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BOLLETTINO BIBLIOGRAFICO

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Garona J., Berard A., Tatard C., Kwasiborski A., Gauthier P., Ag Atteynine S., Hourdel V., Eusebe A., Diagne C., Caro V., Brouat C., Charbonnel N., Sauvage V., Granjon L., Castel G.

Detection of two zoonotic pathogens, Seoul orthohantavirus and pathogenic Leptospira, in rats of Bamako, Mali (2021−2023)

(2025) One Health, 20, art. no. 101085

DOI: 10.1016/j.onehlt.2025.101085

ABSTRACT: Seoul orthohantavirus (SEOV) and pathogenic leptospires, two zoonotic agents causing similar symptoms in humans, were investigated in rat populations across several neighborhoods in Bamako, Mali. SEOV seroprevalence in brown rats (Rattus norvegicus) reached 14.8 %, while no infection was detected in black rats (Rattus rattus). Pathogenic leptospires were found in 8.7 % of brown rats, with significant inter-neighborhood variations, while only one black rat tested positive. Viral genetic analyses suggested that SEOV strains circulating in Bamako may result from a reassortment between two SEOV lineages. These findings highlight the widespread distribution of SEOV and the localized presence of pathogenic leptospires in Bamako, emphasizing the role of brown rats as reservoirs. These results can guide municipal authorities in implementing rodent control and prevention strategies to mitigate associated public health risks in Bamako.

LANGUAGE OF ORIGINAL DOCUMENT: English

Vidanović D., Vasković N., Dmitrić M., Tešović B., Debeljak M., Stojanović M., Budinski I.

Identification and characterization of viral and bacterial pathogens in free-living bats of Kopaonik National Park, Serbia

(2025) Veterinary Sciences, 12 (5), art. no. 401

DOI: 10.3390/vetsci12050401

ABSTRACT: This pilot study investigated the presence of potentially zoonotic microorganisms in bat species from Kopaonik National Park, Serbia. A total of 40 individuals from 12 bat species were sampled and screened using microbiological and molecular methods. Salmonella spp., Chlamydia spp., Coxiella burnetii, Francisella tularensis, Leptospira spp., Lyssavirus, Filoviridae, henipaviruses, and SARS-CoV-2 were not detected in any bats. Coronavirus genomes were confirmed in four bats—one Myotis brandtii, two Myotis daubentonii, and one Myotis cf. mystacinus. Sequence analysis identified the presence of alphacoronavirus genomes with high similarity to strains previously found in Europe. Mycoplasma spp. genomes were found in 18 bats (45%), and Rickettsia spp. were detected in five bats (12.5%), although species-level identification was not possible. The findings highlight the presence of certain bacteria and viruses in bats that could have implications for public health, especially in areas with close human–wildlife interaction. Although no direct evidence of high-risk pathogens was found, the results support the importance of continued surveillance and ecological studies on bats, given their role as potential reservoirs. Monitoring bat-associated microorganisms is essential to better understand possible transmission routes and improve the prevention of emerging zoonotic diseases.

LANGUAGE OF ORIGINAL DOCUMENT: English

Kottarath N., Hari M., Selvam P.K., Vasudevan K.

Unraveling the role of antimicrobial proteins in leptospirosis: a comprehensive transcriptomic analysis

(2025) Advances in Protein Chemistry and Structural Biology

DOI: 10.1016/bs.apcsb.2024.11.015

ABSTRACT: Leptospirosis, caused by Leptospira bacteria, poses a significant global health threat with notable mortality rates. This study employs advanced transcriptomics to explore the complex interactions between

host and pathogen, focusing on antimicrobial peptides (AMPs). Genomic data from mice infected with various Leptospira serotypes underwent rigorous quality control, alignment to the Mus musculus genome, and quantification using FeatureCounts. DESeq2 analysis revealed 491 differentially expressed genes (DEGs), shedding light on key molecular pathways crucial to leptospirosis pathogenesis, particularly involving AMP resistance mechanisms. Important molecular functions, KEGG pathways, cellular components, and biological processes linked to AMP resistance were revealed by functional enrichment analysis. These findings underscore roles in stress responses, immune modulation, and stimulus regulation. Utilizing Cytoscape, a protein-protein interaction network identified pivotal hub proteins such as Ptprc, Stat3, Syk, Stat5a, Stat1, Il18, Fcgr3, Jak2, Sell, and Jak1, integral to immune responses, signaling cascades, and cellular processes essential for AMP resistance. This comprehensive analysis provides valuable insights into the mechanisms underlying AMP resistance in leptospirosis. The identified biomarkers hold promise for developing targeted diagnostic tools and therapeutic strategies to combat AMP-resistant leptospirosis strains, potentially alleviating its global health impact. Further validation and comprehensive exploration are crucial to advancing our understanding and enhancing patient care strategies against antimicrobial resistance in leptospirosis.
LANGUAGE OF ORIGINAL DOCUMENT: English

Lestari M.R., Nurcandra F., Buntara A., Simanjorang C.

Determinants and mapping of leptospirosis in Kebumen, Indonesia: case-control study

(2025) African Journal of Infectious Diseases, 19 (2), pp. 49 - 58

DOI: 10.21010/Ajidv19i2.6

ABSTRACT: Background: Leptospirosis is a health concern with a high mortality rate. As of 2022, 9.8% of Indonesians are vulnerable to leptospirosis, and Kebumen Regency has been recognized as an endemic area since 2012. This study aims to identify the determinants and map the incidence of leptospirosis in Kebumen, Indonesia, in 2023. Material and Methods: This study used a 1:1 sample of 53 cases and 53 controls in a case-control study design. Each group was sampled using a purposive sampling technique. Cases were defined as individuals seeking care at a health center or hospital and identified as leptospirosis patients in 2023, while controls were individuals living nearest to the cases. Data analysis for this study involved the use of a logistic regression model. Results: Individuals with a history of wounds have 40.20 times higher odds of experiencing leptospirosis. Men have 2.58 times higher odds of experiencing leptospirosis, while poor use of personal protective equipment (PPE) increases the odds by 2.27. Leptospirosis risk is elevated in areas where rats and standing water are prevalent, as these factors are typically found nearby. Furthermore, pets at risk are commonly found in high-risk areas. Conclusion: History of wounds, sex, and use of PPE are factors that can predict the incidence of leptospirosis. Environmental determinant mapping is observed in high-density, geographically proximate locations.
LANGUAGE OF ORIGINAL DOCUMENT: English

Orlando S.A., Sanchez E., Mora-Jaramillo N., Jiménez Valenzuela F., León-Sosa A., Rivera A., Matamba E., Macias G., Martinez G., Piña A., Huartanga J., Solis V., Paez K., Sumoy Velez P., Arcos F., Rodríguez-Pazmiño A.S., García-Bereguiain M.A.

High prevalence and diversity of Leptospira pathogenic serovars in synanthropic fauna from Guayaquil city in Ecuador

(2025) Acta Tropica, 267, art. no. 107677

DOI: 10.1016/j.actatropica.2025.107677

ABSTRACT: Leptospirosis is a globally distributed zoonotic disease that affects animal production systems and leads to mortality among its hosts. In Ecuador, this disease is endemic, with records dated from the late 19th century, and adversely impacts numerous animal species. We assessed the seroprevalence and diversity of Leptospira serovars in synanthropic fauna including stray dogs, cats and rats from Guayaquil city in Ecuador using the Microagglutination Test (MAT). Our findings revealed a wide diversity of the 24 serovars studied, affecting all animal species, with Pomoma, Sejroe, Bataviae and Saxkoebing as the most prevalent ones. Moreover, the prevalence of antibodies against Leptospira infection was extremely high with values of 94.7 % (CI 95 %: 76.1–100), 82.1 % (CI 95 %: 66–98.1) and 83.6 % (CI 95 %: 67.2–99.9) in dogs, cats and rats, respectively. Our findings support previous reports showing that leptospirosis is endemic in Ecuador and affects multiple animal species. Moreover, our results would suggest the potential role of synanthropic fauna as a reservoir for Leptospira in urban settings although further research involving Leptospira PCR diagnosis and culture isolation is needed. Therefore, we strongly recommend incorporating a comprehensive approach for surveillance and control of leptospirosis in Ecuador from a One Health perspective.
LANGUAGE OF ORIGINAL DOCUMENT: English

Nisa S., Ortolani E., Vallée E., Marshall J., Collins-Emerson J., Yeung P., Prinsen G., Wright J., Quin T., Fayaz A., Littlejohn S., Baker M.G., Douwes J., Benschop J.

Case-control study of leptospirosis in Aotearoa New Zealand reveals behavioural, occupational, and environmental risk factors

(2025) Epidemiology and Infection, 153, art. no. e67
DOI: 10.1017/S0950268825100071

ABSTRACT: Leptospirosis in NZ has historically been associated with male workers in livestock industries; however, the disease epidemiology is changing. This study identified risk factors amid these shifts. Participants (95 cases:300 controls) were recruited nationwide between 22 July 2019 and 31 January 2022, and controls were frequency-matched by sex (90% male) and rurality (65% rural). Multivariable logistic regression models, adjusted for sex, rurality, age, and season - with one model additionally including occupational sector - identified risk factors including contact with dairy cattle (aOR 2.5; CI: 1.0-6.0), activities with beef cattle (aOR 3.0; 95% CI: 1.1-8.2), cleaning urine/faeces from yard surfaces (aOR 3.9; 95% CI: 1.5-10.3), uncovered cuts/scratches (aOR 4.6; 95% CI: 1.9-11.7), evidence of rodents (aOR 2.2; 95% CI: 1.0-5.0), and work water supply from multiple sources - especially creeks/streams (aOR 7.8; 95% CI: 1.5-45.1) or roof-collected rainwater (aOR 6.6; 95% CI: 1.4-33.7). When adjusted for occupational sector, risk factors remained significant except for contact with dairy cattle, and slaughter without gloves emerged as a risk (aOR 3.3; 95% CI: 0.9-12.9). This study highlights novel behavioural factors, such as uncovered cuts and inconsistent glove use, alongside environmental risks from rodents and natural water sources.
LANGUAGE OF ORIGINAL DOCUMENT: English

Severo M.A., Henrique C.L., Araújo S.D.S., Portela R.D.A., Magalhães N.M.D.A., Rocha K.N.D.S., Alves C.J., Batista Santos C.D.S.A., Azevedo S.S.D.

Environmental factors associated with seroprevalence of Leptospira spp. infection in stray and shelter dogs in the Caatinga biome [Fatores ambientais associados com a soroprevalência de infecção por Leptospira spp. em cães errantes e de abrigo no bioma Caatinga]

(2025) Acta Paulista de Enfermagem, 55 (1), art. no. e20240101
DOI: 10.1590/0103-8478cr20240101

ABSTRACT: Leptospirosis is a zoonotic disease that must be studied on the One Health point of view. It is possible that there are particularities in the epidemiology of leptospirosis in Caatinga biome, where the environment is often unfavorable and challenges the adaptability of Leptospira spp. Overall, 100 dogs (47 shelter and 53 stray dogs) selected based on sampling calculation were used to evaluate the Leptospira spp. seroprevalence and associated factors. The microscopic agglutination test (MAT) was applied to detect anti-Leptospira spp. antibodies (cut-off titer 50). Risk factors were identified using the robust Poisson regression analysis. Twenty-four animals (24%; 95% CI = 15.6% - 32.4%) were seroreactive, antibody titers ranged from 50 to 200, and the reacting serogroups were Ballum (17%), Autumnalis (6%) and Djasiman (1%). The factors/categories associated with seropositivity were the environment where the animal stay/soil (prevalence ratio [PR] = 6.03; 95% CI for PR: 1.86 - 7.69; P < 0.001) and access to polluted water/yes (PR = 3.79; 95% CI for PR: 1.85 - 24.22; P = 0.011). The results suggested leptospirosis as a concern in the One Health context in stray and shelter dogs from the Caatinga biome despite the adverse conditions of this biome for the survive of Leptospira spp. on the environment. Moreover, despite being social and government issues, factors such as environment where the animal stay (soil) and access to polluted water must be carefully deemed and corrected to avoid the transmission of leptospires to animals and humans.
LANGUAGE OF ORIGINAL DOCUMENT: English

Perugini E., Ascoli Bartoli T., Carrara S., Maffongelli G., Scorzolini L.

A severe case of sepsis and pneumonia caused by Leptospira in a previously healthy 23-year-old man from Cuba: A case report with literature review

(2025) One Health, 20, art. no. 101097
DOI: 10.1016/j.onehlt.2025.101097
ABSTRACT: Leptospirosis is a re-emerging zoonotic disease that poses significant threats. Its nonspecific symptoms can mimic other febrile illnesses, complicating diagnosis, especially in low-endemic regions like Europe, where clinical awareness among healthcare providers may be limited. Diagnostic challenges also arise in low-resource settings due to restricted access to appropriate testing. Specific antimicrobials are the cornerstone of medical treatment, while the role of systemic steroids in severe cases remains undefined. We present a case of severe sepsis and pneumonia caused by Leptospira in a previously healthy 23-year-old male from Cuba. The main characteristics of the case include severe lung involvement, with the development of respiratory failure despite two days of potentially effective antimicrobial therapy, and the favorable outcome achieved with a combination of intravenous steroids, targeted antibiotic treatment and supportive measures.
LANGUAGE OF ORIGINAL DOCUMENT: English

Rao A.S., H K.P.B., K A., Shenoy R., Keshav L.B., Malhotra K., Nayak S., Poojary R.

Identification of prognostic factors contributing towards mortality in leptospirosis patients: a statistical and score-based model approach

(2025) Discover Applied Sciences, 7 (6), art. no. 568
DOI: 10.1007/s42452-025-07167-y
ABSTRACT: Purpose: The study aims to identify mortality predictors in patients with leptospirosis using statistical and score-based model approaches. Methods: This retrospective study was conducted at a tertiary care hospital in India, involving hospitalized leptospirosis patients. Clinical and biochemical parameters were recorded, and a practical score-based model was developed by calculating risk scores for each attribute. Univariate and multivariate logistic regression analyses were performed to identify significant predictors of

mortality. Survival analysis was also conducted to illustrate the interaction among disease parameters affecting survival probabilities. Results: Out of 164 patients, the majority were under 45 years old, with a survival rate of 84.8%. Univariate logistic regression indicated that patients over 45 years old, and those with thrombocytopenia, acute kidney injury, total bilirubin, and direct bilirubin, were significant predictors of reduced survival. Multivariate logistic regression confirmed that thrombocytopenia, acute kidney injury, and both total and direct bilirubin were the most significant independent predictors of mortality. Gender, duration of hospital stays, Serum Glutamate Pyruvate Transaminase (SGPT), and Serum Glutamic-Oxaloacetic Transaminase (SGOT) levels were not associated with mortality. The model, developed using Logistic Regression (LR) and Ridge Classifier (RC), showed higher scores for thrombocytopenia, acute kidney injury, leukocytosis, and direct bilirubin features, achieving accuracy rates of 89% and 92% respectively. Conclusion: The study suggests that thrombocytopenia, acute kidney injury, leukocytosis, and bilirubin levels are crucial prognostic factors for mortality in leptospirosis patients. The developed model offers an accurate method for early identification of these predictors, enhancing disease prognostics.
LANGUAGE OF ORIGINAL DOCUMENT: English

Istanti Y., Adnani H.

Individual and environmental determinants of leptospirosis in Bantul, Indonesia

(2025) Health Education and Health Promotion, 13 (2), pp. 195 - 204
DOI: 10.58209/hehp.13.2.195

ABSTRACT: Aims Leptospirosis constitutes a significant zoonotic disease with substantial global distribution, particularly affecting tropical and subtropical regions. Despite extensive documentation of its burden, significant knowledge deficits persist regarding localized transmission determinants, particularly concerning the relative contributions of individual versus environmental risk factors. This study aimed to examine the relationship between individual factors (gender, occupation, education) and biotic environmental parameters (flood history, drainage conditions, waste disposal conditions) with leptospirosis incidence in the working area of Kasihan II Bantul Public Health Center during 2022-2023. Instrument & Methods This observational analytical study with a retrospective case-control design was implemented on 34 participants, comprising 17 laboratory-confirmed leptospirosis cases and 17 community-matched controls from the same catchment area. Data collection employed structured questionnaires assessing sociodemographic parameters, occupational exposures, and environmental conditions. The analysis utilized chi-square tests to evaluate associations between independent parameters and leptospirosis status, with odds ratios and corresponding 95% confidence intervals calculated to quantify the magnitude of risk. Findings Significant associations were identified between leptospirosis and male gender (OR=5.760, 95% CI: 1.317-25.187) and high-risk occupations (OR=6.667, 95% CI: 1.377-32.278). Educational attainment and environmental parameters, including flood history, drainage conditions, and waste disposal infrastructure, demonstrated non-significant associations despite elevated risk estimates. Demographic analysis revealed a predominance of middle-aged and older adults (64.8% aged 46-65 years), with a balanced gender distribution and a high prevalence of lower educational attainment (91.2%). Conclusion In the Kasihan II Bantul catchment area, the significant determinants of leptospirosis transmission are male gender and high-risk occupational exposure, while educational status and environmental factors are non-significant determinants.
LANGUAGE OF ORIGINAL DOCUMENT: English

Wei R., Yin J., Li W., Luo Y., Li Z., Li J., Lu J.

Investigation on Leptospira carriage in rodents and Leptospira antibodies in dog serum in three cities/counties of Yunnan Province

(2025) China Tropical Medicine, 25 (5), pp. 594 - 598

DOI: 10.13604/j.cnki.46-1064/r.2025.05.11

ABSTRACT: Objective To investigate the prevalence of Leptospira carriage in rodents in three Cities/Counties of Yunnan, and to detect the seroprevalence of Leptospira antibodies in dog serum. Methods From July to August 2019, natural villages were selected for field rodent trapping in Lianghe County, Mangshi City, and Mile City in Yunnan Province. Following morphological identification of the murine species, kidney tissue was collected for DNA extraction. Conventional PCR was employed to amplify the target gene fragment of the SecY gene of Leptospira. Sequencing was conducted on the positive samples, and the obtained sequences were subjected to homology alignment and phylogenetic tree construction. Femoral arterial blood was collected from dogs in the survey area, and serum samples were collected. Indirect enzyme-linked immunosorbent assay (ELISA) was used to detect IgG antibodies against Leptospira in dog serum. The chi-square (χ2) test was applied to analyze the serum Leptospira antibody status of dogs in relation to various influencing factors. Results A total of 490 rodents were captured. Leptospira carriage was detected through PCR in Rattus tanezumi and Rattus sladeni in Lianghe County, with a carrier rate of 0.41%. No case was detected in Mangshi City and Mile City. Homologous evolution analysis showed that both Leptospira strains were pathogenic Leptospira borgpetersenii. In addition, 305 dog serum samples were collected, among which 16 tested positive for Leptospira IgG antibodies, resulting in a positive rate of 5.25%. Conclusion Both rodents and dog serum in the three Cities/Counties of Yunnan Province were found to be infected with Leptospira, posing a potential risk of disease to humans. It is essential to enhance surveillance and implement preventive and control measures.

LANGUAGE OF ORIGINAL DOCUMENT: Chinese

Musara C., Kapungu F.

Addressing the burden of leptospirosis in Africa

(2025) Tropical Diseases, Travel Medicine and Vaccines, 11 (1), art. no. 16

DOI: 10.1186/s40794-025-00250-7

ABSTRACT: Leptospirosis is a zoonosis of global distribution. The U.S. Centers for Disease Control and Prevention has designated leptospirosis a nationally notifiable disease. There is need to raise awareness of the burden of leptospirosis among health care givers and policy makers in Africa. The aim of this review was to highlight the current situation of leptospirosis in Africa and suggest a One Health approach of addressing its status as a leading zoonosis. In tropical regions, the nonspecific symptoms of fever, myalgia and arthralgia result in misdiagnosis of leptospirosis with malaria, yellow fever, typhoid fever, dengue fever, brucellosis, rickettsiosis, and babesiosis. Urinalysis presents an inexpensive diagnostic aid for leptospirosis. Humans with leptospirosis exhibit proteinuria, glucosuria, pyuria, haematuria and granular casts resulting from acute kidney injury. Therapeutic guidelines for empirical treatment of febrile patients should be considered. Febrile patients who test negative for malaria and yellow fever can benefit from doxycycline, which also treats brucellosis, rickettsiosis and typhoid fever. Control of leptospirosis should also address Leptospira infection in domestic animal reservoirs through vaccination of cattle, sheep, goats, pigs and dogs in endemic areas. Treatment of sick animals with streptomycin eliminates the carrier status, curbing leptospiruria and spread of infection. Rodents are important in transmission of Leptospira to humans in urban slums and rural settings therefore

rodent control strategies help in reducing transmission of leptospirosis. Indirect transmission of Leptospira occurs through contact with water, vegetation, or soil contaminated with infected urine. Drinking water should be drawn from protected sources or chlorinated before household use.
LANGUAGE OF ORIGINAL DOCUMENT: English

Torres F.D., Martinez M.E., Rivard M., Duignan P., Prager K.C., Lloyd-Smith J.O., Di Azevedo M.I.N., Lilenbaum W.

Leptospirosis in marine mammals: an in-depth look at an underexplored ecosystem

(2025) Research in Veterinary Science, 193, art. no. 105760
DOI: 10.1016/j.rvsc.2025.105760
ABSTRACT: Marine mammals are a diverse group that live in, or are fully dependent upon, the ocean and marine food chain. Infection by Leptospira bacteria has been documented in this group of animals and may cause renal pathology, which for some species can lead to morbidity and mortality. Despite its impact on animal health and relevance as a zoonotic pathogen, important aspects of leptospirosis in marine mammals are still minimally explored. In this context, we conducted a systematic review to better understand this infection in marine mammals worldwide. A systematic review of scientific databases was conducted, resulting in 72 papers. They were classified into twelve categories, such as clinical signs, serologic and molecular identification, geographical localization, and other relevant information. North America stands out as the focus for most of the global research on this topic (70.8 % of publications). The most common clinical signs were depression, anorexia, polydipsia, dehydration, vomiting, muscle tremors, abdominal pain, and sometimes seizure-like neurologic signs. Many of these clinical signs can be attributed to Leptospira-related renal failure and electrolyte imbalances. While severe disease and death were often reported, reports of an asymptomatic state in some individuals suggest a potential asymptomatic infection and highlight the possible role of marine mammals as disseminators of Leptospira spp. in a highly fluid ecosystem. Serology was the most used diagnostic method (77.8 %), and Pomona, Gryppotyphosa, and Icterohaemorrhagiae were the most frequently identified serogroups. Regarding direct detection methods, PCR was the most commonly used (38.8 %), while culture was used in 25 % and IHC in 23.6 % of studies. Based on genetic characterization, Leptospira interrogans was the most commonly detected species. To understand the epidemiology of this complex disease, a review of multiple studies demonstrated the importance of an integrative approach, including pathological, biochemical, molecular and phylogenetic analyses, not only to enrich knowledge about marine microbiological biodiversity but also to clarify important key points on the epidemiology and pathophysiology of this important zoonosis in an ecosystem that is still so little explored.
LANGUAGE OF ORIGINAL DOCUMENT: English

Kasiano K.E.J., Alinaitwe L., Okello W., Methodius T., Aturinda C.J., Lubega A., Togo E.S.F., Marin P.M., Onafruo D.K., Jubara A.S., Biryomumaisho S., Kankya C.

Leptospira seroprevalence and associated risk factors among cattle in Bor County, South Sudan

(2025) PLOS ONE, 20 (6 June), art. no. e0325492
DOI: 10.1371/journal.pone.0325492
ABSTRACT: Leptospirosis is a bacterial zoonotic disease that is distributed globally. In livestock, leptospirosis often presents as a subclinical disease that results in significant reproductive and production losses, which could in turn have detrimental economic consequences, particularly in countries like South Sudan that rely on

livestock farming for livelihood. Leptospirosis often presents as a subclinical disease in which case the animal may be a maintenance host for a specific serovar. Recent increases in unexplained abortions have prompted us to investigate Leptospira exposure and associated risk factors among cattle in Bor County South Sudan. A cross-sectional study was conducted between 22nd January to 15th February 2023. Blood samples were collected from 357 cattle in four of the six cattle camps in the County at that time. Seropositivity was determined by detecting anti-Leptospira antibodies in the serum samples by microscopic agglutination test (MAT) based on a panel of 12 serovars representing 12 serogroups. Data on risk factors were obtained using pre-tested questionnaires administered to the owner or herdsman of each sampled herd. Of the 357 cattle sampled, 66.95% (95% CI = 61.91–71.62) were seropositive (cut-off titer ≥100). Seventy-six of the seropositive cattle (21.65%) had MAT titer ≥800, indicating a probable recent infection at the time of sampling. The most prevalent serogroups were L. borgpetersenii Tarassovi (59.83%) and L. borgpetersenii Ballum (17.38%). In the robust Poisson regression model, only the age of cattle was a significant risk factor to Leptospira seroprevalence. The prevalence in adult cattle was 1.43 times higher than in young ones (95% CI 1.09–1.92; P-value = 0.012). The extremely high seroprevalence indicates that leptospirosis may be endemic in cattle in South Sudan, and potentially one of the etiologies for the recently increasing abortion reports. This may require confirmation of the infection status among the aborting cattle.
LANGUAGE OF ORIGINAL DOCUMENT: English

Engida H.A., Theuri D.M., Gathungu D.K., Gachohi J., Alemneh H.T.
A coinfection model of leptospirosis and melioidosis with optimal control
(2025) Journal of Applied Mathematics, 2025 (1), art. no. 6627995
DOI: 10.1155/jama/6627995
ABSTRACT: Leptospirosis and melioidosis are emerging tropical diseases that are seriously affecting both human and animal populations worldwide. The actual incidence and fatal cases of the diseases are underreported due to a lack of awareness of the diseases, underuse of clinical microbiology laboratories test, and limitations of the model. In this paper, a new deterministic mathematical model for the coinfection of leptospirosis and melioidosis with optimal controls is presented. Based on the next-generation matrix approach, the basic reproduction numbers for the coinfection model as well as for submodels are computed to analyze their dynamics behavior. The disease-free equilibrium point of the melioidosis-only submodel is proven to be globally asymptotically stable when the basic reproduction number (R0m) is less than unity, whereas the existence of its unique positive endemic equilibrium is shown if R0m > 1. Based on the center manifold theory, the endemic equilibrium point of the leptospirosis-only submodel is proven to be locally asymptotically stable when the basic reproduction number (R0l) is greater than unity. The disease-free equilibrium point of the full model is locally asymptotically stable whenever the basic reproduction number (R0ml) less than unity. Sensitivity analysis for the basic reproduction number of the model is performed to determine the most influencing parameters on the transmission dynamics of the model. Furthermore, the model was extended into an optimal control problem by incorporating four time-dependent control functions. Pontryagin’s maximum principle was used to derive the optimality system for the optimal control problem. The optimality system was simulated using the forward–backward sweep method to show the effectiveness and cost-effectiveness of different optimal control strategies in combating the burden of leptospirosis–melioidosis coinfection. The incremental cost-effectiveness ratio was applied to determine the most cost-effective strategy. The numerical results revealed that Strategy 6 which implements a combination of all optimal control measures

is the most effective strategy for minimizing the spread of the coinfection of the epidemics, whereas Strategy 1 which implements rodenticide control measure is the most effective when available resources are limited.
LANGUAGE OF ORIGINAL DOCUMENT: English

Schulz É.T., da Costa E.A., Lansarin T.D., von Laer A.E., França R.T.

Anti-Leptospira spp. antibody test in noncaptive reptiles from urban and peri-urban reas in Brazil's extreme South [Pesquisa de anticorpos anti-Leptospira spp. em répteis de vida livre de áreas urbanas e periurbanas do extremo sul do Brasil]

(2025) Acta Paulista de Enfermagem, 55 (1), art. no. e20240067

DOI: 10.1590/0103-8478cr20240067

ABSTRACT: The state of Rio Grande do Sul has a great diversity of reptile species distributed throughout its territory. Due to human actions, such as habitat fragmentation, these animals have been frequently observed in urban and peri-urban environments. This facilitates the spread of pathogens between animals and humans, posing a unique health risk, as many diseases are considered zoonoses. Leptospirosis is among the most common zoonoses in the world and is caused by pathogenic species of bacteria of the genus Leptospira. The role of reptiles in the cycle of this disease is yet unknown. However, serological studies have demonstrated positivity for antibodies against Leptospira spp. in tortoises and snakes, which may indicate that these animals act in maintaining the pathogen in the environment. This observed the presence of anti-Leptospira antibodies in rescued reptiles taken to the Center for Rehabilitation of Wild Fauna and Screening Center for Wild Animals at the Universidade Federal de Pelotas (NURFS-CETAS/UFPEL). Samples were collected from 55 animals (39 Trachemys dorbigni; 3 Philodryas patagoniensis; 3 Caiman latirostris; 3 Salvator merianae; 2 Acanthochelys spixii; 2 Phrynops hilarii; 2 Hydromedusa tectifera; 1 Philodryas aestiva) from August 2022 to December 2023 and tested for 12 reference serovars. Two animals demonstrated positivity, one for the pathogenic serovar Pyrogenes and the other for the pathogenic serovar Canicola. This result reflected the importance of different species besides mammals as potential reservoirs and responsible for maintaining leptospirosis in the environment.
LANGUAGE OF ORIGINAL DOCUMENT: English

Sawesi S., Jadhav A., Rashrash B.

Machine learning and deep learning techniques for prediction and diagnosis of leptospirosis: systematic literature review

(2025) JMIR Medical Informatics, 13, art. no. e67859

DOI: 10.2196/67859

ABSTRACT: Background: Leptospirosis, a zoonotic disease caused by Leptospira bacteria, continues to pose significant public health risks, particularly in tropical and subtropical regions. Objective: This systematic review aimed to evaluate the application of machine learning (ML) and deep learning (DL) techniques in predicting and diagnosing leptospirosis, focusing on the most used algorithms, validation methods, data types, and performance metrics. Methods: Using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, Checklist for Critical Appraisal and Data Extraction for Systematic Reviews of Prediction Modelling Studies (CHARMS), and Prediction model Risk of Bias Assessment Tool (PROBAST) tools, we conducted a comprehensive review of studies applying ML and DL models for leptospirosis detection and prediction, examining algorithm performance, data sources, and validation approaches. Results: Out of a total

of 374 articles screened, 17 studies were included in the qualitative synthesis, representing approximately 4.5% of the initial pool. The review identified frequent use of algorithms such as support vector machines, artificial neural networks, decision trees, and convolutional neural networks (CNNs). Among the included studies, 88% (15/17) used traditional ML methods, and 24% (4/17) used DL techniques. Several models demonstrated high predictive performance, with reported accuracy rates ranging from 80% to 98%, notably with the U-Net CNN achieving 98.02% accuracy. However, public datasets were underused, with only 35% (6/17) of studies incorporating publicly available data sources; the majority (65%, 11/17) relied primarily on private datasets from hospitals, clinical records, or regional surveillance systems. Conclusions: ML and DL techniques demonstrate potential for improving leptospirosis prediction and diagnosis, but future research should focus on using larger, more diverse datasets, adopting transfer learning strategies, and integrating advanced ensemble and validation techniques to strengthen model accuracy and generalization.
LANGUAGE OF ORIGINAL DOCUMENT: English

Kędzierska-Mieszkowska S., Kędzierska B., Pardyak L., Arent Z.

Evidence for a putative regulatory system consisting of an ECF σE-Type Factor, LIC_12757, and a FecR-like σ Factor Regulator, LIC_12756, in the pathogenic Spirochaetes Leptospira interrogans

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ABSTRACT: ECF σ factors, which constitute the most abundant and diverse group of the σ70-family, are important signal response regulatory proteins in bacterial adaptative responses to harsh environmental changes and for bacterial survival. Their activity is commonly controlled by specific and reversible interactions with their cognate anti-σ factors (soluble or transmembrane proteins), which directly or indirectly sense the environmental signals and transmit them to their partner σ factor. The genome of pathogenic L. interrogans is predicted to encode 11 ECF σE-type factors and more than 30 regulators predicted as anti-σ factors, anti-anti-σ factors, and regulators of anti-anti-σ factors. We have recently demonstrated that one of the L. interrogans ECF σ factors, i.e., LIC_12757, indeed functions as a transcriptional factor and is autoregulated at the transcriptional level. This study is a next step towards determining key aspects of LIC_12757 functioning in Leptospira. By using genetic and proteomic approaches, we provide strong evidence that the LIC_12757 activity is controlled via interactions with its putative FecR-like regulator, LIC_12756. We also demonstrate that LIC_12756 exhibits not only an anti-σ activity but also acts as a positive regulator of LIC_12757 in the presence of specific environmental cues. Interestingly, we found that the nutrient-limiting conditions, including iron deficiency, may act as specific signals for the LIC_12757 activation. In conclusion, we identified the L. interrogans regulatory system consisting of an ECF σ factor, LIC_12757, and a FecR-like regulator, LIC_12756, which is most likely involved in the response of pathogenic Leptospira to iron and nutrient limitation, and thus also likely involved in their response to host-induced stress.
LANGUAGE OF ORIGINAL DOCUMENT: English

Chattopadhyay A., Singla S., Saigal K., Qureshi S., Saikia D.

Distinguishing the overlapping features of severe multi-inflammatory syndrome in children from severe dengue, scrub typhus and other endemic tropical infections—a comparative study from a tertiary care pediatric intensive care unit

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ABSTRACT: Early differentiation between severe multi-inflammatory syndrome in children (MIS-C) and severe presentations of dengue, scrub typhus, and other endemic tropical infections could help clinicians devise appropriate treatment strategies. This study aims to identify the diagnostic markers that may be used to discriminate between MIS-C versus endemic tropical infections, namely dengue and scrub typhus, which frequently occur in endemic areas. A retrospective study was conducted in a pediatric intensive care unit (PICU) of a tertiary care center in New Delhi, India between 2020 and 2023. Comparative analysis of 33 children diagnosed with MIS-C was done versus 77 children with five endemic tropical infections—dengue, scrub typhus, typhoid fever, malaria, and leptospirosis. Rash [63.63% vs. 31.64% (P = 0.005)], conjunctival redness [63.63% vs. 8.86% (P < 0.001)], and altered sensorium [45.45% vs. 22.78% (P = 0.031)] were seen in a greater proportion of MIS-C cases than those with tropical infections. C-reactive protein (CRP) (mg/dl) was significantly higher in children with MIS-C versus those with tropical infections [176.1 (112.61, 198.32) vs. 9.25 (24.05, 69.38), P ≤ 0.001]. Ferritin and lactate dehydrogenase (LDH) were observed to be significantly higher in children with tropical infections compared to those with MIS-C. Using multivariable logistic regression analysis, the odds of having a rash were higher among children with MIS-C than those with dengue [OR = 8.07 (95% CI: 1.22–53.48, P = 0.03)]; followed by altered sensorium [OR = 16.04 (95% CI: 2.06–124.62, P = 0.008)]; myocardial involvement [OR = 7.18 (95% CI: 1.12–45.93, P = 0.037)]; and CRP (>50 mg/dl) [OR = 17.59 (95% CI: 2.69–114.92, P = 0.003)]. The findings of our study suggest that several clinical and laboratory measures could potentially distinguish between patients with severe MIS-C and endemic tropical infections. Clinical markers such as rash, altered sensorium, myocardial involvement, and shock were seen in a greater proportion of cases with MIS-C. Inflammatory markers such as CRP were higher in children with MIS-C, whereas ferritin and LDH were higher in dengue, scrub typhus, typhoid fever, malaria, and leptospirosis.

LANGUAGE OF ORIGINAL DOCUMENT: English

Chen M., Wu H., Xie L., Wu M., Lan P.

Successful management of severe pulmonary form of leptospirosis with VV-ECMO, prone ventilation, and bronchoalveolar lavage: two case reports

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ABSTRACT: Background: Leptospirosis is a globally prevalent zoonotic acute infectious disease that can rapidly progress to severe pulmonary form of leptospirosis (SPFL), leading to multiple organ failure with a high mortality rate. It is estimated that approximately 58,900 deaths occur annually due to leptospirosis, with critically ill patients admitted to intensive care units facing extremely high fatality rates. Therefore, timely and effective treatment strategies are crucial. Case presentation: Two patients developed fever after farm work exposure, followed by progressive dyspnea and hemoptysis, leading to hospitalization. They rapidly developed acute respiratory distress syndrome (ARDS) and diffuse alveolar hemorrhage (DAH) with severe thrombocytopenia, accompanied by a continuous decline in the ratio of the partial pressure of arterial oxygen to the fraction of inspired oxygen (PaO_2/FiO_2 [P/F]). Despite endotracheal intubation and mechanical ventilation, hypoxemia persisted. Venovenous extracorporeal membrane oxygenation (VV-ECMO) was initiated to provide oxygenation support, heparin anticoagulation was not used in the early stage. Meanwhile, prone ventilation and bronchoscopy alveolar lavage were performed to promote the clearance of pulmonary hemorrhage, along with anti-infection treatment. The diagnosis of leptospirosis was confirmed through

Metagenomic Next-Generation Sequencing (mNGS). Both patients ultimately recovered, were successfully weaned from life support, discharged in stable condition, and returned to normal life. Conclusion: Early VV-ECMO support, combined with prone ventilation and bronchoalveolar lavage, can improve the prognosis of patients with SPFL. mNGS testing aids in the definitive diagnosis of leptospirosis and provides a reliable basis for antibiotic selection.
LANGUAGE OF ORIGINAL DOCUMENT: English

Hobbs E.C., McNamara B., Hayman S., Blasdell K., Athan E., O'Brien D.P., Muleme M.
The role of foxes in transmitting zoonotic bacteria to humans: a scoping review
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DOI: 10.1111/zph.13230
ABSTRACT: Zoonotic diseases inflict substantial burdens on human and animal populations worldwide, and many of these infections are bacterial. An Australian study investigating environmental risk factors for Buruli ulcer in humans detected the causative agent, Mycobacterium ulcerans, in the faeces of wild foxes, a novel finding that suggests foxes may be implicated in the transmission of this zoonotic bacterium. The aim of this scoping review was to systematically search and examine the global data for reports implicating foxes in the transmission of zoonotic bacteria to humans. A pre-tested search strategy was implemented in five bibliographic databases (PubMed, Embase, CAB Abstracts, Cochrane Trials, Google Scholar). Eligible studies presented primary research data about zoonotic bacterial diseases that were confirmed or presumed to have been transmitted via foxes (excluding exclusively blood- or vector-borne bacteria), with no restrictions on geographical setting or publication year. The final dataset included ten primary research articles, with varying study designs, settings, populations and testing methods. The described bacterial zoonoses were anthrax, cutaneous diphtheria, leptospirosis, faecal coliforms including E. coli, tularaemia, yersiniosis, and Buruli ulcer (the study that was the impetus for this scoping review). Fox-human bacterial transmission was confirmed in one human case and considered likely to have occurred in certain high-risk groups in another. The likelihood of fox-human transmission having occurred in the remaining studies was possible (n = 5) or unlikely (n = 3). Identified and hypothesised drivers of fox-human transmission included accidental and occupational factors. Published reports of fox-human transmission of zoonotic bacteria are few, and generally indicative of relatively low risk. However, foxes can transmit zoonotic pathogens including bacteria to humans in a variety of settings, and human-fox encounters are likely to increase with ongoing anthropogenic activities. Further research and public education campaigns would help increase knowledge and awareness of fox-associated zoonoses.
LANGUAGE OF ORIGINAL DOCUMENT: English

Handayani F., Widanarti E.T., Kusuma C.W., Ristiyanto R., Soebandrio A., Gasem M.H.
Accuracy of four rapid diagnostic tests (RDTs) for human leptospirosis diagnosis in Indonesia
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DOI: 10.1128/spectrum.01524-24
ABSTRACT: Leptospirosis is an endemic zoonotic disease with protean clinical manifestations caused by pathogenic spirochetes of the Leptospira genus. The microscopic agglutination test (MAT) is the gold standard for leptospirosis diagnosis and can only be conducted in a reference laboratory. Therefore, alternative tests, such as the IgM anti-Leptospira rapid diagnostic test (RDT), are preferred for general use. In this study, we aimed to compare the accuracy of four products of anti-Leptospira IgM detection RDTs, which are available in

Indonesia, against the gold standard of Leptospira MAT. This study was a diagnostic validation test using bioarchived serum from 364 human serum samples tested by MAT from August to September 2020 in Demak, Central Java, Indonesia. The four products were (i) Fokus Leptospira, (ii) Answer Leptospira, (iii) SD Bioline Leptospira IgG/IgM, and (iv) Uji Leptospira IgM, sequentially renamed RDT-1 to RDT-4. Interobserver agreements were analyzed using the kappa value. The diagnostic performance of the four RDTs were compared against MAT results as the gold standard. We also evaluated the combination of two RDTs' performance, which were RDT (1 + 2), RDT (1 + 3), RDT (1 + 4), RDT (2 + 4), and RDT (3 + 4). We found that the kappa coefficients of RDT-1, RDT-2, and RDT-4 were greater than 80%, while RDT-3 had a moderate kappa value of 69.1%. RDT-1, RDT-2, and RDT-4 had moderate to good sensitivities of 78.2%, 74.3%, and 83.6%, respectively, while RDT-3 had the lowest sensitivity at 30.9%. RDT-3 demonstrated the highest specificity. RDT-2 showed the highest predictive value at 75.9%, while RDT-4 showed the highest negative predictive value at 96.9%. In addition, the combination of two RTDs provided better diagnostic performances. The four RDTs performed varied in their ability to diagnose leptospirosis, but only RDT-4 showed a sensitivity of more than 80%. We recommend caution in diagnosing only one RDT result. Testing by other RDTs and confirmation by MAT are strongly recommended.
LANGUAGE OF ORIGINAL DOCUMENT: English

Uribe M., Azócar-Aedo L., Gallardo M.

Serosurveillance of pathogenic Leptospira in ruminants from a veterinary teaching hospital

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ABSTRACT: Leptospirosis can affect livestock health and production, potentially causing abortion, stillbirth, and infertility. An endemic presentation of infection in ruminants most likely occurs in southern Chile. A pilot study was conducted in a veterinary hospital in Puerto Montt to perform epidemiological surveillance to determine the seropositivity of pathogenic Leptospira in different ruminant species using a microscopic agglutination test (panel of eight serogroups) and to identify the most common serogroups and antibody titers in seropositive animals. Serum samples were collected from 43 ruminants (20 cattle, 18 sheep, 4 goats, and 1 alpaca). The overall seropositivity was 69.7% (95% confidence interval (CI) = 56.0–83.4), which is the highest rate reported so far in ruminants in the country. Elevated seropositivity was recorded in cattle (85.0%; 95% CI = 69.3%–100%), followed by sheep (66.7%; 95% CI = 45.0%–87.0%) and goats (25.0%; 95% CI = 0%–67.4%). The predominant serogroups were Tarassovi and Sejroe, followed by Autumnalis and Canicola, with different antibody titers according to the serogroup. It is recommended to consider the implementation of epidemiological surveillance for pathogenic Leptospira in different settings, such as other veterinary hospitals and farms, to elucidate the reproductive and economic consequences that the disease may cause in different ruminant species, and to apply preventive measures due to the zoonotic potential of the bacterium.
LANGUAGE OF ORIGINAL DOCUMENT: English