efforts. The study underscores the importance of improved diagnostic tools, enhanced clinical awareness, and timely treatment in reducing disease transmission and informing effective intervention strategies for health practitioners, policymakers, and public health organizations.

LANGUAGE OF ORIGINAL DOCUMENT: English

Das S., Chakrabarti S., Roy S.K., Khandelwal R., Tiwari S.C., Tiwary I.K.

Thromboelastography guided restrictive transfusion therapy in a child with *Leptospira* induced hemophagocytic syndrome

(2026) Indian Journal of Pediatrics, in press

DOI: 10.1007/s12098-026-06244-3

LANGUAGE OF ORIGINAL DOCUMENT: English

Irshad A.U.R., Ullah N., Hassaballa A.A., Jeelani M.B., Fatima N.

Fractional-order sensitivity analysis of leptospirosis treatment dynamics in the presence of an environmental bacterial reservoir with artificial neural network support

(2026) Fractals, art. no. 2740010, in press

DOI: 10.1142/S0218348X2740010X

ABSTRACT: In this study, we develop and analyze a deterministic fractional-order human–animal–environment transmission model using the Caputo fractional-order derivative (CFOD) to investigate leptospirosis transmission dynamics, explicitly incorporating treatment for infected humans in the human population. The model accounts for indirect transmission through an environmental bacterial reservoir and shedding from infected animals. The qualitative features of the suggested model, such as positivity, boundedness, existence and uniqueness of solution, equilibrium points, and biological well-posedness of the solutions, are thoroughly demonstrated. The model captures nonlocal and memory-dependent characteristics that cannot be described by classical integer-order derivatives. The next-generation matrix (NGM) approach is used to determine the basic reproduction number (\mathcal{R}_0). The stability properties of the pathogen-extinction steady state and sustained-transmission steady state are investigated. In particular, Lyapunov function techniques are used to check the global stability of the PESS and STSS under suitable conditions, while Ulam–Hyers stability is established to examine the stability of the model solutions under small perturbations. To better understand the influence of model parameters, normalized forward sensitivity analysis is performed, showing that transmission, treatment, and recovery-related parameters exert the strongest influence on disease burden. Numerical simulations are used to verify theoretical results and investigate the effects of key epidemiological parameters on disease transmission. Finally, an artificial neural network (ANN) is employed only as a supplementary computational tool to reproduce the numerically obtained solution trajectories and to provide a consistency check of the computed results. The findings offer a valuable perspective on the dynamics of leptospirosis transmission and could inform disease control and intervention efforts.

LANGUAGE OF ORIGINAL DOCUMENT: English

Koundal P., Hota S., Hussain M.S., Kumari S., Kumar M.

Deciphering the role of *Leptospira* trigger factor domains in proteostasis and their function as heat shock regulators in a heterologous host

(2026) International Journal of Biological Macromolecules, 369, art. no. 152783

DOI: 10.1016/j.ijbiomac.2026.152783

ABSTRACT: Trigger Factor (TF) is an essential ribosome-associated molecular chaperone that plays a critical role in protein folding, stabilization, and proteostasis maintenance across various bacterial systems. The multifunctional roles of TF, particularly its involvement in virulence modulation, stress response, and adhesion, are well established across multiple organisms, including *Leptospira interrogans*. However, its precise function

has yet to be fully explored. Transcriptomic studies of *Leptospira* have unequivocally demonstrated that the genes *tig* and *clpP1* are co-transcribed, indicating a significant regulatory interplay with the Clp protease complex. To further elucidate this relationship, this study engineered three LinTF mutant variants, targeting the N-terminal (LinTF Δ NTD) and C-terminal regions (LinTF Δ CTD and LinTF Δ pCTD). Functional assays confirmed that LinTF Δ pCTD and LinTF Δ CTD markedly enhanced LinClpP activity by 49% and 34%. No increase in LinClpP activity was observed with LinTF Δ NTD. Transmission electron microscopy and immunofluorescence techniques decisively revealed that LinTF is localized on the spirochete surface, a conclusion reinforced by subcellular fractionation. While LinTF is predominantly cytoplasmic, a small membrane-associated fraction indicates surface-associated moonlighting function. Full-length LinTF complemented the *E. coli* Δ *tig* Δ *dnaK* strain, fully restoring growth at 37 °C. Conversely, LinTF Δ pCTD complementation permitted only moderate recovery, while neither LinTF Δ CTD nor LinTF Δ NTD exhibited any rescuing effects on the *E. coli* Δ *tig* Δ *dnaK* strain. Moreover, LinTF significantly promoted the refolding of chemically denatured GAPDH, as evidenced by a fluorescence emission shift and dynamic light scattering. Overall, these findings decisively highlight the domain-specific contributions of LinTF to LinClp protease regulation and protein folding, reaffirming its critical role in maintaining proteostasis in *L. interrogans*.

LANGUAGE OF ORIGINAL DOCUMENT: English

McMillan I.A., Dahal P., Sarker M.S., La T.H.A., McMillan J.K.P., Chang S.P., Sarathchandra S.R., Gamage C., Norris M.H.

Spatiotemporal dynamics and environmental trends of reported human leptospirosis in Sri Lanka, 2007-2024

(2026) *Frontiers in public health*, 14, pp. 1814638

DOI: 10.3389/fpubh.2026.1814638

ABSTRACT: Leptospirosis is a globally significant zoonoses that contributes to 1.03 million infections and 58,900 deaths annually. Animal reservoirs carry pathogenic *Leptospira* in the kidneys and contaminate the environment via urine. Contact of mucous membranes or abrasions with pathogenic *Leptospira* commonly leads to infection in humans. Leptospirosis has various presentations, ranging from an acute self-limiting infection to a severe infection with multi-organ involvement requiring hospitalization. In 2008, leptospirosis cases in Sri Lanka spiked, marking a potential emergence event. In the current work, cases of reported leptospirosis were analyzed from 2007 to 2024 identifying an overall increase in leptospirosis over the study period and annual seasonality. Increased precipitation seems to be driving the seasonal spikes in leptospirosis case rates across Sri Lanka. District level case rates over the 18-year time frame increased in the southern districts and indicated a dissemination to northern districts. A low-low spatial cluster, signifying an area of lower disease, was identified in the northern districts from 2007 to 2012, but was not observed from 2013 to 2024. A high-high spatial cluster, indicating an area of increased incidence, was identified from 2013 to 2024. District level precipitation and case rates were correlated over the 18-year study period, suggesting that rainfall is a driver of disease in Sri Lanka. While this correlation was identified to be significant, the correlation weakens over time when analyzed per annum with 2011 and 2024 showing no link. No correlation was identified in 2011, however, analysis of precipitation trends and case rates over the year show that major flooding events drove anomalous increases in leptospirosis case rates throughout the country. In 2024, a record year in reported leptospirosis, there was also no correlation over the entire year but the seasonality of disease still aligns with the overall trend. Investigation of renal carriage in five potential animal reservoirs identified that all carried the *lipL32* gene of pathogenic *Leptospira* species. Together, this work identified temporal and spatial

trends of human leptospirosis in Sri Lanka, identifying a link with precipitation as a potential driver of disease, and further characterized localized renal carriage of animal reservoirs linked to environmental contamination.

LANGUAGE OF ORIGINAL DOCUMENT: English

NMM R., IK J., N A., KAD W., JF S.

Severe leptospirosis complicated by atypical hemolytic uremic syndrome, myocarditis, and acute liver injury: a therapeutic challenge: a case report and review of the literature

(2026) Journal of Medical Case Reports, 20 (1), art. no. 325

DOI: 10.1186/s13256-026-06093-w

ABSTRACT: Background: Severe leptospirosis, also known as Weil's disease, is a life-threatening zoonotic infection characterized by multi-organ dysfunction, including acute kidney injury and jaundice. We report this case due to its rarity and complex nature. Case presentation: This case report describes a 44-year-old previously healthy, Sri Lankan Sinhalese male who presented with high-grade fever, deep jaundice, acute kidney injury, and signs of systemic inflammation. Despite early initiation of intravenous antibiotics, steroids, and supportive care, the patient's condition deteriorated with features suggestive of atypical hemolytic uremic syndrome (aHUS), myocarditis, acute respiratory distress syndrome (ARDS), and acute liver injury. Diagnostic findings revealed severe direct hyperbilirubinemia, intravascular hemolysis, and progressive renal failure requiring sustained low-efficiency dialysis (SLED). Etiology evaluation revealed leptospira Ig M positivity. A multidisciplinary approach, including therapeutic plasma exchange (TPE), was employed, resulting in gradual clinical improvement, although the patient remained dialysis-dependent at discharge. Conclusions: This case underscores the importance of recognizing atypical complications of leptospirosis and highlights the role of therapeutic plasma exchange as a potential rescue therapy in severe and refractory cases. Further research is needed to optimize management strategies in such complex clinical scenarios.

LANGUAGE OF ORIGINAL DOCUMENT: English

Luangnara A., Towachiraporn S., Wiwatkunupakarn N., Thongwitokomarn H.

Impact of flooding events on waterborne and vector-borne infections: a systematic review

(2026) BMC Infectious Diseases, 26 (1), art. no. 1148

DOI: 10.1186/s12879-026-13442-z

ABSTRACT: Background: Flooding from natural disasters has become increasingly common worldwide, increasing the risk of infectious disease transmission, particularly waterborne and vector-borne infections. Although many studies report outbreaks following floods, the evidence remains fragmented across regions and pathogens. A comprehensive review is needed to clarify these associations and inform effective prevention and response strategies. Methods: A systematic search of PubMed, Embase, and the Cochrane Library was conducted between November 2024 and January 2025, identifying studies published from January 1, 2014, to December 31, 2024. Eligible studies assessed the association between flooding and waterborne or vector-borne infections and their health outcomes or evaluated related prevention and response interventions. Data were synthesized narratively due to study heterogeneity. Results: Of the 1,785 records identified, 71 studies met the inclusion criteria. Flooding was consistently associated with increased incidence of waterborne infections, including leptospirosis, cholera, bacillary dysentery, and hepatitis A/E, as well as vector-borne infections such as dengue and malaria. Outbreaks varied by region, flood characteristics, and the strength of existing public health infrastructure. The lag period between the onset of flooding and disease emergence

ranged from days to weeks. Timely interventions such as chemoprophylaxis, vaccination, water, sanitation, and hygiene (WASH) measures, and vector control may help mitigate outbreaks; however, most included studies were observational in design, and the overall certainty of evidence was low to moderate. Data on health system impacts, including hospitalization rates, intensive care unit burden, and mortality stratified by level of care, remain limited. Conclusion: Flooding was most frequently associated with increased incidence of cholera, bacillary dysentery, leptospirosis, dengue, and malaria, each with distinct lag periods critical for outbreak prediction. Reported lag periods ranged from days to weeks. Limited observational evidence suggests that doxycycline chemoprophylaxis for leptospirosis, oral cholera vaccination, and early vector control may be useful in selected post-flood settings. These findings support strengthened post-flood surveillance and context-specific preparedness measures, while highlighting the need for higher-quality comparative studies. Registration: PROSPERO CRD42025635687. Clinical trial number: Not applicable.

LANGUAGE OF ORIGINAL DOCUMENT: English

Soares Viana G.G., Heinemann M.B., Nastri A.C.S.S., Gomes H.R., Pinho J.R.R., Gomes-Gouvêa M.S.

Comparative evaluation and analytical performance of four lipL32-based qPCR assays for detection of pathogenic *Leptospira* spp

(2026) Diagnostic Microbiology and Infectious Disease, 116 (3), art. no. 117500

DOI: 10.1016/j.diagmicrobio.2026.117500

ABSTRACT: Background: *Leptospira* spp. cause leptospirosis, a globally distributed zoonosis with significant morbidity in tropical regions. Early diagnosis is challenging, particularly in the acute phase when serological markers may not yet be detectable. Molecular approaches such as real-time PCR (qPCR) enable direct pathogen detection; however, several lipL32-targeting assays have been described and rarely compared under equivalent conditions. Methods: Four previously published qPCR assays (A–D) targeting the lipL32 gene were comparatively evaluated using serial dilutions of *Leptospira interrogans* culture to assess assay performance across decreasing relative bacterial loads. The assay showing the most consistent performance was further analyzed using genome equivalent (GEq)-based quantification to determine amplification efficiency, linearity, limit of detection (LoD), and reproducibility. Its performance was also evaluated across different experimentally inoculated human clinical matrices, including whole blood, serum, plasma, urine, and cerebrospinal fluid. Results: Assay C demonstrated the most consistent performance, with an amplification efficiency of 95% and R^2 of 0.97. The LoD was established at 8.9×10^9 GEq/ μ L, with consistent detection across replicates at this concentration. Whole blood, serum, CSF, and urine showed consistent detection across dilutions, whereas plasma exhibited reduced detection consistency at the low target levels. Conclusions: Among the evaluated assays, Assay C demonstrated robust and reproducible performance across multiple experimentally inoculated human clinical matrices. These findings support its potential application for molecular detection of *Leptospira* spp., while highlighting the importance of assay selection and pre-analytical optimization to improve molecular detection performance.

LANGUAGE OF ORIGINAL DOCUMENT: English

Yosef D.K., Ahad A.A., Arog H.A., Ahmed A.I.

Zoonotic transmission risk in flood-prone river basins: community knowledge and behavioural determinants of leptospirosis in eastern Ethiopia

(2026) BMC Public Health, 26 (1), art. no. 1864

DOI: 10.1186/s12889-026-27618-4

ABSTRACT: Background: Leptospirosis is a neglected zoonotic disease with a rising incidence in flood-prone tropical regions. In the Shabelle River Basin of eastern Ethiopia, recurrent flooding combined with close human–animal contact creates conditions conducive to transmission. However, community knowledge, attitudes, and behaviors related to leptospirosis remain poorly characterized, limiting effective prevention efforts. Methods: A community-based cross-sectional study was conducted in flood-affected districts of Mustahil and Fer Fer in eastern Ethiopia. Adult household heads or primary caregivers were selected using multistage sampling with systematic random sampling within flood-affected kebeles. Data on knowledge, attitudes, and preventive practices regarding leptospirosis were collected through a structured interviewer-administered questionnaire. Descriptive statistics and logistic regression analyses were used to identify factors associated with high-risk behaviors. Results: Of the 422 respondents, only 15.2% had heard of leptospirosis, and 99.1% demonstrated poor knowledge of its transmission, symptoms, and prevention. Although 60.2% recognized flooding as a serious hazard, only 30.3% acknowledged the risk posed by rodents. High-risk behaviors were prevalent, including floodwater farming (73.0%), barefoot irrigation (64.9%), and sharing water sources with livestock (52.8%). Livestock ownership was strongly associated with high-risk practices (adjusted odds ratio [AOR] = 16.96), whereas the presence of rodents in households was inversely associated (AOR = 0.31). Higher risk perception modestly reduced engagement in risky behavior (AOR = 0.90). No significant associations were found with other sociodemographic factors. Conclusions: This study highlights critical gaps in community knowledge and widespread high-risk behaviors contributing to leptospirosis transmission in flood-prone areas of eastern Ethiopia. The inverse association between rodent presence and high-risk behaviors likely reflects behavioral adaptations rather than a biological protective effect. Integrated One Health interventions are urgently needed, focusing on culturally appropriate community education, enhanced rodent control through environmental management, improved water and sanitation infrastructure, and increased access to protective equipment. Strengthening health system capacity for leptospirosis diagnosis and surveillance will support timely detection and response. Embedding leptospirosis prevention within existing flood response and zoonotic disease frameworks can enhance resilience to climate-sensitive health risks in vulnerable pastoralist populations. Trial registration: Not applicable.

LANGUAGE OF ORIGINAL DOCUMENT: English

Sharma K., Agarwal G., Joshi S., Kumari P., Nisar K.S.

Analysis of human and rodent population in leptospirosis disease using numerical methods

(2026) Discover Applied Sciences, 8 (6), art. no. 695

DOI: 10.1007/s42452-026-08609-x

ABSTRACT: In this article, the author has studied Leptospirosis in human and rodent populations using a compartmental mathematical model with Caputo-Fabrizio fractional-order derivatives. The model includes disease-causing agents and the rate of human infection. Using the iterative method and fixed point theory, the existence and uniqueness of the model are studied. Further, disease-free and endemic equilibrium points are examined, showing that the disease-free equilibrium points become increasingly stable as the fractional order decreases. Finally, numerical simulations using the three-step Adams-Bashforth method are presented to illustrate the theoretical results. The novelty is that it integrates the Caputo Fabrizio fractional derivative using a generic leptospirosis structure, hence enable the model to indicate non-singular memory in the dynamics.

LANGUAGE OF ORIGINAL DOCUMENT: English

Quin T., Nisa S., Benschop J., Prinsen G., Yeung P., Wright J., Collins-Emerson J.M., Baker M.G.

Clinical complexities in diagnosing and managing leptospirosis in New Zealand: a qualitative analysis

(2026) *New Zealand Medical Journal*, 139 (1636), pp. 76 - 86

DOI: 10.26635/6965.7200

ABSTRACT: aim: Leptospirosis is a bacterial zoonosis often under-diagnosed due to its presentation as an undifferentiated febrile illness. This study aimed to explore the clinical complexities involved in diagnosing and managing leptospirosis cases in New Zealand. method: Qualitative content analysis of clinical notes from 42 leptospirosis cases used a dual deductive and inductive approach to identify key themes. results: Three key themes emerged, highlighting the critical role of clinician reasoning in early detection and appropriate clinical response: 1) multiple factors contribute to delayed diagnosis, including incomplete exposure histories and deviation of symptoms from textbook definitions, 2) there were challenges with diagnosis and the use of medication in post-acute care, and 3) interpretation and use of confirmatory tests was inconsistent and complex. Clinicians were confident in suspecting leptospirosis when clinical history taking also assessed relevant exposure. conclusion: Based on these findings, we have made recommendations to prevent delayed diagnosis. We advocate updating clinical references to better reflect New Zealand-specific disease presentation and risk factors to support early diagnosis. National standardisation of diagnostic test timing, selection and interpretation is recommended, alongside clearer notification pathways. Further research could focus on early diagnostic markers to improve clinical decision making in practice.

LANGUAGE OF ORIGINAL DOCUMENT: English

Sadeghian M.

One Health models for the prevention and management of bacterial zoonoses: a comprehensive systematic review

(2026) *Zoonoses (Ireland)*, 6 (1), art. no. 16

DOI: 10.15212/ZOONOSES-2025-0076

ABSTRACT: Bacterial zoonoses such as brucellosis, salmonellosis, leptospirosis, anthrax, campylobacteriosis, and listeriosis remain major global health threats with substantial economic and social effects. Despite decades of surveillance and control through traditional sector-based approaches, their burden persists, particularly in low-and middle-income countries. The One Health framework, which emphasizes the interconnectedness of human, animal, and environmental health, has emerged as a transformative strategy for managing these complex diseases. This systematic review, conducted in accordance with PRISMA guidelines, involved searching the PubMed, Scopus, and Web of Science (2000–2024) databases with combined terms for “One Health,” “bacterial zoonoses,” and specific pathogens. Of 2,847 records identified, 187 peer-reviewed studies, systematic reviews, and implementation reports met the inclusion criteria. Evidence was synthesized regarding the epidemiology of major bacterial zoonoses; existing governance structures; and integrated prevention strategies, including vaccination, food safety, environmental monitoring, and community engagement. Key challenges include fragmented governance, limited funding, antimicrobial resistance, and data gaps; however, opportunities may arise from digital technologies, surveillance using artificial intelligence, and global policy frameworks. Effective One Health implementation will require robust institutional coordination, adequate resources, and integrated surveillance systems. The findings suggest evidence-based recommendations for advancing sustainable global control of bacterial zoonoses.

LANGUAGE OF ORIGINAL DOCUMENT: English

Agustoni E., Mechaly A., Dalla Rizza J., Beriashvili D., Pluhackova K., Isaikina P., Trajtenberg F., Müntener T., Wunder E.A., Jr, Ko A.I., Schirmer T., Buschiazzo A., Hiller S.

Activation mechanism of the full-length histidine kinase LvrB from pathogenic *Leptospira*

(2026) Nature Communications, 17 (1), art. no. 5298

DOI: 10.1038/s41467-026-71783-4

ABSTRACT: Pathogenic *Leptospira* modulate their virulence via the Lvr signaling system, with the histidine kinase LvrB being a central element. LvrB is a prototype of Rec-controlled histidine kinases, which are frequently found in bacterial two-component systems, and yet whose regulatory mechanisms remain largely unknown. Here, we report full-length structures of LvrB in different states uncovering its mechanism of activation. Kinase-inactive LvrB is a symmetric homodimer, with its catalytic domains rigidly clasped onto the central helical domain. Phosphorylation of the N-terminal Rec domains induces coiled-coil formation of the central α S helices thereby breaking symmetry through liberation of the catalytic domains into a dynamic, auto-phosphorylation competent state. We further identified LvrB's downstream effector partner LvrC, an anti- σ factor that reprograms the transcription of hundreds of virulence genes. Our findings set a mechanistic paradigm for Rec-controlled histidine kinases enabling the design of virulence inhibitors.

LANGUAGE OF ORIGINAL DOCUMENT: English