



**Istituto Zooprofilattico Sperimentale
della Lombardia e dell'Emilia – Romagna “Bruno Ubertini”
Centro di Referenza Nazionale per la Leptospirosi**

BOLLETTINO BIBLIOGRAFICO

Edizione n. 2026/08

Agosto 2026

Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia – Romagna “Bruno Ubertini”

Reparto Tecnologie Biologiche Applicate – Laboratorio Batteriologia Specializzata

Email: mario.dincau@izsler.it, crn.leptospirosi@izsler.it

Telefoni: 030 2290268, 030 2290323

Le citazioni bibliografiche presentate in questo bollettino sono state ottenute mediante la banca dati Scopus utilizzando come parole chiave "Leptospira" e "leptospirosis" ricercate nei titoli, negli abstracts e nelle parole chiave delle pubblicazioni.

Randolph M.W., Nally J.E., Yoshimoto S.K., Chow B., Wagner D.M., Stone N.E., Sahl J.W., Hamond C., LeCount K., Stuber T., van der Linden H., Reagan K., Schrieber A., Sebastian J., Sykes J.E.

Clinical and molecular characterization of an outbreak of leptospirosis in dogs from Los Angeles County, California, USA, 2021

(2026) Journal of Clinical Microbiology, 64 (7), art. no. e00240-26

DOI: 10.1128/jcm.00240-26

ABSTRACT: In 2021, the Los Angeles County (LAC) Department of Public Health suspected a leptospirosis outbreak in LAC affecting over 200 client-owned dogs. We aimed to characterize the outbreak and describe microbiologic findings, risk factors, diagnostic test performance, and outcomes in dogs diagnosed with leptospirosis at two specialty practices. *Leptospira* culture isolates from four cases were subjected to serotyping and whole-genome sequencing (WGS); WGS was also performed on one enriched genome isolate. After the outbreak, data were gathered on 59 cases and compared to the background hospital population (controls, n = 15,536). All isolates were *Leptospira interrogans* serovar Canicola, but each was distinct based on WGS. Cases clustered in space and in time. Cases evaluated during the outbreak peak had increased odds of exposure to indoor congregate facilities (ICFs). None of the 47 dogs with known leptospirosis vaccination history were completely vaccinated. *Leptospira* real-time PCR on blood and urine was positive in 15/56 (27%) and 49/54 (91%) of dogs, respectively. Initial serologic testing using the microscopic agglutination test and point-of-care tests was positive in 22/29 (76%) and 27/35 (77%) of dogs, respectively. Fifty-four (92%) of 59 dogs survived to discharge; some remained azotemic. No associated human cases were identified. In conclusion, *L. interrogans* serovar Canicola was associated with a leptospirosis outbreak in unvaccinated dogs, which had public health implications given widespread dog ownership rates. Data analysis suggested multiple infection sources, including ICFs. Urine PCR was the most sensitive diagnostic test. Such outbreaks might be prevented through more widespread vaccination. **IMPORTANCE** Leptospirosis is a zoonotic bacterial disease transmitted through the urine of infected animals. We characterized an outbreak of leptospirosis in unvaccinated dogs in Los Angeles County and showed that cases were associated with housing in dog daycare and boarding facilities. Culture of several *Leptospira* isolates from the post-peak period identified *Leptospira interrogans* serovar Canicola, supporting the potential for dogs to act both as reservoirs and incident hosts for this serovar. Across the entire study period, multiple independent infection sources seemed likely based on molecular and spatial epidemiologic analysis, which might have included exposure to other dogs in indoor congregate facilities, rodents, or rodent urine. Our findings support the need for vaccination of dogs to reduce the risk to dog and human health, a high index of suspicion for the disease in unvaccinated dogs, the combined use of molecular and serologic tests to optimize diagnosis, and early treatment to optimize outcomes.

LANGUAGE OF ORIGINAL DOCUMENT: English

Sharma T.D., Subba S.H., Dophthapa Y.P., Tamang S., Tiwari S.

Sero surveillance of human brucellosis and leptospirosis among veterinary personnel in Sikkim, India: A descriptive cross-sectional study

(2026) Indian Journal of Medical Research, 164 (1), pp. 149 - 152

DOI: 10.25259/IJMR_2970_2025

<https://www.scopus.com/pages/publications/105045505128?origin=resultslist>

ABSTRACT: A cross-sectional sero-surveillance study was conducted across the five districts of Sikkim to determine the seroprevalence of Brucella and Leptospira antibodies among veterinary and para-veterinary personnel. Serum samples were tested for Brucella using the Rose Bengal Test, Standard Agglutination Test, and ELISA (IgG/IgM), while Leptospira antibodies were detected using ELISA (IgG/IgM). Brucella seroprevalence was 18.8%, and Leptospira seroprevalence was 20.5%. The findings indicate a considerable level of exposure to both infections in this occupational group, underscoring the need for strengthened surveillance and preventive measures within a One Health framework.

LANGUAGE OF ORIGINAL DOCUMENT: English

Gautam H., Kumar B.V.S., Singh S., Sidhu S.

A recombinant Loa22-based latex agglutination test and indirect ELISA for the sero-detection of leptospirosis in dogs and cattle

(2026) Archives of Microbiology, 208 (10), art. no. 497

DOI: 10.1007/s00203-026-05072-5

ABSTRACT: Leptospirosis is a widespread zoonotic disease of significant veterinary and public health importance, particularly in dogs and cattle. The present study aimed to develop and evaluate recombinant Loa22 (rLoa22)-based serological assays, including an indirect enzyme-linked immunosorbent assay (iELISA) and a latex agglutination test (LAT), for the detection of anti-leptospiral antibodies in canine and bovine sera. Serum samples were initially screened using the microscopic agglutination test (MAT) to classify true positive and true negative samples. The LAT was standardized using rLoa22-coated latex beads and evaluated for diagnostic accuracy, analytical specificity, prozone effect, and shelf-life stability. Receiver operating characteristic (ROC) analysis was employed to determine optimal iELISA cut-off values, and agreement between assays was assessed using Cohen's kappa coefficient. The iELISA demonstrated excellent diagnostic performance, with area under the curve (AUC) values of 0.988 in dogs and 1.00 in cattle, achieving 100% sensitivity and $\geq 96.81\%$ specificity, along with excellent agreement with MAT ($\kappa = 0.91$ in dogs; $\kappa = 0.97$ in cattle). The rLoa22-based LAT exhibited 100% sensitivity and specificities of 89.36% in dogs and 91.67% in cattle, showing substantial agreement with MAT ($\kappa = 0.79$ for both species). However, the observed high sensitivities may be influenced by the limited number of MAT-positive samples. No cross-reactivity was detected with Brucella or enterobacterial infections, although a prozone effect was observed at high antibody concentrations. The assays were further validated using serum samples from dogs ($n = 300$) and cattle ($n = 98$) suspected of leptospirosis. Overall, the rLoa22-based LAT and iELISA may serve as useful complementary tools for the screening of leptospirosis, particularly in endemic and resource-limited settings. However, validation in a larger set of MAT-positive samples is warranted.

LANGUAGE OF ORIGINAL DOCUMENT: English

Locsmándi G., Kádár-Hürkecz E., Kienle Z., Tárnoki-Boross K., Sima K., Erdősi T., Egyed L.

Genetic diversity of *Leptospira* strains circulating in humans and in free-ranging rats indicates that rats are not sources of human leptospirosis in Hungary 2022–2025

(2026) Pathogens, 15 (7), art. no. 729

DOI: 10.3390/pathogens15070729

ABSTRACT: One hundred and ninety free-ranging rat individuals from dozens of sampling areas (towns, farms, villages) were investigated for Leptospira infections. From the renal tissues (kidneys and urinary

bladders), DNA was extracted, and the samples were screened by an lfb1-specific PCR assay. The PCR products were sequenced. One hundred and three (54.2%) of the samples proved to be positive. All detected *Leptospira* belonged to the pathogenic phylogenetic cluster, and only one species was detected: all 103 positive samples belonged to *L. interrogans* lfb1 species group 1. In parallel, 353 human samples (urine, anticoagulated blood, tissues) from 232 patients over the period 2022–2025 submitted with suspected *Leptospira* infections were tested by commercial multiplex real-time PCR kits. Twenty-nine (8%) positive samples were found, which were retested by lfb1-specific PCR. The quality of 20 PCR products was sufficient for sequencing, representing 14 individual patients. Among the 14 positive patients we identified two *Leptospira* species: *L. kirschneri* lfb1 species group 6 in one case and *L. interrogans* in 13 cases (one lfb1 species group 3 imported case, 12 lfb1 species group 2). Comparison of the lfb1 sequences obtained from rats (lfb1: 1) and human cases (lfb1: 2, 1: 3, 1: 6) indicated that, although rat populations maintain the pathogen in high prevalence, they could not be the sources of the identified human *Leptospira* infections.

LANGUAGE OF ORIGINAL DOCUMENT: English

Viroj J., Morand S.

AUTHOR FULL NAMES: Viroj, Jaruan (57225210958); Morand, Serge (7006833126)

57225210958; 7006833126

The estimated burden of human leptospirosis in Thailand based on national surveillance data (2004-2020): a case study of Mahasarakham province

(2026) Studies in Health Technology and Informatics, 338, pp. 249 - 253

DOI: 10.3233/SHTI260840

ABSTRACT: Leptospirosis is still an important public health problem in Thailand. We analyzed the burden of disease between 2004-2020 in Mahasarakham, Thailand. General Additive Modeling (GAM) was used to explain the evolution of leptospirosis cases per sub-district. Leptospirosis cases increased from 2004 to 2012, plateaued during 2012-2017, and slightly declined from 2017 to 2020. Results of a general additive model showed that the number of leptospirosis cases by sub-district of Mahasarakham province and by year was likely explained by human population size, cattle size, rainfall, and urban area cover. Sub-districts situated in low elevations with dense cattle farming were at risk for leptospirosis during periods of heavy rainfall. These results raise the need to improve surveillance and public education campaigns for leptospirosis prevention. Collaboration among public health, livestock sector, environment sector, and local communities using the One Health approach is vital for effective leptospirosis prevention and control.

LANGUAGE OF ORIGINAL DOCUMENT: English

Lilenbaum W., Gutiérrez-Del-Río I., Mendes J., Correia Lucas F.L., Fernández J., Lombó F.

Antimicrobial and antibiofilm activity of selected flavonoids against pathogenic *Leptospira* species

(2026) Archives of Microbiology, 208 (10), art. no. 506

DOI: 10.1007/s00203-026-05067-2

ABSTRACT: Leptospirosis is a widespread zoonotic disease where biofilm formation significantly hinders treatment, contributing to chronic infections. This preliminary study evaluated the antimicrobial and antibiofilm properties of four flavonoids—apigenin, xanthohumol, quercetin, and luteolin—against *Leptospira santarosai* (sv. Guaricura), *L. interrogans* (sv. Copenhageni and Hardjoprajitno), and *L. borgpetersenii* (sv. Hardjobovis). Using microdilution methods, quercetin and apigenin exhibited superior antimicrobial activity, reaching MICs

of $\leq 0.12 \mu\text{g/mL}$ for *L. santarosai* sv. Guaricura. In antibiofilm assays, quercetin was the most effective compound, successfully disrupting biofilm at minimal biofilm disruptive concentrations (MBDC) as low as $< 0.0012 \mu\text{g}/\mu\text{L}$ for *L. santarosai* sv. Guaricura and for *L. interrogans* sv. Copenhageni and Hardjoprajitno. These findings highlight the potential therapeutic candidates, requiring further evaluation, for managing both acute and persistent forms of leptospirosis, either alone or as adjuvants to current antibiotic therapies. Further in vivo studies are warranted to confirm their therapeutic safety and clinical efficacy.

LANGUAGE OF ORIGINAL DOCUMENT: English

Puri G., Patel S.B., Singh V.K., Manat T.D., Vala J.A., Patel D.R.

Hemato-biochemical alterations in leptospirosis confirmed dogs in south Gujarat region

(2026) Veterinary Practitioner, 27 (1), pp. 16 - 18

ABSTRACT: Leptospirosis is a globally significant zoonotic re-emerging widespread disease. The present study was conducted to evaluate haematological and biochemical changes in *Leptospira* infected dogs in South Gujrat region and to detect leptospiral antibodies using immunoassay tests. A total of 60 dogs were divided into two groups. Group I consisted 50 positive dogs and Group II consisted 10 negative dogs based on clinical signs, urine dark-field microscopy (DFM), Immunocomb test and confirmed by Microscopic Agglutination Test (MAT). Urine samples from infected dogs showed characteristic motile *Leptospira* organisms under DFM and positive antibody reactions in the Immunocomb test. MAT results revealed reactivity against *L. grippityphosa*, *L. pomona*, and *L. pyrogenesserovars* indicating their prevalence in the South Gujarat region. Haematological analysis of infected dogs showed a significant elevation ($p<0.05$) in total leukocyte, lymphocyte, and granulocyte counts, with a reduction in total erythrocyte count, haemoglobin, and platelet counts, suggestive of inflammatory and haemorrhagic responses. Biochemical analysis demonstrated significantly elevated ($p<0.05$) levels of ALT, AST, ALP, BUN, creatinine, and glucose, along with a reduction in total protein and albumin levels, indicating hepatic and renal dysfunction. Thus, it can be concluded that urine DFM and immunocomb test serve as valuable tools for early screening of leptospirosis in dogs, while MAT provides confirmatory diagnosis in later stages. The observed alterations in haemato-biochemical parameters demonstrate substantial damage to hepatic, renal, and vascular systems, correlating with the severity of leptospiral pathology.

LANGUAGE OF ORIGINAL DOCUMENT: English

Sethi A., Prabhu A.R., Shashidhar V., Gupta N.

Persistent kidney dysfunction after leptospirosis-associated acute kidney injury: a case series from coastal Karnataka, India

(2026) International Urology and Nephrology

DOI: 10.1007/s11255-026-05290-2

ABSTRACT: Background: Leptospirosis has been infrequently associated with persistent kidney dysfunction fulfilling the criteria for chronic kidney disease (CKD). However, the entity remains poorly characterised. This study aimed to describe the clinical profile, laboratory findings, treatment requirements, and kidney outcomes of patients without recognised CKD risk factors who had persistent kidney dysfunction fulfilling CKD criteria at three-month follow-up after leptospirosis-associated Acute Kidney Injury (AKI). Methods: This descriptive case series was nested within a prospective cohort of hospitalised patients with leptospirosis admitted to a tertiary care hospital in coastal Karnataka, India, between April 2025 and March 2026. Patients with leptospirosis-

associated AKI who fulfilled Kidney Disease: Improving Global Outcomes (KDIGO) criteria for CKD at three-month follow-up were included. Leptospirosis was confirmed by immunoglobulin M (IgM) enzyme-linked immunosorbent assay or polymerase chain reaction (PCR). Patients with known CKD or recognised clinical risk factors for CKD, including diabetes mellitus, hypertension, family history of kidney disease, structural renal abnormalities, or other identifiable causes of kidney disease, were excluded. Clinical features, laboratory parameters, treatment details, organ support requirements, and kidney outcomes were recorded. Results: Among 101 hospitalised patients with leptospirosis, 67 (66.3%) developed AKI. Of these, 7 (10.4%) died in hospital, and 17 (28.3%) of the 60 survivors did not undergo serum creatinine testing at three-month follow-up. Among the remaining 43 evaluable survivors without known CKD or recognised CKD risk factors, 6 (14.0%) fulfilled criteria for CKD at three-month follow-up. All six patients had KDIGO Stage 3 AKI during admission. Admission serum creatinine ranged from 3.19 to 8.63 mg/dL, while peak serum creatinine ranged from 4.92 to 11.84 mg/dL. Jaundice was present in 4/6, 66.7%, of patients, leukocytosis was observed in all patients, and thrombocytopenia was present in all patients. Pulmonary complications were common, with pleural effusion in 4/6, 66.7%, patients, acute respiratory distress syndrome in 1/6, 16.7%, and diffuse alveolar haemorrhage in 1/6, 16.7%. Myocarditis was noted in 2/6, 33.3%, of patients. Three patients required haemodialysis, and three required mechanical ventilation. At discharge, serum creatinine remained elevated in all six patients, ranging from 1.85 to 5.15 mg/dL. At three-month follow-up, estimated glomerular filtration rate (eGFR) ranged from 44 to 59 mL/min/1.73 m²; five patients were classified as CKD Stage 3a and one as CKD Stage 3b. Conclusions: Severe leptospirosis-associated AKI may be followed by persistent kidney dysfunction at three months despite improvement in serum creatinine from peak values. Persistent creatinine elevation at discharge may be an important clinical warning sign. Patients with severe leptospiral AKI, particularly those with KDIGO Stage 3 AKI, dialysis requirement, persistent discharge creatinine elevation, or multiorgan involvement, may benefit from structured post-discharge kidney follow-up, including eGFR reassessment, urinalysis, proteinuria assessment, blood pressure monitoring, and, where feasible, tubular function testing.

LANGUAGE OF ORIGINAL DOCUMENT: English

Andityas M., Widantara H., Aziz F., Widayanti R., Sota P., Nuraini D.M.

A systematic review and meta-analysis to estimate the global prevalence of leptospirosis in sheep

(2026) Research in Veterinary Science, 210, art. no. 106342

DOI: 10.1016/j.rvsc.2026.106342

ABSTRACT: Leptospirosis in sheep is a zoonotic concern considering sheep may act as potential reservoirs for *Leptospira* spp. infection to humans. This study aimed to estimate the pooled prevalence of leptospirosis in sheep worldwide. A comprehensive literature search was conducted across databases following PRISMA guidelines. Meta-analyses were performed using a random effect model in R software (version 4.3.1) to calculate pooled prevalence with 95% confidence intervals (CI). Subgroup analyses were performed based on prevalence types, diagnostic methods and continental regions to explore sources of heterogeneity. A total of 138 studies comprising 54,174 samples and 10,299 positive detections were included in this study. The global pooled prevalence of leptospirosis in sheep was 15.69% (95% CI: 12.69–19.25) with overall heterogeneity (I²) 98%. The prediction interval ranged from 1.09% to 75.91%, indicating wide inter-study variability. The seroprevalence was 16.16% (95% CI: 12.91–20.04) and infection prevalence was 12.98% (95% CI: 8.07–20.22), showing no significant difference ($P = 0.40$). In addition, the prevalence of leptospirosis in sheep differed significantly across diagnostic methods and continents ($P < 0.01$), indicating substantial variation

influenced by both methodological and geographical factors. The funnel plot revealed marked asymmetry, suggesting potential publication bias which was confirmed by Egger's regression test ($P < 0.01$). In conclusion, leptospirosis is widely prevalent in sheep globally, with marked geographical and methodological heterogeneity. These findings highlight the epidemiological importance of sheep in leptospirosis transmission and underscore the need for improved surveillance, standardized diagnostic approaches, and targeted control strategies within a One Health framework.

LANGUAGE OF ORIGINAL DOCUMENT: English

Petakh P., Halabitska I., Lushchak O., Kamyshnyi O.

Regional and seasonal dynamics of leptospirosis in Ukraine, 2023–2025

(2026) Pathogens, 15 (7), art. no. 759

DOI: 10.3390/pathogens15070759

ABSTRACT: Background: Ukraine has substantial regional differences in climate, landscape, forest cover, and river networks, which may influence leptospirosis transmission. However, recent monthly oblast-level variation in leptospirosis incidence has not been systematically described. We used newly available surveillance data for 2023–2025 to assess seasonal and regional patterns of leptospirosis and their associations with weather, climatic zone, forest cover, and river network density. Methods: We analyzed surveillance data from 23 Ukrainian oblasts. Incidence was assessed by month, oblast, and climatic zone. Weather data were aggregated monthly; forest cover and river network density were included as predictors. Associations were assessed using correlation, cross-correlation, and Random Forest ML models. Results: Incidence showed a clear seasonal increase, reaching its highest levels in late summer and autumn, approximately one to three months after seasonal peaks in temperature and precipitation. The highest incidence was observed in Zakarpattia, Chernihiv, and Ternopil oblasts, while incidence by climatic zone was highest in the Carpathian group and lowest in the Steppe zone. Among weather variables, average temperature showed the clearest delayed association with leptospirosis incidence. River network density was the leading ecological predictor in the adjusted models. The positive unadjusted association between forest cover and incidence became negative after adjustment for river network density, suggesting that these variables captured overlapping ecological characteristics. In the Random Forest analysis, river network density was the top-ranked predictor, and the best-performing model achieved an AUC of 0.795. Conclusions: Leptospirosis incidence in Ukraine varied substantially by season and region. Delayed temperature effects, river network density, and forest cover were associated with regional risk. Monthly oblast-level surveillance with climatic and ecological data may help monitor leptospirosis risk, but war-related disruption to diagnosis and reporting should be considered.

LANGUAGE OF ORIGINAL DOCUMENT: English

Martin Mario B., Zhang Z., Jian H., Vernal S., Nilles E.J., Furuya-Kanamori L., Sartorius B., Lau C.L.

Estimating the burden of leptospirosis in the Caribbean: Insights from environmental and sociodemographic factors

(2026) PLoS neglected tropical diseases, 20 (7), pp. e0013876

DOI: 10.1371/journal.pntd.0013876

ABSTRACT: INTRODUCTION: Previous studies up to early 2000s found that leptospirosis incidence in humans was high across the Caribbean region (CR), yet up-to-date and reliable surveillance data are scarce. Limited research capacity in the region has further contributed to less robust characterisation of transmission

drivers, perpetuating a cycle of neglect. To address these gaps and support evidence-based public health responses, this study aims to update incidence estimates in the CR by integrating data from multiple data sources, including peer-reviewed publications, surveillance reports and environmental and sociodemographic datasets. **METHODOLOGY/PRINCIPAL FINDINGS:** We used mixed-effects hierarchical negative binomial models at the country/territory-year level, incorporating covariates (precipitation, temperature, gross domestic product, biodiversity loss, human footprint, population density, populations exposed to crop areas and frequency of extreme weather events) to estimate annual case numbers by country/territory. Temporal patterns in case fatality rate (CFR) were modelled using locally estimated scatterplot smoothing regressions. Between 2001 and 2023, we estimated 38,659 (95%CI 26,006-56,527) cases in the region. Annual incidence (cases/100,000 population) with small- to medium-sized population islands exhibiting the highest estimated incidence (Guadeloupe 23.0 (95%CI 17.2-30.3) and Saint Vincent and the Grenadines 21.3 (95%CI 11.3-36.0)). Estimated CFR increased over the study period, from 8.8% (95%CI 4.1-13.4) in 2001 to 12.2% (2.2-22.2 in 2022). **CONCLUSIONS/SIGNIFICANCE:** Leptospirosis remains an important public health concern in the CR, where small island developing states bear a disproportionate burden of the disease. These findings underscore the urgent need for strengthening surveillance systems and laboratory capacity in the region, particularly in small states, to provide accurate data to prioritise public health and environmental health interventions to reduce transmission and improve diagnosis and treatment.

LANGUAGE OF ORIGINAL DOCUMENT: English

Guedes I.B., Brandão G.R.E., Souza G.O., Heinemann M.B.

Dichloran as an antifungal agent in the routine maintenance of leptospiral cultures

(2026) Diagnostic Microbiology and Infectious Disease, 116 (3), art. no. 117574

DOI: 10.1016/j.diagmicrobio.2026.117574

ABSTRACT: Periodic cultivation of leptospires in culture media remains the standard method for preserving these bacteria, as alternative procedures may compromise their viability. However, prolonged incubation periods and continuous handling of cultures favor contamination by filamentous fungi, which can ultimately kill the leptospires. Therefore, this study evaluated the use of Dichloran as a fungal suppressor in the maintenance of *Leptospira* spp. isolates. The results demonstrated that Dichloran is a promising compound due to its low cost, ease of preparation, and lack of inhibitory effects on the bacteria when used at a specific concentration.

LANGUAGE OF ORIGINAL DOCUMENT: English

Yoshimura M., Ozuru R., Miyahara S., Obata F., Saito M., Sonoda T., Kurihara Y., Papin J.A., Kolling G.L., Yoshida S.-I., Hiromatsu K.

Environmental former Massilia group bacteria secrete metabolites that promote *Leptospira* growth

(2026) mSystems, 11 (7), pp. 1 - 15

DOI: 10.1128/msystems.00638-26

ABSTRACT: Understanding pathogen metabolism is critical for identifying key functions for drug targeting, establishing effective in vitro experimental systems, particularly for metabolically unique organisms such as *Leptospira*. Pathogenic *Leptospira* are thought to infect humans from environmental sources; however, direct isolation from environmental samples remains technically challenging and is not yet well established. Here, we report that a ubiquitous environmental bacterium belonging to the former Massilia group produces metabolites to promote the growth of *Leptospira interrogans*, which has been encountered through an

incidental contamination event and analyzed in this study. Gas chromatography–tandem mass spectrometry (GC-MS/MS) analysis demonstrated that cultivation of *Massilia* sp. strain NBRC 108631 in R2A medium resulted in the accumulation of metabolites, including branched-chain amino acid (BCAA) intermediates, compared to fresh medium. By combining genome-scale metabolic modeling with experimental validation using cell-free culture supernatant supplementation assays, we demonstrate that BCAA intermediates, particularly 2-ketoisocaproic acid (4-methyl-2-oxopentanoate; 4MOP), a leucine biosynthetic intermediate produced by strain NBRC 108631, enhance *Leptospira* growth. To investigate the metabolic role of 4MOP, we incorporated transcriptomic data into a genome-scale metabolic network model to generate condition-specific models. Resulted flux distributions indicated that *Leptospira* catabolized imported 4MOP to produce acetyl-CoA. Our results reveal a previously unrecognized metabolic interaction where metabolites produced by environmental bacteria support the growth of pathogenic *Leptospira*, offering mechanistic insight into its metabolic requirement. These findings have implications to understand the environmental persistence of *Leptospira* through its metabolic dependencies on coexisting microbes, and they also help develop better strategies for this pathogen. **IMPORTANCE** Pathogenic *Leptospira* persist in environmental reservoirs, yet the mechanisms supporting their growth remain poorly defined. Here, we find that metabolites produced by common environmental bacteria belonging to the former *Massilia* group can promote *Leptospira* growth, suggesting a previously unrecognized metabolic dependency on coexisting microbes. Importantly, this study indicates that combining genome-scale metabolic modeling with experimental validation provides a useful framework for identifying metabolic interactions that are otherwise difficult to resolve using conventional culture-based approaches. Current strategies may facilitate the systematic identification of growth-supporting metabolites and provide a basis for improving selective cultivation for uncultured or difficult-to-culture organisms. The determination of growth-promoting metabolites advances our understanding of pathogen persistence in natural environments and offers a generalized framework to study metabolically dependent microorganisms.

LANGUAGE OF ORIGINAL DOCUMENT: English

Fallah H., Salehi S., Ahmadi N.

60762871300; 60763181700; 60762712700

A rare presentation of leptospirosis with marked hyperbilirubinemia: diagnostic and therapeutic challenges

(2026) Journal of Mazandaran University of Medical Sciences, 36 (258), pp. 138 - 144

ABSTRACT: Leptospirosis is a widespread zoonotic infection caused by spirochetes of the genus *Leptospira*, primarily transmitted through contact with water contaminated by the urine of infected animals. The disease ranges in severity from a mild, self-limiting febrile illness to a severe form, known as Weil's disease, which is characterized by hepatic dysfunction, acute kidney injury, and coagulation abnormalities. Jaundice is a common clinical finding; however, severe hyperbilirubinemia is uncommon and may lead to diagnostic confusion with primary hepatobiliary disorders. Hepatic involvement typically follows a cholestatic pattern, with a disproportionate elevation of serum bilirubin relative to transaminase levels. We report the case of a 52-year-old man who presented with high fever, progressive jaundice, and oliguria after exposure to floodwaters. Physical examination revealed hypotension, tachycardia, conjunctival hyperemia, and tender hepatomegaly. Initial laboratory investigations demonstrated severe hyperbilirubinemia, with a total bilirubin level of 42.3 mg/dL, disproportionately elevated relative to serum transaminase levels (aspartate aminotransferase, 83 IU/L; alanine aminotransferase, 98 IU/L). The patient also had acute kidney injury (serum creatinine, 3.8 mg/dL),

thrombocytopenia, and evidence suggestive of hemolysis. Serological tests for viral hepatitis, malaria, and dengue were negative. The diagnosis of severe leptospirosis was confirmed by positive *Leptospira* IgM serology and the microscopic agglutination test (MAT), with a titre of >1:800. Following treatment with targeted antibiotic therapy, intravenous fluids, vasopressors, platelet transfusions, and supportive care, the patient showed marked clinical and laboratory improvement over the subsequent two weeks. This case highlights that severe hyperbilirubinemia with only mild transaminase elevation can be a rare but clinically important presentation of Weil's disease. Leptospirosis should therefore be included in the differential diagnosis of patients presenting with fever, jaundice, acute kidney injury, and a history of exposure to floodwaters or contaminated water. Early recognition, prompt initiation of appropriate antibiotic therapy, and supportive management are essential to prevent multiorgan failure and improve clinical outcomes.

LANGUAGE OF ORIGINAL DOCUMENT: Persian

San Martin M.F., Quiroga N., Casanovas-Massana A., Botto-Mahan C., Bacigalupo A., Cattan P.E., Arroyo P., Contardo J., Salgado R., Yefi-Quinteros E., Correa J.P.

Environmental detection of pathogenic *Leptospira* DNA in agricultural ecosystems from a mediterranean-climate region of central Chile

(2026) Pathogens, 15 (7), art. no. 661

DOI: 10.3390/pathogens15070661

ABSTRACT: Although pathogenic *Leptospira* DNA has been detected in water and soil from different climatic regions, information from Mediterranean-climate agricultural systems remains limited. This study characterized the environmental detection of pathogenic *Leptospira* DNA in water and soil samples from irrigated agroecosystems of central Chile, evaluating spatial and seasonal variation and associations with selected physicochemical variables. A total of 605 samples were collected from eight agricultural sites during spring 2019, summer 2020, and winter 2021. Samples were analyzed by real-time PCR targeting lipL32. Overall, 29.1% of samples were PCR-positive, and pathogenic *Leptospira* DNA was detected in all sites and seasons. Soil samples showed higher positivity than water samples (34.5% vs. 21.4%), and positivity was higher in summer (41.7%) than in spring (22.7%) or winter (19.3%). Water temperature and turbidity were the only physicochemical variables that differed between positive and negative samples, whereas the binomial generalized linear mixed model (GLMM) showed that season and sample type were associated with PCR positivity after accounting for site-level clustering. These results show that pathogenic *Leptospira* DNA can be widely detected in irrigated agricultural systems from a Mediterranean-climate region, suggesting that soil, seasonality, irrigation practices, and other site-level characteristics should be considered in future studies on the environmental ecology of pathogenic *Leptospira*.

LANGUAGE OF ORIGINAL DOCUMENT: English

Agustina Z.A., Hidajah A.C., Mas'ud N.A.

Mapping regional vulnerability to leptospirosis in Bondowoso regency using k-means cluster analysis

(2026) Jurnal Biometrika dan Kependudukan, 15 (1), pp. 1 - 10

DOI: 10.20473/jbk.v15i1.2026.1-10

ABSTRACT: Leptospirosis cases increased in Bondowoso Regency from 2022 to 2024. However, health interventions for leptospirosis in Bondowoso have not adopted a specific approach based on regional vulnerability levels. Clustering leptospirosis cases is crucial for focusing prevention and control programs. This

study aims to analyze the clustering of areas vulnerable to leptospirosis based on risk factors in Bondowoso Regency. This study employed a quantitative design using the K-Means method for clustering. The research variables included the number of disasters, the proportion of male residents, the proportion of farmers, elevation, the number of markets, the number of temporary waste disposal sites (TPS), and the proportion of vegetated land. Cluster analysis was conducted using SPSS. The results revealed three vulnerability clusters: high risk (3 districts), moderate risk (17 districts), and low risk (3 districts). The variables that distinguished the clusters were the number of TPS ($F=22.266$, $p=0.000$), the number of disasters ($F=6.047$, $p=0.009$), the number of markets ($F=5.367$, $p=0.014$), elevation ($F=5.388$, $p=0.013$), the proportion of farmers ($F=5.007$, $p=0.017$), the proportion of male residents ($F=.318$, $p=0.028$), and the proportion of vegetated land ($F=3.900$, $p=0.037$). In conclusion, vulnerability to leptospirosis in Bondowoso is influenced by a combination of environmental, infrastructural, and demographic factors, with sanitation being the most dominant. Centralized waste management, disaster mitigation, and strengthened area-based surveillance are necessary to achieve more effective prevention and control of leptospirosis.

LANGUAGE OF ORIGINAL DOCUMENT: English

Nehete A.H., Vaidya V.M., Zende R.J., Gandge R.S., Khillare R.S.

Detection of *Leptospira* spp. in animals and environmental contaminant by dark field microscopy, real-time PCR, microscopic agglutination test and enzyme linked immunosorbent assay

(2026) Indian Journal of Animal Sciences, 96 (2), pp. 170 - 172

DOI: 10.56093/ijans.v96i2.168301

ABSTRACT: The present study demonstrated endemic circulation of pathogenic *Leptospira* spp. among animals and environmental water sources in the Mumbai region. RTPCR assay targeting the lipL32 gene proved significantly more sensitive than DFM for detection of active infection ($P<0.001$), while MAT and ELISA revealed higher seropositivity reflecting previous exposure and circulation of leptospires in the region. Dogs showed the highest seropositivity, with Pyrogenes and Shermani emerging as predominant serovars, whereas Pomona and Tarassovi predominated in bovines. The detection of pathogenic leptospires in environmental water samples highlighted the important role of environmental reservoirs in disease transmission. The combined use of molecular and serological assays provided a comprehensive understanding of leptospirosis epidemiology and supports continuous surveillance, inclusion of locally prevalent serovars in vaccine formulations and implementation of integrated One Health strategies for effective disease control.

LANGUAGE OF ORIGINAL DOCUMENT: English

Jusail C.P., Vyas P., Noor H., Kavela S., Kodugade M.A., Kammili N., Faisal S.M.

Multi-omics analysis of human patient samples identifies key immune factors in *Leptospira* infection

(2026) Microbiology Spectrum, 14 (7)

DOI: 10.1128/spectrum.00047-26

ABSTRACT: Leptospirosis is a globally neglected zoonotic disease caused by pathogenic *Leptospira* species and characterized by diverse clinical manifestations. However, the molecular immune responses occurring in circulating human immune cells during acute infection remain incompletely understood. Although several leptospiral virulence determinants have been investigated, a detailed characterization of host immune signaling during human infection is still limited. To characterize host molecular responses during acute leptospirosis, we performed integrated transcriptomic and proteomic profiling of peripheral blood mononuclear

cells (PBMCs) from laboratory-confirmed leptospirosis patients and healthy controls. PBMCs were selected because they contain circulating immune cells involved in pathogen recognition and cytokine signaling, enabling focused analysis of host immune responses. Multi-omics network analysis was used to identify conserved immune pathways, and key host factors were further examined using ex vivo human whole-blood infection models and in vitro infection of human macrophages and monocytes. Transcriptomic profiling identified over 5,800 differentially expressed genes, predominantly upregulated, and associated with inflammatory signaling, including tumor necrosis factor signaling, interferon responses, and cytokine-mediated immune activation. Proteomic analyses detected 362 differentially expressed proteins in clinical PBMC samples and 818 differentially expressed proteins in the experimental infection model, with overlapping proteins defining a conserved host response. Comparative analysis identified 16 consistently upregulated host factors enriched in pathways related to neutrophil activation, hemostasis, and cytokine signaling. Quantitative RT-PCR confirmed increased expression of SERPINA1, BASP1, ORM1, NAMPT, and GCA, supporting their roles in inflammatory signaling and acute-phase immune responses. Together, these findings reveal conserved immune pathways activated during acute *Leptospira* infection and provide molecular insights into host-pathogen interactions in human leptospirosis. **IMPORTANCE** Leptospirosis is a globally important zoonotic disease caused by bacteria of the genus *Leptospira*. It can lead to severe systemic complications such as kidney failure, lung injury, and multi-organ dysfunction in affected individuals. Accumulating evidence indicates that these severe clinical manifestations are closely associated with dysregulated host immune and inflammatory responses triggered during *Leptospira* infection. However, the molecular mechanisms underlying these immune responses, particularly the transcriptional and proteomic alterations occurring in human immune cells during infection, remain incompletely understood. In this study, we analyzed immune cells from patients with leptospirosis and identified key host molecules and immune pathways activated during infection. Experiments using human blood and immune cell models confirmed the involvement of several inflammatory host factors. These findings improve our understanding of how the human immune system responds to *Leptospira* infection and identify host-response molecules that may help guide future biomarker discovery and therapeutic strategies.

LANGUAGE OF ORIGINAL DOCUMENT: English

Hawley G.D., Agrawal A., Alhashmi M., Novakovic M., Boggild A.K.

Probable leptospirosis in the adventure traveler with freshwater exposure: narrative review and case series (2026) *Pathogens*, 15 (7), art. no. 677

DOI: 10.3390/pathogens15070677

ABSTRACT: Leptospirosis is an emerging zoonotic infectious disease in the adventure traveler with recreational freshwater exposure. We describe three cases of probable leptospirosis acquired during whitewater rafting trips in rural Ecuador. Rafting took place following periods of heavy rainfall and flooding of rivers, which are well documented risk factors for leptospirosis. Two of our patients presented to our rapid assessment clinic with acute febrile illness after travel to a region with a confirmed leptospirosis outbreak, while the third patient presented four weeks after a convalescent episode of acute febrile jaundice during a dramatic rise in reported leptospirosis cases in Ecuador. Delayed turnaround times for confirmatory microbiologic diagnostics in leptospirosis challenge its management and necessitate provisional clinical diagnosis and empiric antimicrobials based on compatible clinical symptoms, biochemical abnormalities, exposure history, and known outbreak epidemiology. We herein situate the presentations of our patients within the broader

literature by reviewing the clinical, diagnostic, therapeutic, and prognostic considerations when caring for leptospirosis patients. Leptospirosis should be considered in the differential diagnosis of all patients presenting with acute febrile illness following adventure travel with freshwater exposure, and empiric treatment should be considered given the absence of readily available confirmatory microbiologic testing.

LANGUAGE OF ORIGINAL DOCUMENT: English

Kiuno K., Koizumi N., Kakita T., Takabe K., Mitsunaga S., Nishizato M., Nochide K., Tamaru S., Sakurai M., Takano A., Maeda K., Shimoda H., Hayasaka D.

Improved molecular serogroup typing reveals locally circulating *Leptospira* serogroups in wildlife in Yamaguchi, Japan

(2026) Comparative Immunology, Microbiology and Infectious Diseases, 129, art. no. 102510

DOI: 10.1016/j.cimid.2026.102510

ABSTRACT: Leptospirosis is a globally distributed zoonotic disease caused by pathogenic *Leptospira* spp., which are classified into numerous serogroups. Accurate serogroup identification is essential for epidemiological understanding and public health interventions in endemic regions. The microscopic agglutination test (MAT) is the conventional serological method for serogroup identification; however, it is labor-intensive and depends on extensive reference strain panels. Molecular serogroup typing (MST) has been proposed as an alternative approach, but its performance for region-specific strains has not been sufficiently evaluated. In this study, we improved an MST method optimized for Japanese *Leptospira* isolates and applied it to determine the serogroups of pathogenic *Leptospira* spp. detected in kidneys of wild boars (*Sus scrofa*) and sika deer (*Cervus nippon*) collected in Yamaguchi Prefecture, Japan, between 2016 and 2025. Pathogenic *Leptospira* DNA was detected in 23 of the 190 wild boars (12.1%) and 22 of the 275 sika deer (8.0%) by real-time PCR targeting *lipL32*. The improved MST identified serogroups Autumnalis, Australis, Canicola, and Hebdomadis in both host species, with Autumnalis predominating. In contrast, MAT using standard reference strains detected antibodies mainly against Hebdomadis and Australis, indicating discrepancies in the predominant serogroups between molecular and serological results. Notably, MAT using a local Autumnalis strain successfully detected Autumnalis antibodies in both hosts. These findings demonstrate that the improved MST complements serological testing.

LANGUAGE OF ORIGINAL DOCUMENT: English

Lee N., Corcuera Hotz I., Smith C., Bailey R., Ariyoshi K., Edwards T.

Efficacy and safety outcomes reported in human leptospirosis studies to inform the development of a core outcome and core outcome measurement set: a systematic review

(2026) PLoS neglected tropical diseases, 20 (7), pp. e0013651

DOI: 10.1371/journal.pntd.0013651

ABSTRACT: **BACKGROUND:** Leptospirosis is a neglected bacterial zoonotic disease of global health importance, disproportionately affecting marginalised communities in tropical and subtropical settings. Current clinical trial evidence for leptospirosis treatments remains limited by heterogeneous outcome reporting and trial design. This systematic review represents the first comprehensive synthesis of outcomes, outcome measures, and treatments reported across human leptospirosis research to inform the development of a core outcome and outcome measurement set. **METHODS:** This systematic review was registered (COMET and PROSPERO: CRD42023397461) and conducted in accordance with a pre-published protocol. Global

databases were searched for studies published on human leptospirosis without language or geographical restriction. Screening and full-text review were performed independently by two reviewers. Study characteristics, population, interventions, and reported outcomes, definitions and measurement tools were extracted. Quality and risk of bias assessments were performed. Outcomes were analysed descriptively and grouped thematically into domains. RESULTS: This review included 298 studies from 63 countries. There were 172 unique outcome types extracted and categorized into 23 domains. The clinical/physiological core area was the most frequently reported, with the renal and urinary domain comprising a quarter of all studies. Individual outcomes that predominated included mortality (165/298 studies), discharge from clinical services (79/298), and days of hospitalisation (77/298). Patient focused and harms outcomes were under-reported across studies. Quality assessments highlighted considerable study bias which did not improve with increasing study rigour. There were 92 outcome measures extracted and categorized into 13 thematic areas and of note was the inconsistency in types of measures, absence of patient-reported outcomes, and need for standardised and validated outcome definitions. Data captured on treatments highlighted the variability in clinical management practices worldwide. DISCUSSION/CONCLUSION: This review highlights the heterogeneity in outcome reporting, outcome measures, and treatments across human leptospirosis research. Establishing a consensus on core outcomes and core outcome measurements that are clinically relevant, patient-centred, and robust is needed to better support evidence-based guidelines.

LANGUAGE OF ORIGINAL DOCUMENT: English

Yeshinika K.A., Vidanapathirana S., Rambukwella R., Uluwattage W., Mudalige A.D., Wanigasuriya R., Jeewandara C., Priyankara D., Perera N.

Multicentre open-label randomised controlled trial to evaluate the efficacy and safety of moderate-dose and high-dose intravenous methylprednisolone combined with plasmapheresis versus plasmapheresis alone in leptospirosis pulmonary haemorrhage syndrome: a protocol

(2026) BMJ open, 16 (8), pp. e119234

DOI: 10.1136/bmjopen-2026-119234

ABSTRACT: INTRODUCTION: Leptospirosis is a zoonotic infection caused by the bacterium *Leptospira*, which typically enters humans through contact with water or soil contaminated with infected urine. One of the most important causes of death due to leptospirosis is leptospirosis pulmonary haemorrhage syndrome (LPHS). LPHS occurs due to an inappropriate immune response, resulting in excessive release of cytokines/chemokines or direct damage to alveoli by bacteria. Mortality remains high in LPHS, and management strategies of this deadly complication are under-investigated. Survivors have minimal residual lung injury, necessitating evidence-based treatment to improve mortality in LPHS. Steroids and plasmapheresis have been tried in many case series but lack robust evidence. Plasmapheresis has become a standard practice in Sri Lanka for managing LPHS, guided by expert opinion. This study will try to determine the effect of moderate-dose or high-dose steroid combination with plasmapheresis compared with plasmapheresis alone as a treatment for LPHS. METHODS AND ANALYSIS: This open-label, randomised controlled trial will enrol LPHS patients from four selected tertiary care hospitals in Sri Lanka. Participants will be randomly assigned to three groups in a 1:1:1 ratio to receive plasmapheresis alone, plasmapheresis with 150 mg/day methylprednisolone for 3 days or plasmapheresis with 1000 mg/day methylprednisolone for 3 days. Recruitment will consist of 28 participants to each arm of the trial. Diagnosis will be confirmed by *Leptospira*-specific PCR and microscopic agglutination test. Analysis will follow intention-to-treat principles

with adjustment for multiple comparisons. Primary outcome is all-cause mortality at 28 days. Secondary outcomes include hospital-acquired infections, duration of respiratory support, duration of intensive care unit stay, duration of hospital stay and side effects of steroid therapy. ETHICS AND DISSEMINATION: The ethical approval was obtained from the Research Ethics Committee of the University of Sri Jayewardenepura (ERC 20/24) and the trial has been registered in the Sri Lanka Clinical Trials Registry (SLCTR/2024/037). Trial is approved by the National Medicines Regulatory Authority in Sri Lanka (NMRA/CTRD/PA4/54). Study findings will be disseminated through peer-reviewed publications and conference presentations. TRIAL REGISTRATION NUMBER: Sri Lanka Clinical Trials Registry, Number SLCTR/2024/037. LANGUAGE OF ORIGINAL DOCUMENT: English

Sonam A., Hameed A., Stothard P., Grant J.R., Tellis R.C., Arun A.B.

Multidrug-resistant and virulence traits in genetically distinct vesicular *Leptospira* inhabiting farmland and sewage in Southern India

(2026) Scientific Reports, 16 (1), art. no. 24008

DOI: 10.1038/s41598-026-36690-0

ABSTRACT: The occurrence, taxonomic identity, drug resistance pattern and virulence traits of cultivable environmental *Leptospira* inhabiting the Indian subcontinent remain largely unexplored. Here, we describe the isolation and characterization of six novel strains of *Leptospira* from environmental samples and decode their drug resistance and virulence traits using in silico and in vitro approaches. Among six new isolates of *Leptospira*, two strains were identified to represent *L. interrogans* (SA-L3 and SA-L4), originating from sewage that flows proximal to a wildlife enclosure in Mangalore. We also found a strain each of *L. levettii* (SA-E5), *L. kmetyi* (SA-E7), *L. koniambonensis* (SA-E9) and *Leptospira* sp. (SA-E8, a putative *L. andrefontaineae*-like new species of *Leptospira*) within a ~ 5000 sq. ft. farmland area at Halageri, Uttara Kannada District, India. All isolates exhibited hemolysis and harbored genes encoding diverse sphingomyelinases. All strains were resistant to vancomycin, rifamycin, aztreonam, lincomycin, nalidixic acid, minocycline and troleandomycin and carried genes for a multitude of proteins conferring drug-resistant mechanisms. *Leptospira* sp. SA-E8 exhibited superior virulence traits and significant biofilm formation in vitro. Comparative genomics revealed remarkable interspecies variations in genome size (4.0–4.8 Mbp), GC content (35.1–44.8), coding sequences (3823–5296) and RNA (39–43). All strains exhibited the oxidation of diverse organic acids and were equipped with genetic machinery for ketone body oxidation. Our study demonstrated the occurrence of genetically distant *Leptospira* in environmental samples collected from India and provided evidence for conserved multidrug resistance and virulence, offering new dimensions to the theranostics of Leptospirosis. We suggest the inclusion of *L. levettii* SA-E5, *L. kmetyi* SA-E7, *L. koniambonensis* SA-E9 and *Leptospira* sp. SA-E8 in the array of leptospiral antigens being used in sero-epidemiological studies to establish their seroprevalence in humans, rodents and livestock.

LANGUAGE OF ORIGINAL DOCUMENT: English

Aguilar-Gamboa F.R., Saavedra-Camacho J.L., Mera-Villasis K.M., Coaguila-Cusicanqui L.Á.

Severe leptospirosis and multiple parasitic infections in a pediatric patient from the Peruvian amazon

(2026) Revista de la Facultad de Medicina Humana, 26 (2), pp. 179 - 186

DOI: 10.25176/RFMH.v26i2.7692

ABSTRACT: A school-aged female patient from a native Amazonian community presented with a 14-day history of acute febrile illness accompanied by myalgia, headache, gastrointestinal symptoms, jaundice, bloody diarrhea, and progressive deterioration with somnolence, cough, respiratory distress, and arthralgia. Physical examination revealed arthritis involving the left hip and knee, with erythema and swelling, without indication for surgical intervention. During hospitalization, she developed severe respiratory distress with respiratory acidosis, requiring intubation, vasopressors, and management in the intensive care unit. Laboratory and imaging studies showed leukocytosis, thrombocytopenia, elevated procalcitonin levels, a bilateral interstitial pattern, mild pleural effusion, a blood culture positive for *Staphylococcus warneri*, positive leptospirosis IgM, and expulsion of *Ascaris lumbricoides*. She received broad-spectrum antimicrobial therapy, hemodynamic and nutritional support, and multidisciplinary care. After extubation, she showed progressive improvement, although joint inflammation persisted, and she remained critically ill but stable under intensive monitoring.

LANGUAGE OF ORIGINAL DOCUMENT: English

Marcel D., Atil A., Ali M.R.M., Ahmed K., Othman R., Jeffree M.S.

Seroprevalence and factors associated with leptospirosis among market traders in Kudat town, Sabah: A cross-sectional study

(2026) Tropical Biomedicine, 43 (2), pp. 238 - 246

DOI: 10.47665/tb.43.2.015

ABSTRACT: Leptospirosis remains a major public health concern in tropical regions, including Malaysia, where it is endemic. To date, evidence from remote and understudied areas remains limited. This study aims to assess the epidemiological evidence of leptospirosis among market traders in Sabah, addressing the limited available data for this potentially high-risk occupational group in this region. A cross-sectional study was conducted among 295 market traders in Kudat Town, Sabah. Sociodemographic, occupational, environmental and behavioural data were collected using a modified validated questionnaire. Venous blood samples were collected to test for *Leptospira* antibodies using the Microscopic Agglutination Test; a titre of 1:50 or higher was considered seropositive. Seroprevalence was estimated descriptively, while factors associated with leptospiral seropositivity were examined using univariable and multivariable logistic regression analyses. The seroprevalence of leptospirosis among market traders was 5.4% (95% CI: 3.1–8.7). Antibodies were detected against 11 *Leptospira* serovars/strains, mainly Lep175. In univariable analysis, predictors for seropositivity included trading frequency, rodent presence, and proximity to garbage piles. With only 16 cases, the initial multivariable model had a low EPV of 4, suggesting possible overfitting. After reducing the model (EPV = 8), proximity to garbage piles remained strongly associated (AOR = 52.61; 95% CI: 13.50–205.13; $p < 0.001$), while rodents at home also became significant (AOR = 5.70; 95% CI: 1.12–29.08; $p = 0.037$). This study provides the first empirical evidence of leptospirosis exposure among market traders in Sabah. Although the overall seroprevalence was low, the findings indicate a measurable risk and underscore the need for further large-scale studies and integrated One Health interventions to reduce exposure in this vulnerable population.

LANGUAGE OF ORIGINAL DOCUMENT: English

Davila-Philipps S.V., Vasquez Hassinger T., Vela-Tello K.K., Carrasco-Celi J.I., Rios-Alava Y.N., Vasquez-Lechuga J.L., Parimango-Alvarez M.H., Marin-Lizarraga J., Ramirez-García E.A., Zevallos K.

Clinical and epidemiological characteristics of leptospirosis in patients under and over 5 years of age in primary health centers in the Peruvian Amazon, 2022–2024

(2026) PLOS Neglected Tropical Diseases, 20 (6), art. no. e0013473

DOI: 10.1371/journal.pntd.0013473

ABSTRACT: # Background Leptospirosis is an emerging zoonotic disease with high incidence in tropical regions such as the Peruvian Amazon. Although it affects individuals of all ages, knowledge about its clinical and epidemiological profile in children under 5 years remains limited. In this age group, leptospirosis may present with nonspecific manifestations, which may hinder timely recognition in primary care. # Methodology We conducted a retrospective cross-sectional study using secondary data from medical records and epidemiological forms of MAT-confirmed leptospirosis cases evaluated between 2022 and 2024 at four primary health care centers in Belén, Loreto, Peru. A total of 2,325 patients with clinical suspicion of leptospirosis were evaluated during the study period, of whom 400 MAT-confirmed cases with sufficient information for analysis were included. Comparisons between patients under 5 years and those aged 5 years or older were exploratory. # Results Among the 400 confirmed cases, 28 occurred in children under 5 years. In this age group, the most frequently recorded symptoms were malaise (78.6%) and fever (71.4%). Half of the children under 5 years lived in flood-prone areas, and 46.4% were evaluated within the first 3 days after symptom onset. Compared with older patients, children under 5 years more often showed nonspecific symptom profiles, whereas headaches and chills were less frequently recorded. Nutritional classification and selected symptom patterns also differed between age groups, although these comparisons were exploratory and based on a small pediatric sample. # Conclusion In this series of MAT-confirmed leptospirosis cases managed at the primary health care centers, children under 5 years commonly presented with nonspecific symptoms such as malaise and fever. In an endemic Amazonian setting where multiple febrile illnesses coexist, this pattern may hinder early recognition. These findings support the need to strengthen clinical suspicion, diagnostic capacity, and epidemiological surveillance for pediatric leptospirosis in primary care. Further studies with larger pediatric samples are needed to better characterize age-related differences in presentation.

LANGUAGE OF ORIGINAL DOCUMENT: English

Shcherbinin S.V., Bykovtseva D.A., Bardina N.S., Varkentin A.V.

Ecological niche modeling of pathogenic *Leptospira* spp. and risk prediction of canine leptospirosis occurrence in the Russian Federation

(2026) Pathogens, 15 (7), art. no. 742

DOI: 10.3390/pathogens15070742

ABSTRACT: Leptospirosis remains a significant worldwide zoonotic threat, with domestic dogs playing a pivotal role in pathogen circulation across anthropogenic landscapes. This study aimed to assess the spatial distribution of ecological niches of pathogenic *Leptospira* spp. and conduct epizootic risk mapping within the Russian Federation. A two-stage modeling approach based on the maximum entropy algorithm (MaxEnt) was deployed. At the first stage, the abiotic model revealed the fundamental survival niche of the pathogen, identifying precipitation (700–1200 mm) and temperature (7–12 °C) as critical determinants. The accuracy of this model was $AUC = 0.908 \pm 0.007$. At the second stage, the biotic model achieved a predictive accuracy of $AUC = 0.980 \pm 0.003$, demonstrating that dog population density was the primary driver of risk, exhibiting a distinct threshold pattern (200–300 animals/km²). Furthermore, while rodent density remains the foundational ecological reservoir capable of independent transmission, the presence of additional domestic reservoirs, including livestock and dog populations, synergistically amplifies the transmission pathways, shaping the highest-risk zones within shared environments. These findings indicate distinct spatial risk boundaries within

shared human–animal landscapes, suggesting that domestic dogs function as effective indicators for proactive zoonotic monitoring under the “One Health” framework.

LANGUAGE OF ORIGINAL DOCUMENT: English

Davoodi L., Asdaghi Jahromi H., Soleymani E.

Suspected myocarditis resulting from leptospirosis: a case report from Iran

(2026) SAGE Open Medical Case Reports, 14

DOI: 10.1177/2050313X261460562

ABSTRACT: Leptospirosis is a potentially fatal disease that can lead to dysfunction across multiple organ systems. Although cardiovascular complications are relatively rare, they are frequently underestimated and may result in severe outcomes if not addressed promptly. A 46-year-old farmer presented with complaints of palpitations and chest pain. He reported a history of fever, chills, rigors, diaphoresis, myalgia, nausea, low back pain, and headaches that began 7 days prior. An electrocardiogram showed diffuse T-wave inversions and sinus tachycardia; a troponin test was positive, indicating myocardial injury. Echocardiography revealed generalized wall motion abnormalities and left ventricular systolic dysfunction. After 5 days of antibiotic treatment and a 3-day course of corticosteroids, the patient fully recovered and was discharged without any complications. His angiography was normal, and leptospiral IgM was highly positive. Severe leptospirosis should be considered a potential cause of myocarditis, especially in patients with occupational risk factors and those living in endemic regions. Given the non-specific clinical features and diagnostic findings of leptospirosis, it is essential to maintain a high level of suspicion. Timely clinical recognition and laboratory confirmation are crucial, as delays can lead to higher mortality.

LANGUAGE OF ORIGINAL DOCUMENT: English

Xu Q., Hu Y., Liu Z., Xu T., Yu Q.

Prevalence and genetic diversity of zoonotic *Leptospira* and Hantavirus in rodents, Lanxi City, 2023–2025

(2026) Vector-Borne and Zoonotic Diseases

DOI: 10.1177/15303667261474433

ABSTRACT: Background: Leptospirosis (caused by *Leptospira*, a bacterium) and hantavirus disease (caused by hantavirus, a virus) are important zoonoses with rodents as main reservoirs. In this study, we investigated the prevalence and genetic diversity of *Leptospira* and hantavirus in rodents from rural Lanxi City, Zhejiang Province. Rodents showed a higher *Leptospira* carriage rate than the national average. All hantavirus isolates were Seoul virus (SEOV) and displayed high genetic divergence from vaccine strains. Notably, a unique local phylogenetic cluster of *Leptospira borgpetersenii* was identified, indicating potential vaccine mismatch and local evolutionary divergence. Methods: Samples were collected from April 2023 to August 2025, with intensive trapping from April to August annually in 2023–2024 and additional sampling in April 2025. Liver and kidney tissues were collected via aseptic dissection. Real-time fluorescent PCR was used to detect pathogen nucleic acids, and gene sequencing and phylogenetic analysis were performed on positive samples. Results: A total of 350 rodents were captured, with *Rattus norvegicus* (brown rat) as the dominant species (80.00%). The overall *Leptospira* carriage rate was 7.14% (25/350), with the highest rate in *R. norvegicus* (7.86%). The overall hantavirus carriage rate was 1.43% (5/350), distributed mainly in *R. norvegicus* and *Rattus flavipectus* (yellow-breasted rat). No coinfection with both pathogens was detected. Genetic analysis identified 12 *Leptospira* strains as *Leptospira interrogans* and 2 as *L. borgpetersenii*; the latter showed genetic differences from

domestic and foreign strains, suggesting a potential evolutionary trend. The two hantavirus strains were both SEOV, closely related to domestic SEOV strains from 2021 but with only 86.08–86.81% nucleotide homology to vaccine strains (e.g., 80-39, Z37), indicating natural variation. Conclusions: Rodents in rural Lanxi have a relatively high *Leptospira* carriage rate, and hantavirus is dominated by the SEOV type. *R. norvegicus* is the main host of both pathogens. Targeted monitoring and prevention/control measures should be strengthened. Natural genetic variation suggests potential antigenic drift and reduced vaccine matching, which requires further serological validation. Attention should be paid to the impact of pathogen genetic variation on control efforts.

LANGUAGE OF ORIGINAL DOCUMENT: English

Li X., Wen H., Wen F., Liu Z.

Veno-venous extracorporeal membrane oxygenation support for severe leptospirosis complicated by pulmonary hemorrhage and refractory acute respiratory distress syndrome: a case report and literature review

(2026) *Medicine (United States)*, 105 (32), art. no. e50167

DOI: 10.1097/MD.00000000000050167

ABSTRACT: Rationale: – Leptospiral pulmonary hemorrhage syndrome is a rare but life-threatening manifestation of leptospirosis and is frequently complicated by acute respiratory distress syndrome, with persistently high mortality. Using veno-venous extracorporeal membrane oxygenation (VV-ECMO) in this setting remains challenging because systemic anticoagulation may exacerbate pulmonary bleeding. Patient concerns: – A 58-year-old male farmer presented with high fever, myalgia, and rapidly progressive dyspnea following possible environmental exposure. He developed severe hypoxemia accompanied by diffuse pulmonary hemorrhage and multi-organ dysfunction. Diagnoses: – According to clinical presentations, radiologic findings, and next-generation sequencing of peripheral blood, the diagnosis of severe leptospirosis complicated by pulmonary hemorrhage and refractory acute respiratory distress syndrome was established. Interventions: – Despite lung-protective mechanical ventilation and adjunctive prone positioning, hypoxemia persisted. VV-ECMO was initiated as rescue therapy using an individualized anticoagulation strategy. Continuous renal replacement therapy with regional citrate anticoagulation was employed to minimize systemic anticoagulant exposure. Pathogen-directed antimicrobial therapy was promptly instituted following microbiological confirmation. Outcomes: – The patient exhibited progressive improvement in oxygenation and organ function. VV-ECMO was successfully weaned after 6 days, followed by extubation and transfer out of the intensive care unit with stable respiratory status. Lessons: – VV-ECMO may be considered a viable therapy for life-threatening hypoxemia in leptospiral pulmonary hemorrhage when the underlying disease is potentially reversible. Individualized anticoagulation strategies and continued application of lung-protective measures, including prone positioning when feasible, are critical to optimizing outcomes.

LANGUAGE OF ORIGINAL DOCUMENT: English

Graf P.J., Chu X., Davies J., Hickey P.W., Blyth D.M.

Burden, epidemiology, and clinical characteristics of leptospirosis within the United States Military Health System

(2026) *American Journal of Tropical Medicine and Hygiene*, 115 (2), pp. 263 - 270

DOI: 10.4269/ajtmh.25-0690

ABSTRACT: Leptospirosis is a global zoonosis with varying severity that remains underreported due to diagnostic limitations. We analyzed the burden, epidemiology, and clinical characteristics of leptospirosis diagnoses in the Military Health System, which includes care to more than 1.3 million active-duty service members and 6.5 million retirees and dependents worldwide. Potential diagnoses were identified by leptospirosis-specific International Classification of Diseases (ICD)-9 and ICD-10 codes or laboratory tests between January 1, 2013 and December 31, 2021. Upon chart review they were classified per U.S. CDC case definitions. Of 296 identified potential leptospirosis cases, there were 11 confirmed, 134 probable, and 53 possible cases. The majority of cases were young adult males. Japan, Guam, and Hawaii were the most common areas of exposure. Most cases were associated with freshwater exposures, both from recreational and occupational exposures (including a significant number associated with jungle warfare training in Okinawa). Confirmed cases were statistically more likely to be diagnosed in Hawaii. This study from a worldwide distributed unified health system reaffirms the global distribution and wide range of clinical severity of leptospirosis. It highlights the relatively few confirmed diagnoses in the setting of diagnostic limitations even in a population already presumed to be at elevated risk. Strategies and improved diagnostics are needed to shift clinician practice to pursue confirmatory testing, particularly in cases with a high suspicion or high-risk of exposure. Recent improvements in availability and performance of various testing methodologies (multiplex polymerase chain reaction based assays and serological testing) may further define the epidemiology of this global disease.

LANGUAGE OF ORIGINAL DOCUMENT: English

Martinez M.E., Duignan P.J., Prager K.C., Field C.L., Gomes M.E., Mani R., Carswell L., Tinker T., Tomoleoni J., Murray M., Chang R.K., Lloyd-Smith J.O., Miller M.

Fatal leptospirosis in southern sea otters from Central California: pathologic findings and detection of *Leptospira interrogans*

(2026) *Frontiers in Marine Science*, 13

DOI: 10.3389/fmars.2026.1784055

ABSTRACT: *Leptospira interrogans* serovar Pomona infections cause periodic outbreaks in California sea lions (CSLs; *Zalophus californianus*) and sporadic deaths in phocids. However, the frequency of infection and associated health impacts remain uncharacterized in sympatric threatened southern sea otters (SSOs; *Enhydra lutris nereis*), which serve as important sentinels of coastal health. Given the broad impacts of *L. interrogans* on other marine mammals, our objective was to screen selected SSOs for infection, determine whether leptospirosis contributes to SSO mortality, and describe leptospiral-associated lesions. A retrospective review (2005–2025) identified 19 candidate cases that underwent detailed review, including *Leptospira* immunohistochemistry (IHC), serology, and polymerase chain reaction (PCR), with a special focus on renal and hepatic lesions. Kidney samples were PCR-positive for 74% (14/19) of suspected cases. For eight of these, DNA sequence-based serogroup typing detected *L. interrogans* serogroup Pomona. Seven of the 14 PCR-positive leptospirosis cases were classified as fatal based on positive renal IHC and moderate to severe tubulointerstitial nephritis. All fatal cases had anti-*L. interrogans* serovar Pomona antibody titers $\geq 1:25$, 600. The remaining seven PCR-positive cases were considered nonfatal leptospirosis due to minimal and/or unrelated renal lesions and negative IHC. Nonfatal *Leptospira*-infected cases ranged from seronegative to low positive (1:400) for serovar Pomona. Antibody titers for *Leptospira* PCR-negative cases were negative. In fatal cases, gross renal changes were often inapparent or characterized by miliary white cortical foci. Renal

histologic lesions included tubulointerstitial nephritis, acute tubular necrosis, and suppurative tubulitis with intratubular bacteria, along with positive IHC staining for leptospiral antigen in the lesions. Gross hepatic changes were also inapparent in fatal cases, and histologic lesions were rare, characterized in one animal by hepatocellular dissociation and in two sea otters by limited leptospiral antigen detection by IHC. Most *Leptospira*-infected sea otters (71%, 10/14) stranded during higher rainfall months in California, suggesting possible land-to-sea transmission from terrestrial hosts. Given these findings, and because *L. interrogans* serovar Pomona infections have been confirmed in sympatric CSLs and terrestrial mammals from adjacent watersheds, a focused investigation of potential marine and terrestrial disease transmission dynamics could provide new information to reduce SSO mortalities.

LANGUAGE OF ORIGINAL DOCUMENT: English

Gupta N., Kumar T.P., Van Den Broucke S., Vlieghe E., Bottieau E.

Simple clinical decision model for predicting leptospirosis: a secondary analysis of a randomized controlled trial

(2026) Transactions of the Royal Society of Tropical Medicine and Hygiene, 120 (8), pp. 873 - 878

DOI: 10.1093/trstmh/trag046

ABSTRACT: Background: Leptospirosis is a major cause of febrile illness in tropical regions, but early diagnosis is challenging due to overlapping clinical features and delayed serological confirmation. We developed a simple bedside decision model using readily available clinical variables. Methods: This secondary analysis used archived data from a randomized controlled trial of adults with undifferentiated febrile illness (October 2020–February 2021) of 5–15 days' duration. Independent predictors of IgM-ELISA positive leptospirosis were identified using multivariable logistic regression. A simplified score assigning one point per predictor was derived. Discrimination was assessed using ROC analysis, and post-test probabilities were modelled for clinical combinations and simulated rapid diagnostic testing. Results: Among 190 patients, 48 (25.3%) were serologically positive for leptospirosis. Conjunctival suffusion, icterus and acute kidney injury were independent predictors. The score (0–3) showed good discrimination (AUC 0.801), with sensitivity 68.8% and specificity 82.4% at ≥ 2 . An exploratory proteinuria-based model demonstrated moderate discrimination (AUC 0.741). Probability increased from 25% at baseline to 91% when all three predictors were present and to 97%–99% when combined with a positive rapid test. Conclusions: A simple bedside score substantially increases the probability of diagnosing leptospirosis in patients with undifferentiated febrile illness of 5–15 days' duration, particularly when integrated with rapid testing.

LANGUAGE OF ORIGINAL DOCUMENT: English

Barbee H., Sebastián I., Tokumon R., Wang Y., Yamashiro T., Toma C.

Proteasome-dependent cytoskeleton disruption during *Leptospira interrogans* infection induces aberrant collective cell migration

(2026) PLoS pathogens, 22 (8), pp. e1014501

DOI: 10.1371/journal.ppat.1014501

ABSTRACT: *Leptospira interrogans* is a causative agent of leptospirosis, a potentially life-threatening zoonotic disease. A major symptom of severe leptospirosis is acute kidney failure; this is characterized by the detachment of renal proximal tubule epithelial cells (RPTECs) from the basement membrane, which can lead to chronic kidney disease. The kidneys possess an intrinsic ability to self-repair following acute injury through

collective cell migration; this process involves the movement of cells as cohesive units. Mechanical forces transmitted between cells via mechanosensors are important for this migration process. *L. interrogans* induces the displacement of mechanosensors from the plasma membrane, which can be prevented by inhibitors of eukaryotic proteolytic pathways. However, the effects of mechanosensors dysfunction on epithelial repair processes have not been investigated yet. Therefore, the aim of this study was to analyze proteasomal inhibition during epithelial barrier disruption and elucidate epithelial repair mechanisms by examining collective migration of infected RPTECs. We performed a proteome-wide analysis of protein ubiquitination in infected-RPTECs to understand the effect of proteasomal inhibitors. Moreover, we detected increased ubiquitination of ADP-ribosylation factor-like protein 2 (ARL2), a protein involved in microtubule dynamics. Immunofluorescence analysis revealed that *L. interrogans* induces proteasome-dependent disruption of the microtubule and F-actin cytoskeletal network. Scratch assays revealed aberrant collective cell migration and delayed wound healing in *L. interrogans*-infected RPTECs. Wound healing was improved by proteasomal inhibition followed by the addition of epidermal growth factor. In conclusion, our findings suggest that *L. interrogans* alters the circuit integrating mechanosensors at cell-cell contact junctions and the supracellular F-actin and microtubule cytoskeletal network, thereby disrupting epithelial repair responses.

LANGUAGE OF ORIGINAL DOCUMENT: English

Yang S., Cheng Z., Zheng B., Liang Q., Zhang M., Lu Y.

Epidemiological characteristics of leptospirosis and animal surveillance in a high-risk rural area of Eastern China

(2026) Vector-Borne and Zoonotic Diseases

DOI: 10.1177/15303667261474419

ABSTRACT: Background: Leptospirosis is a globally distributed zoonotic disease that remains a significant public health concern, yet integrated evidence linking human infection, animal reservoirs, and *Leptospira* serogroups remains limited. Pan'an County, a rural sentinel site in eastern China, provides a suitable setting for investigating leptospirosis transmission within a One Health framework. This study aimed to characterize epidemiological patterns in humans and associated animal infections, providing evidence for understanding leptospirosis transmission. Methods: A retrospective and field-based surveillance study was conducted from 2007 to 2025. Descriptive methods were used to analyze temporal, spatial, and demographic characteristics of human leptospirosis cases. Animal surveillance was conducted across multiple host species to assess infection status and *Leptospira* serogroup distribution. Correlation analysis was performed to evaluate associations between rodent density, infection status, and human leptospirosis cases. Results: A total of 53 human leptospirosis cases were reported, with a marked peak in 2007 and no fatalities. Cases were concentrated in late summer and primarily affected middle-aged farmers, with no significant spatial clustering observed. Animal surveillance identified 5630 samples with an overall positivity rate of 2.58%. Infections were detected in rodents, frogs, and ducks, while pigs and cattle were negative. Rodents and frogs were exclusively associated with *Icterohaemorrhagiae*, whereas ducks exhibited multiple serogroups. Rodent density was positively correlated with human cases, while no association was observed between infection positivity rates and human incidence. Conclusion: Leptospirosis in Pan'an is characterized by a stable *Icterohaemorrhagiae*-dominated transmission system primarily maintained by rodent reservoirs, with human infection occurring through occupational and environmental exposure in agricultural settings. Aquatic-associated animals such as frogs and ducks likely function as environmental interface hosts within a One Health transmission framework.

These findings suggest a rodent-associated transmission cycle and support the value of integrated human–animal–environment surveillance for leptospirosis control in rural endemic regions.

LANGUAGE OF ORIGINAL DOCUMENT: English

Shirani D., Kiani F.Z., Saeednia Z.

Acute canine leptospirosis complicated by urinary bladder stones in a Shih Tzu dog

(2026) Veterinary Record Case Reports, 14 (3), art. no. e70526

DOI: 10.1002/vrc2.70526

ABSTRACT: Leptospirosis is an important zoonotic bacterial disease with increasing global prevalence. Concurrent canine leptospirosis and urinary obstruction resulting from urolithiasis are rare. We report a 3-year-old male Shih Tzu dog diagnosed with acute canine leptospirosis by PCR, presenting with vomiting, abdominal pain, icterus, severe dehydration and brown-coloured urine. Abdominal ultrasonography revealed urinary bladder and obstructive urethral stones. Complete blood count, serum biochemistry and urine analysis were performed. Haematological analysis revealed severe thrombocytopenia and leukocytosis with left shift. Serum biochemistry showed bilirubinemia and increased hepatic and renal parameters. Urine analysis revealed bilirubinuria, haemoglobinuria and bacteriuria. Treatment with doxycycline and fluid therapy was initiated and continued for 2 weeks. After stabilisation, the patient was referred to the surgical department for cystotomy. This case emphasises the importance of early recognition and appropriate management of leptospirosis, particularly when complicated by urolithiasis, and also emphasises the need for clinicians to maintain a comprehensive perspective on concurrent diseases.

LANGUAGE OF ORIGINAL DOCUMENT: English

Mori H., Miyahara S., Saito M.

A hamster model of Jarisch–Herxheimer–like reaction in experimental leptospirosis associated with IL-6 upregulation and enhanced macrophage phagocytosis

(2026) Microbial Pathogenesis, 219, art. no. 108761

DOI: 10.1016/j.micpath.2026.108761

ABSTRACT: The Jarisch–Herxheimer reaction (JHR) is an acute inflammatory response that can occur after antimicrobial treatment of spirochetal infections, and it can lead to organ dysfunction. However, no established animal model exists for investigating its pathophysiology. In this study, female golden Syrian hamsters were experimentally infected with *Leptospira interrogans* and treated with aminobenzylpenicillin (ABPC) to evaluate antibiotic-associated physiological and immunological changes. Vital signs were monitored under anesthesia, and a JHR-like reaction (JHR-LR) was operationally defined as a marked change in heart rate occurring exclusively after antimicrobial administration. Bacterial burden, cytokine expression, and histopathological findings were analyzed. In vitro macrophage stimulation assays were also performed. Transient tachycardia was observed in a subset of infected hamsters following ABPC administration, most frequently at 5 days post-infection. This response was accompanied by increased IL-6 and IP-10/CXCL10 mRNA expression in the blood and enhanced macrophage phagocytosis of leptospires in the liver and spleen. In vitro, antibiotic-killed leptospires induced significantly higher IL-6 production in macrophages than live bacteria. Importantly, despite comparable bacterial burdens, marked JHR-LR occurs predominantly in animals with preserved body weight, suggesting that host physiological conditions rather than bacterial load alone influence the development of this

reaction. These findings provide preliminary evidence that hamsters may develop antibiotic-associated inflammatory responses resembling JHR and support the utility of this model for future mechanistic studies.

LANGUAGE OF ORIGINAL DOCUMENT: English

Little P.R., Collins-Emerson J.M., Hodge A., Notcovich S., Moutafis G., Littlejohn S., Clough W.J.

Efficacy of a *Leptospira borgpetersenii* serovar Tarassovi vaccine against urinary shedding of *L. borgpetersenii* strain Pacifica in naturally exposed cattle

(2026) New Zealand Veterinary Journal

DOI: 10.1080/00480169.2026.2708016

ABSTRACT: Aim: To evaluate the efficacy of an inactivated, whole-cell *Leptospira borgpetersenii* serovar Tarassovi vaccine for prevention of urinary shedding of *L. borgpetersenii* strain Pacifica, in naturally challenged cattle. Methods: Three dairy farms in Northland, NZ, endemically infected with Pacifica, participated in a randomised controlled trial. Female calves (n = 291), aged 3–7 weeks, were randomly allocated in equal proportion to vaccinated and control groups. Two doses of test vaccine or saline were administered 4 weeks apart, then booster doses at 6 and 18 months. Blood and urine samples were collected once or twice between weeks 71 and 93, for determination of Tarassovi serology and shedding of pathogenic *Leptospira* by urine PCR, with subsequent amplicon sequencing of PCR-positive samples. For each farm separately, and pooled results from Farms 1 and 2, the proportion of animals shedding *Leptospira* in each group was compared statistically, and vaccine efficacy (VE) calculated. Results: A strong serological response to Tarassovi was demonstrated following two vaccine doses. Between weeks 81 and 93, when study heifers were 17–20 months old, a high proportion of unvaccinated controls were seropositive to Tarassovi (100%, 89% and 83% on Farms 1–3, respectively), consistent with exposure to Pacifica on each farm. On Farm 1, 13/30 (43%) controls and 0/29 vaccinates were shedding pathogenic *Leptospira* in urine, representing VE of 100% (95% CI = 73–100%; $p < 0.001$); Pacifica was confirmed in eight control animals, also representing efficacy of 100% (95% CI = 49–100%; $p = 0.005$). On Farm 2, 6/73 (8%) controls and 1/72 (1%) vaccinates were shedding pathogenic *Leptospira*; however, the difference was not significant ($p = 0.116$). On Farms 1 and 2 combined, 19/103 (18%) controls and 1/101 (1%) vaccinates were shedding pathogenic *Leptospira*, representing VE of 95% (95% CI = 70–100%; $p < 0.001$). On Farm 3, one unvaccinated control was found to be shedding, and no vaccinates. No other serovars of *Leptospira* were identified on any farm by urine PCR. Conclusions: The Tarassovi vaccine conferred a very high level of protection (95–100% efficacy) against urinary shedding of *L. borgpetersenii* strain Pacifica in cattle, following two doses in calves and booster vaccinations at 6 and 18 months. Clinical relevance: Given the serious zoonotic risk of leptospirosis, and the emergence of Pacifica as an important strain in NZ cattle, incorporation of an effective Tarassovi vaccine in standard leptospiral vaccination programmes is highly recommended.

LANGUAGE OF ORIGINAL DOCUMENT: English

Bison I., Costa Audisio Filho A., Dias G.F., Santos J.R.S., Araújo J.L., Silva Cristiny M.L.R., Santos De Azevedo S., Parentoni R.N., Carvalho Rannier Ribeiro L.A., Brasil De Lima A.W.

Molecular and serological detection of *Leptospira spp.* in wildlife from Paraíba, Brazil

(2026) Frontiers in Veterinary Science, 13, art. no. 1904553

DOI: 10.3389/fvets.2026.1904553

ABSTRACT: Leptospirosis is a widespread zoonotic disease caused by pathogenic *Leptospira* spp., affecting humans, domestic animals, and wildlife. Wild mammals are recognized as potential maintenance hosts for pathogenic *Leptospira* spp., and some species may act as asymptomatic reservoirs, representing a potential public health risk, especially in areas with increasing human-wildlife interaction. This cross-sectional study investigated the occurrence of pathogenic *Leptospira* spp. in wild mammals from Paraíba, Brazil, sampled between June 2022 and June 2023 using serological and molecular approaches. Blood samples from 60 animals were analyzed by the microscopic agglutination test (MAT), while tissue samples from 29 animals were evaluated by polymerase chain reaction (PCR) targeting the lipL32 gene, a marker specific for pathogenic *Leptospira* spp. Seroreactivity was detected in 9/60 animals (15.0%), with reactions against the serogroups Pomona, Hebdomadis, Grippotyphosa, Shermani, Patoc, and Pyrogenes. Pathogenic *Leptospira* DNA was detected in 6/29 animals (20.7%), with positive PCR results obtained from multiple tissues, including the kidneys, bladder, liver, brain, and reproductive organs. These findings demonstrate exposure to and infection by pathogenic *Leptospira* spp. in wild mammals from Paraíba and reinforce the importance of wildlife surveillance for a better understanding of the epidemiology of leptospirosis.

LANGUAGE OF ORIGINAL DOCUMENT: English

Agarwal A., Choudhary S., Agarwal A., Raval H., Patel R.

AUTHOR FULL NAMES: Agarwal, Arun (57203886779); Choudhary, Sachin (60652868000); Agarwal, Aakanksha (57158228600); Raval, Hetashree (60794052900); Patel, Roshan (60794397500)
57203886779; 60652868000; 57158228600; 60794052900; 60794397500

Beyond fever - the changing face of acute leptospirosis: a retrospective observational study from Western India

(2026) Journal of Association of Physicians of India, 74 (8), pp. 18 - 24

DOI: 10.59556/japi.74.1661

ABSTRACT: Background: Leptospirosis is a zoonotic infection caused by pathogenic *Leptospira* species and remains a significant cause of acute febrile illness in tropical regions. Its clinical spectrum ranges from mild, self-limiting illness to severe multi-organ dysfunction. The disease is broadly classified into anicteric and icteric (Weil's disease) forms, the latter associated with jaundice and increased morbidity. In India, diagnosis is often challenging due to overlapping features with other endemic infections such as dengue and scrub typhus. Coinfections and changing epidemiological patterns, including increasing urban cases, further complicate clinical assessment. This study evaluated the demographic profile, clinical characteristics, organ involvement, coinfections, severity, management, and outcomes of adults hospitalized with acute leptospirosis, with comparison between icteric and anicteric phenotypes. Materials and methods: This retrospective observational study included 78 adults with laboratory-confirmed acute leptospirosis admitted over 30 months to a tertiary care hospital in Rajasthan, India. Diagnosis was established by positive *Leptospira*-specific immunoglobulin M (IgM) serology (>11 NTU) and/or polymerase chain reaction (PCR). Data regarding demographics, comorbidities, clinical features, organ involvement, coinfections, treatment, and outcomes were extracted from medical records. Organ involvement was defined using predefined clinical and laboratory criteria across major systems. Severe disease was defined as dysfunction of two or more organ systems. Icteric leptospirosis was defined by clinical jaundice and/or serum bilirubin ≥ 3 mg/dL. Coinfections were confirmed through appropriate laboratory testing. Continuous variables were expressed as median (interquartile range) and categorical variables as frequency (%). Subgroup comparisons were performed using the Mann-Whitney U test and

Fisher's exact test. Results: The median age was 57 years (interquartile range 41–68), with slight male predominance (52.6%). Although 59% of patients were from rural areas, 41% were urban residents. Hypertension (25.6%) and diabetes mellitus (29.5%) were common comorbidities, while 42.3% had no prior illnesses. Anicteric disease predominated (84.6%), and 15.4% had icteric leptospirosis. Fever was present in 93.6% of patients. Hepatic (69.2%) and respiratory (66.7%) involvement were most frequent, and multi-organ dysfunction occurred in 61.5%. Coinfections were identified in 52.6% of cases, most commonly dengue (17.9%) and scrub typhus (14.1%). Coinfected patients were younger and had fewer comorbidities, with lower rates of renal, respiratory, and neurological involvement and reduced need for ventilatory support. Icteric patients were significantly younger (median 31.5 vs 58 years) and had longer hospital stays (10.5 vs 7 days). Hepatic involvement was universal in the icteric group, and secondary hemophagocytic lymphohistiocytosis (HLH) was markedly more frequent. Mortality was higher among icteric patients but did not reach statistical significance. Mechanical ventilation was required in 10.3% of patients. The median hospital stay was 7 days, and overall mortality was 2.6%, with both deaths occurring in patients with severe multi-organ dysfunction. Conclusion: Acute leptospirosis exhibits diverse clinical presentations with frequent multi-organ involvement in hospitalized adults. Coinfections are common but did not consistently worsen outcomes. Icteric disease represents a more severe phenotype associated with greater complications and prolonged hospitalization. Early diagnosis and timely supportive management are critical to achieving favourable outcomes in endemic settings.

LANGUAGE OF ORIGINAL DOCUMENT: English