Istituto Zooprofilattico Sperimentale
della Lombardia e dell'Emilia – Romagna "Bruno Ubertini"
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BOLLETTINO BIBLIOGRAFICO

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Zhang Y., Yin M., Wen H.

VV-ECMO adjuvant therapy for Leptospira complicated with H1N1 infection: a case report

(2024) Frontiers in Medicine, 11, art. no. 1495324

DOI: 10.3389/fmed.2024.1495324

ABSTRACT: Background: Leptospirosis is an acute infectious disease that occurs by infection, progresses rapidly, and has a high mortality rate, with an estimated 1.2 million new cases and nearly 59,000 deaths each year. Due to its diverse clinical manifestations, diagnosis is often delayed. Therefore, it is necessary to pay attention to its clinical manifestations, diagnostic techniques, and treatment methods. Case report: A 51-year-old male patient from the Han ethnic group experienced fever, chills, headache, and overall fatigue after being exposed to rain, followed by yellowing of the skin and worsening of breathing difficulties. Metagenomic next-generation sequencing (mNGS) indicates infection with leptospirosis and influenza A. After 5 days of treatment with venovenous extracorporeal membrane oxygenation (VV-ECMO), Penicillium, and Oseltamivir, the condition improved. Conclusion: Leptospirosis improves with VV-ECMO support and anti-infective treatment with penicillin and oseltamivir. VV-ECMO provides a therapeutic time window for rescue, and mNGS lays a foundation for early detection of etiology of leptospirosis.

LANGUAGE OF ORIGINAL DOCUMENT: English

Melchior L.A.K., da Silva K.R.C., Silva A.E.P., Chiaravalloti-Neto F.

Spatial, temporal, and space-time analysis of leptospirosis cases in Acre, 2001-2022

(2024) Revista brasileira de epidemiologia = Brazilian journal of epidemiology, 27, pp. e240063

DOI: 10.1590/1980-549720240063

ABSTRACT: OBJECTIVE: To identify clusters of high and low risk for the occurrence of leptospirosis in space and space-time in Acre, between 2001 and 2022, as well as to characterize temporal trends and epidemiological profiles of the disease in the state. METHODS: An ecological study of cases mandatorily reported by health services in Brazil. For the analysis of clusters in space and space-time, the SaTScan software was used, which calculated the relative risks (RR). Additionally, temporal trends were obtained using Prais-Winsten linear regression and epidemiological profiles estimated by incidences by sex and age group. RESULTS: A high-risk spatial cluster was identified in Rio Branco, Bujari, and Porto Acre (RR=2.94), occurring mainly between 2013 and 2015, according to the space-time cluster (RR=9.51). The municipality of Cruzeiro do Sul also showed a high-risk spatial cluster (RR=1.31). This municipality and contiguous municipalities showed an increasing temporal trend in cases, while the other municipalities in the state showed a stationary temporal trend. The disease mainly affected men between 20 and 59 years old, followed by young people aged 10 to 19 years. However, the RR of leptospirosis in older women was 2.1 times higher than in older men (95%CI 1.6-2.9). CONCLUSION: The findings indicated that leptospirosis, although endemic in the state, had a more significant incidence in certain municipalities and years. Therefore, it is necessary to act with greater or lesser intensity in specific locations and periods, both for the prevention and control of the disease.

LANGUAGE OF ORIGINAL DOCUMENT: English

Oliveira I.V.P.M., Bezerra J.A.B., Moura G.H.F., Yamakawa A.C., Nilsson M.G., Ferreira J.D.S., Haisi A., Fornazari F., Langoni H., Antunes J.M.A.P.

Molecular analysis of zoonotic pathogens in free-ranging six-banded armadillos (Euphractus sexcinctus) from the Brazilian semiarid region

(2025) Revista brasileira de parasitologia veterinaria = Brazilian journal of veterinary parasitology: Orgao Oficial do Colegio Brasileiro de Parasitologia Veterinaria, 34 (1), pp. e017124
DOI: 10.1590/S1984-29612025002
ABSTRACT: This study investigated infection by Leishmania spp., Leptospira spp., Toxoplasma gondii, and Trypanosoma cruzi in six-banded armadillos (Euphractus sexcinctus) from the semiarid region of northeastern Brazil. Twenty specimens of E. sexcinctus were captured alive by wildlife veterinarians from their natural habitats in different locations. The animals were euthanized following induction of anesthesia, and different biological samples were collected. Infection with four pathogens was subsequently evaluated: Leishmania infection was investigated by spleen and liver Polymerase Chain Reaction (PCR); Leptospira spp. infection was evaluated by kidney PCR and serologically by microscopic agglutination test; T. gondii infection was assessed by PCR of the heart, lung, and spleen; and T. cruzi infection was investigated by heart and whole blood PCR and hemoculture. All tests presented negative results apart from whole blood PCR to detect T. cruzi, which was positive in one of the 20 animals tested and confirmed by genetic sequencing. It is important to highlight that this is the first study comprising a molecular investigation of different zoonotic pathogens in six-banded armadillos, and the findings reported here bring new and important knowledge regarding zoonotic diseases in this species.
LANGUAGE OF ORIGINAL DOCUMENT: English

The Lancet Global Health
Climate change and NTDs: a perfect storm
(2025) The Lancet Global Health, 13 (2), pp. e172
DOI: 10.1016/S2214-109X(25)00014-2
LANGUAGE OF ORIGINAL DOCUMENT: English

Başaran I.
AUTHOR FULL NAMES: Başaran, Ilknur (59534533100)
59534533100
The management of infectious diseases in disasters
(2025) Disaster Management in the Digital Age and Emerging Technologies, pp. 63 - 78
ABSTRACT: Natural disasters result in significant destruction, loss of many lives, and exposure to infectious diseases referred to as a significant threat to those who need to continue their lives. The main disasters seen in Turkiye include earthquakes, floods, storms, fires, droughts, and avalanches. Following these disasters, infectious diseases such as measles, malaria, diarrhea, acute respiratory infections, tetanus, typhoid fever, dengue fever, meningitis, and leptospirosis are observed due to the inability to provide basic needs such as air, water, food, and shelter necessary for human life. Disaster management is one of the most critical processes before and after a disaster in a country. In this context, one of the fundamental tasks of disaster management could be to prevent or reduce loss of life and property damage. Moreover, it should be prepared for possible disasters, take necessary measures to reduce damage, and support the population. Furthermore, it should use technological means effectively and appropriately to inform and educate the people of the country after the disaster. The purpose of this study is the management of infectious diseases following disasters. It is prepared as a qualitative study using a large number of literature reviews. As a result of the literature review, it has been observed that infectious diseases such as measles, malaria, diarrhea, acute respiratory infections,

tetanus, typhoid fever, dengue fever, meningitis, and leptospirosis occur in Turkiye after natural disasters. The importance of disaster management before and after disasters has been understood. Recommendations can include adhering to disaster regulations to prevent disasters and minimize damage, ensuring that individuals and institutions involved in disaster management receive adequate training, possessing the necessary skills to implement measures during disasters, and paying attention to the selection of settlement areas.
LANGUAGE OF ORIGINAL DOCUMENT: English

Krairojananan P., Wasuworawong K., Leepitakrat S., Monkanna T., Wanja E.W., Davidson S.A., Poole-Smith B.K., McCardle P.W., Mann A., Lindroth E.J.

Leptospirosis risk assessment in rodent populations and environmental reservoirs in humanitarian aid settings in Thailand

(2025) Microorganisms, 13 (1), art. no. 29

DOI: 10.3390/microorganisms13010029

ABSTRACT: Leptospirosis, a global zoonotic disease caused by Leptospira spp., presents high morbidity and mortality risks, especially in tropical regions like Thailand. Military personnel deployed in endemic areas, such as during the Cobra Gold Joint exercise, face heightened exposure. This study assessed Leptospira's prevalence in rodents and environmental reservoirs at military training sites from 2017 to 2022. A surveillance program was conducted at Engineering Civil Assistance Program (ENCAP) training sites using real-time PCR, dark-field microscopy, and 16S rRNA gene sequencing to detect Leptospira in rodents and environmental samples. Results showed a 1.3% infection rate in rodents (15 of 1161), while Leptospira was detected in 10.2% of water samples (42 of 413) and 23.1% of soil samples (30 of 130). Diverse Leptospira interrogans strains circulated among rodents, and three groups of naturally circulating Leptospira strains were detected in environmental reservoirs. These findings underscore Leptospira's survival and transmission potential within exercise sites, informing Force Health Protection (FHP) decisions. By integrating pre-exercise data on primary hosts and environmental reservoirs with historical local outbreak records and research on risk factors, this study identifies key areas for public health intervention and potential mitigation strategies.
LANGUAGE OF ORIGINAL DOCUMENT: English

Butkevych M., Chumachenko D.

Time series analysis of leptospirosis incidence for forecasting in the Baltic Countries using the ARIMA model

(2024) Radioelectronic and Computer Systems, 2024 (4(112)), pp. 5 - 19

DOI: 10.32620/reks.2024.4.01

ABSTRACT: Leptospirosis, a zoonotic disease with significant public health implications, presents considerable forecasting challenges due to its seasonal patterns and environmental sensitivity, especially in under-researched regions like the Baltic countries. This study aimed to develop an ARIMA-based forecasting model for predicting leptospirosis incidence across Estonia, Latvia, and Lithuania, where current disease data are limited and variable. This study aims to investigate the epidemic process of leptospirosis, while its subject focuses on applying time series forecasting methodologies suitable for epidemiological contexts. Methods: The ARIMA model was applied to each country to identify temporal patterns and generate short-term morbidity forecasts using confirmed leptospirosis case data from the European Centre for Disease Prevention and Control from 2010 to 2022. Results. The model's performance was assessed using the Mean Absolute Percentage Error (MAPE), revealing that Lithuania had the most accurate forecast, with a MAPE of 6.841. The

accuracy of Estonia and Latvia was moderate, likely reflecting case variability and differing regional epidemiological patterns. These results demonstrate that ARIMA models can effectively capture general trends and provide short-term morbidity predictions, even within diverse epidemiological settings, suggesting ARIMA's utility in low-resource and variable data environments. Conclusions. The scientific novelty of this study lies in its application of ARIMA modelling to leptospiro sis forecasting within the Baltic region, where comprehensive time series studies on the disease are scarce. From a practical perspective, this model offers a valuable tool for public health authorities by supporting targeted interventions, more efficient resource allocation, and timely response planning for leptospirosis and similar zoonotic diseases. The ARIMA model's adaptability and straightforward application across countries demonstrate its potential for informing public health decision-making in settings with limited data on disease patterns. Future research should expand on this model by developing multivariate forecasting approaches incorporating additional factors to refine the model's predictive accuracy. This approach could further improve our un derstanding ofleptospirosis dynamics and enhance intervention strategies.
LANGUAGE OF ORIGINAL DOCUMENT: English

Sánchez-Lerma L., Mattar S., Contreras V., Miranda J., Tique V., Rodríguez V., Rodriguez D., Lopez S., Rojas-Gulloso A.

Hantavirus and Leptospira are important causes of nonspecific acute febrile syndrome, Meta, Colombia

(2025) Travel Medicine and Infectious Disease, 64, art. no. 102800
DOI: 10.1016/j.tmaid.2025.102800
ABSTRACT: Introduction: Acute undifferentiated febrile illnesses are fevers lasting less than fourteen days without an evident focus of infection on the initial physical examination or with inconclusive laboratory tests. Objective: Carry out epidemiological surveillance of the etiology of acute undifferentiated febrile syndrome in the Meta department. Methods: A descriptive, prospective cross-sectional study was carried out between February 2021 and June 2023 in a first-level hospital in the department of Meta, Colombia. All enrolled patients underwent routine hematology and blood biochemistry examinations. RT-qPCR was performed for Dengue and serology for laboratory diagnoses using ELISA and MAT for Hantavirus and Leptospirosis, respectively. A descriptive and bivariate analysis was performed using SPSS vr 23.0. Results: Of the study's total of one hundred patients, 14 % showed antibodies against hantavirus IgG, of which two were seroconverted. In addition, a risk factor OR = 8.3 (CI = 1.8–38.4) for Hantavirus was found in those patients who had contact with farm animals. Regarding leptospirosis, 3 % of the sera agglutinated with titers greater than 1:400, resulting in a primary infection; 11 % of the sera presented agglutination with titers no greater than 1:200 as exposure to leptospirosis. The bivariate analysis showed an OR = 2.4; CI = 0.75–7.4 with water recreational activities in the last 30 days before the onset of symptoms. Conclusions: Our study demonstrates the importance of Hantavirus, Dengue, and leptospirosis as a cause of acute undifferentiated febrile illnesses. Coinfections are frequent in one of the tropical areas of Colombia, so it is crucial to establish a more precise diagnosis.
LANGUAGE OF ORIGINAL DOCUMENT: English

Papadopoulos S., Hardy D., Vernel-Pauillac F., Tichit M., Boneca I.G., Werts C.

Myocarditis and neutrophil-mediated vascular leakage but not cytokine storm associated with fatal murine leptospirosis

(2025) eBioMedicine, 112, art. no. 105571

DOI: 10.1016/j.ebiom.2025.105571

ABSTRACT: Background: Leptospirosis is a globally neglected re-emerging zoonosis affecting all mammals, albeit with variable outcomes. Humans are susceptible to leptospirosis; infection with Leptospira interrogans species can cause severe disease in humans, with multi-organ failure, mainly affecting kidney, lung and liver function, leading to death in 10% of cases. Mice and rats are more resistant to acute disease and can carry leptospires asymptomatically in the kidneys and act as reservoirs, shedding leptospires into the environment. The incidence of leptospirosis is higher in tropical countries, and countries with poor sanitation, where heavy rainfall and flooding favour infection. Diagnosis of leptospirosis is difficult because of the many different serovars and the variety of clinical symptoms that can be confused with viral infections. The physiopathology is poorly understood, and leptospirosis is often regarded as an inflammatory disease, like sepsis. Methods: To investigate the causes of death in lethal leptospirosis, we compared intraperitoneal infection of male and female C57BL6/J mice with 108 Leptospira of two strains of pathogenic L. interrogans. One strain, L. interrogans Manilae L495, killed the mice 4 days after infection, whereas the other strain, L. interrogans Icterohaemorrhagiae Verdun, did not induce any major symptoms in the mice. On day 3 post infection, the mice were humanely euthanised and blood and organs were collected. Bacterial load, biochemical parameters, cytokine production and leucocyte population were assessed by qPCR, ELISA, cytometry and immunohistochemistry. Findings: Neither lung, liver, pancreas or kidney damage nor massive necroptosis or cytokine storm could explain the lethality. Although we did not find pro-inflammatory cytokines, we did find elevated levels of the anti-inflammatory cytokine IL-10 and the chemokine RANTES in the serum and organs of Leptospira-infected mice. In contrast, severe leptospirosis was associated with neutrophilia and vascular permeability, unexpectedly due to neutrophils and not only due to Leptospira infection. Strikingly, the main cause of death was myocarditis, an overlooked complication of human leptospirosis. Interpretation: Despite clinical similarities between bacterial sepsis and leptospirosis, striking differences were observed, in particular a lack of cytokine storm in acute leptospirosis. The fact that IL-10 was increased in infected mice may explain the lack of pro-inflammatory cytokines, emphasising the covert nature of Leptospira infections. Neutrophilia is a hallmark of human leptospirosis. Our findings confirm the ineffective control of infection by neutrophils and highlight their deleterious role in vascular permeability, previously only attributed to the ability of leptospires to damage and cross endothelial junctions. Finally, the identification of death due to myocarditis rather than kidney, liver or liver failure may reflect an overlooked but common symptom associated with poor prognosis in human leptospirosis. These features of neutrophilia and myocarditis are also seen in patients, making this mouse model a paradigm for better understanding human leptospirosis and designing new therapeutic strategies.

LANGUAGE OF ORIGINAL DOCUMENT: English

Govan R., Scherrer R., Fougeron B., Laporte-Magoni C., Thibeaux R., Genthon P., Fournier-Viger P., Goarant C., Selmaoui-Folcher N.

Spatio-temporal risk prediction of leptospirosis: a machine-learning-based approach

(2025) PLoS neglected tropical diseases, 19 (1), pp. e0012755

DOI: 10.1371/journal.pntd.0012755

ABSTRACT: Background: Leptospirosis is a neglected zoonotic disease prevalent worldwide, particularly in tropical regions experiencing frequent rainfall and severe cyclones, which are further aggravated by climate change. This bacterial zoonosis, caused by the Leptospira genus, can be transmitted through contaminated

water and soil. The Pacific islands bear a high burden of leptospirosis, making it crucial to identify key factors influencing its distribution. Understanding these factors is vital for developing targeted policy decisions to mitigate the spread of Leptospira. Methodology/principal findings: This study aims to establish a precise spatio-temporal risk map of leptospirosis at a national scale, using binarized incidence rates as the variable to predict. The spatial analysis was conducted at a finer resolution than the city level, while the temporal analysis was performed on a monthly basis from 2011 to 2022. Our approach utilized a comprehensive strategy combining machine learning models trained on binarized incidences, along with descriptive techniques for identifying key factors. The analysis encompasses a broad spectrum of variables, including meteorological, topographic, and socio-demographic factors. The strategy achieved a concordance metric of 83.29%, indicating a strong ability to predict the presence of contamination risk, with a sensitivity of 83.93%. Key findings included the identification of seasonal patterns, such as the impact of the El Niño Southern Oscillation, and the determination that rainfall and humidity with a one-month lag are significant contributors to Leptospira contamination. Conversely, soil types rich in organic matter may reduce bacterial presence and survival. Conclusions/significance: The study highlights the significant influence of environmental factors on the seasonal spread of Leptospira, particularly in tropical and subtropical regions. These findings are crucial for public health planning, providing insights for targeted policies to reduce leptospirosis, while advanced machine learning models serve as a robust tool for improving disease surveillance, and risk assessment, which ultimately supports the development of an early warning system.
LANGUAGE OF ORIGINAL DOCUMENT: English

Karvelienė B., Stadalienė I., Rudejevienė J., Burbaitė E., Juodžentė D., Masiulis M., Buitkuvienė J., Šakalienė J., Zamokas G.

Prevalence of Leptospira spp. in Lithuanian Wild Boars (Sus scrofa)

(2025) Pathogens, 14 (1), art. no. 85

DOI: 10.3390/pathogens14010085

ABSTRACT: Leptospira is a bacteria responsible for a widespread zoonosis that affects both humans and animals. Leptospirosis is a challenging pathology to diagnose and treat since its signs are unspecific and symptoms vary greatly. The disease seems to be highly prevalent in environments where reservoir animals such as rats and small mammals are common. Even though leptospirosis in humans in Lithuania is rare, it remains a disease of significance in Europe. Information on reservoir animals and prevalence of Leptospira in wild animals in Lithuania is lacking. The aim of this country-wide study was to evaluate the seroprevalence of Leptospira in wild boars in Lithuania. Hunted animals were collected from ten counties that represented the boar population of the country. The sera of 451 collected boars were evaluated for eight Leptospira serovars using the microscopic agglutination test. Seropositivity was observed in 102 (22.6%) boars. Overall, 194 positive reactions occurred. Boars older than 2 years were affected by more serovars and were more seropositive than younger boars ($p < 0.05$). The highest number of positive reactions was observed in Panevėžys (87.9%) and Vilnius (69.1%) counties. The results of this study might indicate that the wild boar is a reservoir animal of Leptospira and plays a role in its transmission in Lithuania.
LANGUAGE OF ORIGINAL DOCUMENT: English

Tshokey T., Ko A.I., Currie B.J., Munoz-Zanzi C., Goarant C., Paris D.H., Dance D.A.B., Limmathurotsakul D., Birnie E., Bertherat E., Gongal G., Benschop J., Savelkoel J., Stenos J., Saraswati K., Robinson M.T., Day N.P.J., Graves S.R., Belmain S.R., Blacksell S.D., Wiersinga W.J.

Leptospirosis, melioidosis, and rickettsioses in the vicious circle of neglect

(2025) PLoS neglected tropical diseases, 19 (1), pp. e0012796

DOI: 10.1371/journal.pntd.0012796

ABSTRACT: The global priorities in the field of infectious diseases are constantly changing. While emerging viral infections have regularly dominated public health attention, which has only intensified after the COVID-19 pandemic, numerous bacterial diseases have previously caused, and continue to cause, significant morbidity and mortality-deserving equal attention. Three potentially life-threatening endemic bacterial diseases (leptospirosis, melioidosis, and rickettsioses) are a huge public health concern especially in low- and middle-income countries. Despite their continued threat, these diseases do not receive proportionate attention from global health organizations and are not even included on the WHO list of neglected tropical diseases (NTDs). This, in turn, has led to a vicious circle of neglect with continued, yet conceivably preventable, hospitalizations and deaths each year especially in the vulnerable population. This is a call from a group of multi-institutional experts on the urgent need to directly address the circle of neglect and raise support in terms of funding, research, surveillance, diagnostics, and therapeutics to alleviate the burden of these 3 diseases.

LANGUAGE OF ORIGINAL DOCUMENT: English

Philippon P.A.

7006319373

Leptospirosis: what's new? [La leptospirose: quoi de neuf?]

(2024) Bulletin de l'Academie Veterinaire de France, 177

DOI: 10.3406/bavf.2024.71075

ABSTRACT: Human leptospirosis has just become in France the 38th notifiable disease (MDO) with its highest prevalence in Europe. This underestimated global zoonosis is a perfect example of the "One Health" paradigm with its three pilars: the environment, animals and humans. They are benefiting from a revival of epidemiological analyses thanks to molecular approaches currently individualizing 68 genomic species, and in particular several virulence factors were discovered, giving rise to various diagnostic perspectives, geographical but also, in the future, vaccines.

LANGUAGE OF ORIGINAL DOCUMENT: French

Alinaitwe L., Wainaina M.K., Dürr S., Kankya C., Kivali V., Bugeza J., Aturinda C.J., Lubega A., Mayer-Scholl A., Hoona J.J., Bahn P., Hammerl J.A., Roesel K., Cook E.A.J., Richter M.H.

Molecular detection and typing of pathogenic Leptospira species from livestock and small mammals in Uganda

(2025) Epidemiology and Infection

DOI: 10.1017/S0950268825000044

ABSTRACT: Leptospira are bacteria that cause leptospirosis in both humans and animals. 22 Human Leptospira infections in Uganda are suspected to arise from animal-human interactions. From a nationwide survey to determine Leptospira prevalence and circulating sequence types in Uganda, we tested 2030 livestock kidney samples, and 117 small mammals (rodents and shrews) using a real-Time PCR targeting the lipL32 gene. Pathogenic Leptospira species were detected in 45 livestock samples but not in the small

mammals. The prevalence was 6.12% in sheep, 4.25% in cattle, 2.08% in goats, and 0.46% in pigs. Sequence typing revealed that L. borgpetersenii, L. kirschneri, and L. interrogans are widespread across Uganda, with 13 novel sequence types identified. These findings enhance the East African MLST database and support the hypothesis that domesticated animals may be a source of human leptospirosis in Uganda, highlighting the need for increased awareness among those in close contact with livestock.
LANGUAGE OF ORIGINAL DOCUMENT: English

Ulok V., Bilung L.M., Guan T.M., Tahar A.S., Ngui R., Apun K.

In-vitro susceptibility of pathogenic and intermediate Leptospira species towards antibiotics and herb extracts

(2024) Tropical Biomedicine, 41 (4), pp. 553 - 558
DOI: 10.47665/tb.41.4.017
ABSTRACT: Leptospirosis is a severe and potentially fatal re-emerging zoonotic and waterborne disease caused by pathogenic and intermediate species of Leptospira. Given the high global rates of morbidity and mortality associated with this disease, there is an urgent need to explore alternative therapeutic agents to enhance treatment options. This study investigates the anti-leptospiral efficacy of several common antibiotics-penicillin G, doxycycline, ampicillin, amoxicillin, cefotaxime, chloramphenicol, and erythromycin, as well as extracts from local herbs, Hydnophytum formicarum Jack and Boesenbergia stenophylla, against pathogenic and intermediate Leptospira strains. A broth microdilution method determined the minimum inhibitory concentration (MIC) for the antibiotics and herb extracts. Both herbs were extracted using four different solvents: ethyl acetate, methanol, hexane, and chloroform. The extracts were then analysed using gas chromatography-mass spectrometry (GC-MS) to identify their phytochemical compounds. The results demonstrated that cefotaxime and erythromycin exhibited the highest anti-leptospiral activity, with MIC values of 0.2 µg/mL. This was followed by amoxicillin and ampicillin (0.2–0.39 µg/mL), penicillin G (0.39–3.13 µg/mL), chloramphenicol (0.78–3.13 µg/mL), and doxycycline (0.78–12.5 µg/mL). H. formicarum Jack and B. stenophylla extract extractions displayed the lowest MICs (62.5 µg/mL) for the ethyl acetate, methanol, and hexane extracts. They contained various phytochemical constituents, including some with anti-leptospiral properties. These findings indicate that different strains of Leptospira respond with varying levels of inhibition to the antibiotics and herb extracts studied. The extracts from H. formicarum Jack and B. stenophylla may have potential as anti-leptospiral drugs. However, further in-vivo studies are needed to better understand their efficacy against Leptospira.
LANGUAGE OF ORIGINAL DOCUMENT: English

Moreno–Andrade L.M., Linárez–Álvarez N., Pedraza–Toscano A.M., Torres–García O.A., Vargas–Ortiz F.J., Blas–Giral I.D.

Estimation of the prevalence of the main reproductive pathologies that affected dairy farming in Colombia reported between 2019 and 2022 through a meta–analysis

(2024) Revista Cientifica de la Facultad de Veterinaria, 34 (3), art. no. rcfcv-e34489
DOI: 10.52973/RCFCV-E34489
ABSTRACT: Reproductive pathologies in dairy cattle significantly impact animal welfare, profitability, and productivity. The objective of this study was to estimate the prevalence of the main reproductive pathologies that have affected livestock farming in Colombia during the period between 2019 and 2022 through a

systematic review and meta–analysis. A meta–analysis was carried out where the prevalence of diseases was identified, where initially a systematic review was accomplish with the PRISMA methodology, using the databases PubMed, Science Direct, Dialnet, Google Scholar. Inclusion and exclusion criteria were defined, the quality of the studies was evaluated and data was extracted from the selected articles to analyze the information using the OpenMeta [Analyst]® software, in order to standardize the findings obtained. From an initial 3, 883 bibliographic references, 28 studies met the inclusion criteria. Infectious Bovine Rhinotracheitis (IBR) exhibited the highest prevalence, ranging from 0.00% to 77.30%, followed by Bovine Neosporosis (17.55% – 61.34%) and Bovine Viral Diarrhea (BVD) (16.14% – 44.13%). Brucellosis (0.01% – 1.65%) and Leptospirosis (1.48% – 24.33%) displayed the lowest overall prevalence. Data for other reproductive diseases was either absent or excluded based on the defined criteria. The identified prevalence of reproductive diseases in Colombian dairy cattle highlights the need for improved farm health protocols and management practices. Furthermore, a scarcity of studies across different regions suggests a gap in knowledge regarding the true national prevalence of these diseases. This knowledge is crucial for establishing effective health and animal welfare plans.
LANGUAGE OF ORIGINAL DOCUMENT: English

Tiwari S., Khatib M.N., Mm R., Kaur M., Sharma G.C., Sudan P., Naidu K.S., Singh R., Vishwakarma T., Puri S., Shabil M., Yadav A., Singh T., Khurana S., Mehta R., Satapathy P., Sah R., Gaidhane A.M., Bushi G.
Prevalence of dengue and leptospirosis coinfection and associated mortality rates: a systematic review and meta-analysis
(2025) BMC infectious diseases, 25 (1), pp. 111
DOI: 10.1186/s12879-025-10498-1
ABSTRACT: BACKGROUND: Dengue and leptospirosis are prominent vector-borne diseases in tropical and subtropical regions, sharing overlapping geographic distribution and clinical presentations, which complicates diagnosis and management. Co-infection of these pathogens places additional strain on healthcare resources in endemic areas. This study aims to systematically estimate the prevalence and mortality rates of dengue and leptospirosis co-infections and assess their clinical implications. METHODS: Adhering the PRISMA 2020 guidelines and registered in the PROSPERO database, we conducted a systematic review and meta-analysis using the PubMed, Embase, and Web of Science databases up to October 2024. Nested Knowledge was used for screening and data extraction. Studies reporting quantitative data on the prevalence or mortality of dengue and leptospirosis co-infections were included. Data extraction and quality assessment were performed independently by two reviewers using the Modified Newcastle-Ottawa Scale. Statistical analyses, including prevalence and mortality estimation, sensitivity analysis were conducted using R, with heterogeneity evaluated by the I^2 statistic. RESULTS: Out of 3,982 records, 14 studies met the eligibility criteria, yielding a pooled prevalence of dengue and leptospirosis co-infection at 2.33% (95% CI: 1.41-3.46%) across 16,638 participants, with significant heterogeneity (I^2 = 90%). The prediction interval for co-infection ranged from 0.05 to 7.27%. The pooled mortality rate among co-infected patients was 9.96% (95% CI: 0-53.49%), with moderate heterogeneity (I^2 = 71%). The prediction interval for mortality ranged from 0.00 to 100%. Publication bias was indicated by an LFK index of 2.52. CONCLUSION: This meta-analysis revealed a moderate prevalence and a notable mortality rate for dengue and leptospirosis co-infections, with significant variability observed across different studies. Further research into the immunopathology and the implementation of integrated surveillance

systems could enhance the effectiveness of diagnosis and treatment strategies in regions where these diseases are endemic.
LANGUAGE OF ORIGINAL DOCUMENT: English

Kesetyaningsih T.W., Suryani L., Sulistyo B.
Correlation between rainfall and the incident of leptospirosis in Bantul Regency, Yogyakarta, Indonesia
(2024) BIO Web of Conferences, 144, art. no. 03003
DOI: 10.1051/bioconf/202414403003
ABSTRACT: Leptospirosis is an infectious disease, with the urine of mice and other carrier animals as the main source of infection, transmitted through direct contact with urine or water contaminated with the carrier's urine.In Indonesia, Bantul Regency has the highest cases of leptospirosis in the Special Region of Yogyakarta Province.This study analyzed the correlation between rainfall and the incidence of leptospirosis in Bantul Regency.An analytical observational method with a cross-sectional design was utilized.The relation between the rainfall variable per district from 2010 to 2023 and the incidence of leptospirosis was assessed using Spearman's rank correlation.The results unveiled that leptospirosis fluctuated in all districts (42 to 168 cases per year), with an average annual rainfall falling between 136 to 237 mm.The geographical distribution revealed that leptospirosis occurred more frequently in urban areas, and Spearman's rank correlation proved that leptospirosis is correlated positively with rainfall ($p = 0.009$; $r = 0.372$).These results indicate that rainfall could serve as a predictor in a prediction model for the incidence of leptospirosis in Bantul Regency.Leptospirosis control has been focused more on urban areas; hence, vigilance needs to be carried out and encouraged during the rainy season.
LANGUAGE OF ORIGINAL DOCUMENT: English

Duque-Arias S., Delgado I.L.J., Taborda D.A.A.
Histopathological description in Rattus norvegicus's kindneys seropositives to Leptospira spp. [Descripción de alteraciones histopatológicas en riñones de Rattus norvegicus seropositivos a Leptospira spp.]
(2024) Revista de Investigaciones Veterinarias del Peru, 35 (4), art. no. e25319
DOI: 10.15381/rivep.v35i4.25319
ABSTRACT: The aim of this study was to describe the most common histopathological findings observed by Hematoxylin-Eosin staining in kidneys of Rattus norvegicus naturally infected and seropositive to Leptospira spp using the Microscopic Agglutination Test (MAT) technique. In total, 165 rodents were captured from three locations in Antioquia (Turbo and Medellín). Kidney samples were taken from the seropositive rodents by MAT and Hematoxylin-Eosin staining was used to evaluate the microscopic lesions and Warthin-Starry to visualize the bacteria. The most frequent morphological diagnoses were chronic interstitial nephritis (45.0%), followed by vascular congestion (20.1%) and chronic interstitial pyelonephritis (10.6%). The pathological processes were classified 73.1% as moderate and 26.9% as mild. The agent was not observed with the Warthin starry stain.
LANGUAGE OF ORIGINAL DOCUMENT: Spanish

Yi S.-H., Xun D., Lei Q.-L., Yang C.-C., Shao J.-W.

Epidemiology and genetic diversity of pathogenic Leptospira among Rattus norvegicus in urban residential areas of Guangzhou, Southern China

(2025) Comparative Immunology, Microbiology and Infectious Diseases, 118, art. no. 102322

DOI: 10.1016/j.cimid.2025.102322

ABSTRACT: Leptospirosis, a zoonotic disease caused by pathogenic Leptospira spirochetes, poses a significant global public health threat. Rodents, particularly those inhabiting urban environments, are recognized as the primary reservoirs for human infections. Therefore, conducting epidemiological studies on pathogenic Leptospira in urban rodent populations is essential for evaluating the risk of human leptospirosis. In this study, we captured 263 Rattus norvegicus from urban residential areas across five districts in Guangzhou to access the prevalence and genetic diversity of pathogenic Leptospira. Our findings revealed the presence of two pathogenic Leptospira species, L. interrogans and L. borgpetersenii, which are the primary pathogens responsible for human leptospirosis in China, in four of the five districts, with an overall prevalence of 10.3 %. Given the close proximity of R. norvegicus to human populations in urban areas, this significant prevalence of pathogenic Leptospira indicates an elevated risk of leptospirosis outbreaks among residents of Guangzhou. These results highlight the urgent need for ongoing monitoring of pathogenic Leptospira infections in urban rodent populations to prevent and control potential outbreaks of leptospirosis in the city.

LANGUAGE OF ORIGINAL DOCUMENT: English

Tandirerung J.B.N., Japanto E.T., Anisa A.H.A., Supit H.R.

From a sudden flood to a silent gut: a rare case report of paralytic ileus and pulmonary hemorrhage due to leptospirosis

(2024) Romanian Journal of Infectious Diseases, 27 (4), pp. 348 - 356

DOI: 10.37897/RJID.2024.4.11

ABSTRACT: Leptospirosis is a zoonotic disease that can cause serious complications such as a pulmonary hemorrhage and paralytic ileus. A 49-year-old man presented with symptoms of fever, myalgia, nausea, vomiting, and diarrhea after exposure to floods in Gorontalo, Indonesia. The diagnosis of leptospirosis was made based on Modified Faine's Criteria, thrombocytopenia, leukopenia, eosinophilia, impaired liver function, and positive RDT results for Leptospira IgM. On the fifth day of treatment, the patient’s condition deteriorated, presenting as shortness of breath and acute abdominal pain. Chest x-ray and BNO 3 position examination suggest pulmonary hemorrhage and paralytic ileus. The patient’s condition improved following the administration of Ceftriaxone and multidisciplinary management, including nasogastric decompression and oxygenation. This case emphasizes the importance of monitoring and early treatment of serious complications of leptospirosis.

LANGUAGE OF ORIGINAL DOCUMENT: English

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

Investigating animals and environments in contact with leptospirosis patients in Aotearoa New Zealand reveals complex exposure pathways

(2025) New Zealand Veterinary Journal

DOI: 10.1080/00480169.2025.2459639

ABSTRACT: Case history: Three human leptospirosis cases from a case-control study were recruited for in-contact animal and environment sampling and Leptospira testing between October 2020 and December 2021. These cases were selected because of regular exposure to livestock, pets, and/or wildlife, and sampling was carried out on their farms or lifestyle blocks (sites A–C), with veterinarians overseeing the process for livestock, and cases collecting environmental and wildlife samples. Laboratory findings: Across the three sites, a total of 137 cattle, > 40 sheep, 28 possums, six dogs, six rats, three pigs and three rabbits were tested. Herd serology results on Site A, a dairy farm, showed infection with Tarassovi and Pomona; urinary shedding showed Leptospira borgpetersenii str. Pacifica. Animals were vaccinated against Hardjo, Pomona and Copenhageni. The farmer was diagnosed with Ballum. On Site B, a beef and sheep farm, serology showed infection with Pomona; animals were not vaccinated, and the farmer was diagnosed with Hardjo. On Site C, cattle were shedding L. borgpetersenii; animals were not vaccinated, and the case's serovar was indeterminate. Six wild animals associated with Sites A and C and one environmental sample from Site A were positive for pathogenic Leptospira by PCR. Conclusion: These findings highlight the complexity of potential exposures and the difficulty in identifying infection sources for human cases. This reinforces the need for multiple preventive measures such as animal vaccination, the use of personal protective equipment, pest control, and general awareness of leptospirosis to reduce infection risk in agricultural settings. Clinical relevance: Farms with unvaccinated livestock had Leptospira infections, highlighting the importance of animal vaccination. Infections amongst stock that were vaccinated emphasise the importance of best practice vaccination recommendations and pest control.
LANGUAGE OF ORIGINAL DOCUMENT: English

Sethi G., Kim Y.K., Han S.-C., Hwang J.H.

Designing a broad-spectrum multi-epitope subunit vaccine against leptospirosis using immunoinformatics and structural approaches

(2024) Frontiers in Immunology, 15, art. no. 1503853

DOI: 10.3389/fimmu.2024.1503853

ABSTRACT: Introduction: Leptospirosis, caused by Leptospira interrogans, is a neglected zoonotic disease that poses a significant global health risk to both humans and animals. The rise of antimicrobial resistance and the inefficacy of existing vaccines highlight the urgent need for new preventive strategies. Methods: An immunoinformatics approach was employed to design a multi-epitope subunit vaccine (MESV) against leptospirosis. B-cell, cytotoxic T lymphocyte (CTL), and helper T lymphocyte (HTL) epitopes were selected from five key Leptospira proteins. These epitopes were fused with a heparin-binding hemagglutinin (HBHA) adjuvant and appropriate linkers to construct the broad-spectrum vaccine. The physicochemical properties of the vaccine were assessed, including antigenicity, immunogenicity, allergenicity, and conservation. The vaccine's 3D structure was modeled, optimized, and validated. Molecular docking, molecular dynamics simulations, and MM-GBSA analysis were performed to assess the vaccine's binding interactions with Toll-like receptors (TLR2 and TLR4). Immune simulations and in silico cloning were also conducted to evaluate the vaccine's immune response and expression potential. Results: The MESV demonstrated high antigenicity, immunogenicity, non-allergenicity, and conservation across different Leptospira strains. Population coverage analysis revealed that T-cell epitopes significantly interacted with HLA molecules, covering 95.7% of the global population. Molecular docking showed strong and stable binding with TLR2 and TLR4, with binding energies of -1,357.1 kJ/mol and -1,163.7 kJ/mol, respectively. Molecular dynamics simulations and MM-GBSA analysis

confirmed the stability of these interactions and accurately calculated the intermolecular binding free energies. Immune simulations indicated robust B and T cell responses, and in silico cloning demonstrated that the vaccine could be successfully expressed in E. coli. Discussion: These findings suggest that MESV is a promising candidate for leptospirosis prevention, providing robust immune responses and broad population coverage. However, further in vivo studies are necessary to validate its efficacy and safety.
LANGUAGE OF ORIGINAL DOCUMENT: English

Nunes D.O., Fehlberg H.F., Carneiro L.O., Oliveira K.M.M., Bovendorp R.S., Ribeiro C.M., Albuquerque G.R., Oliveira T.M.F.D.S., Sevá A.D.P.

Synanthropic rodents as bioindicator of human pathogens in a tourist area of Brazil

(2025) EcoHealth

DOI: 10.1007/s10393-024-01697-4

ABSTRACT: The black rat Rattus rattus is an exotic and synanthropic rodent prominent in Brazil and with high adaptation to urban areas. The species have an omnivorous diet feed on human food resources, potentially becoming infected and spreading infectious agents that cause zoonoses such as leptospirosis, leishmaniosis, Chagas disease, and toxoplasmosis, which are significant public health concerns in the country. We analyzed the epidemiologic profile of R. rattus infected with these agents using molecular diagnostics in the Olivença district, known for its tourism potential, in Ilhéus, Bahia, Brazil. Of 140 animals, the prevalence rates were 30.0% (42) for Leptospira spp., 3.57% (5) for Leishmania spp., and 0.71% (1) for both Trypanosoma cruzi and Toxoplasma gondii. One animal was co-infected with Leptospira interrogans and T. gondii and another with Leptospira spp. and L. (L.) infantum. The high prevalence of Leptospira spp.-infected animals suggests rodents may be a significant infection source for local hosts, as L. interrogans is most common in rodents and humans. Rodents likely become infected through ingestion or contact with contaminated water bodies or food, particularly for Leptospira spp. and T. gondii. It is worth noting that the studied area has beach, high foot traffic, and popular tourist restaurants, which implies the presence of food waste and litter in the environment. This study found synanthropic rodents infected with significant zoonotic agents, indicating their presence in the environment. These agents may not impact the rodent population but can cause serious diseases in humans and other domestic and wild animal species.
LANGUAGE OF ORIGINAL DOCUMENT: English

Bharati J., Baldino M.C., Upadhyay A.

A Young Man With an Unusual Pulmonary-Renal Syndrome: A Quiz

(2025) American Journal of Kidney Diseases, 85 (3), pp. A16 - A18

DOI: 10.1053/j.ajkd.2024.08.009

LANGUAGE OF ORIGINAL DOCUMENT: English

Udechukwu C.C., Kudi C.A., Abdu P.A., Mamman P.H., Pilau N.N., Abiayi E.A., Amaje J., Okoronkwo M.O., Adekola A.A.

Isolation and molecular characterization of pathogenic Leptospira spp. from brown rats (Rattus norvegicus) in Zaria and environs, Kaduna, Nigeria, 2022

(2025) Journal of Wildlife Diseases, 61 (1), pp. 166 - 172

DOI: 10.7589/JWD-D-23-00159

ABSTRACT: Leptospirosis caused by the pathogenic serovars of Leptospira spp. is a zoonotic disease of global importance. Brown rats (Rattus norvegicus), due to their worldwide distribution and reservoir host status, are considered the most important reservoir for environmental leptospiral persistence and infections in animals. We aimed to isolate, identify, and characterize Leptospira spp. circulating among brown rat populations in Zaria, Kaduna state, Nigeria. Kidney samples from 305 brown rats from different locations in Zaria were collected April–June 2022 and cultured using bacteriologic methods. We also extracted DNA from 24 kidney tissue samples for molecular detection of pathogenic Leptospira spp. and for phylogenetic analysis. Leptospira spp. was detected in 57.7% of the samples by using culture methods and in 91.7% of the samples by using PCR. The phylogenetic tree revealed two distinct clusters among the reference sequences, aligning with the known P1 and P2 subclades. The sequences from this study all clustered together on the phylogenetic tree and were most similar to Leptospira interrogans serovar Pomona strain RZ 11. The high prevalence of Leptospira spp. detected in Zaria suggests that further surveillance and assessment of the public risk are warranted.
LANGUAGE OF ORIGINAL DOCUMENT: English

Karakullukcu S., Dilaver I., Colak H.E., Topbas M.

Evaluation of leptospirosis cases in Türkiye using a geographic information system

(2025) Southeast Asian Journal of Tropical Medicine and Public Health, 56 (1), pp. 75 - 89

ABSTRACT: Leptospirosis is a public health problem in Türkiye with cases occurring sporadically and occasionally in outbreaks. In this study we aimed to retrospectively map leptospirosis cases in Rize Province, Türkiye during 2016-2022 using a geographic information system (GIS) in order to inform leptospirosis control efforts. Data regarding numbers and locations of leptospirosis cases in the study province were obtained from an Infectious Disease Surveillance and Early Warning System and entered into GIS software and examined for spatial patterns. A total of 97 subjects were included in the study, 59% males. The mean (±standard deviation) age of study subjects was 59 (±11) years. During the study period, the year with the largest number of leptospirosis cases was 2018 (n = 37) ($p<0.001$) and the month of the year during the study period with the most cases was September (n = 32) ($p<0.001$). The incidence of cases was highest during June-October (n = 85) ($p<0.001$). The districts in Rize Province where the most leptospirosis cases occurred were the 3 contiguous coastal districts of Merkez (n = 31), Çayeli (n = 16) and Pazar (n = 12) ($p<0.001$). Cases were also reported in Güneysu District (n = 11) ($p<0.001$). The other cases of leptospirosis were distributed sporadically. In summary, leptospirosis cases in Rize Province occurred primarily in clusters in 3 contiguous provinces during the study period and were more common during 2018 and during September. We conclude these patterns need to be taken into consideration by efforts to reduce the incidence of leptospirosis in the study area. Further studies are needed to determine why there are more cases in these specific districts during September and if they have preventable origins in order to improve leptospirosis control efforts in Rize Province, Türkiye.
LANGUAGE OF ORIGINAL DOCUMENT: English

Aydemir E.A., Özdemir Demirdelen A.B., Günal Ö., Taşkin M.H., Türe E., Kiliç S.S.

An endemic disease in the Black Sea region: leptospirosis [Karadeniz Bölgesinde Endemik Bir Hastalık: Leptospiroz]

(2025) Mikrobiyoloji bulteni, 59 (1), pp. 102 - 110

DOI: 10.5578/mb.202501106
LANGUAGE OF ORIGINAL DOCUMENT: Turkish

Antoniolli A., Guis H., Picardeau M., Goarant C., Flamand C.

One health field approach applied to leptospirosis: a systematic review and meta-analysis across humans, animals and the environment

(2025) Open Forum Infectious Diseases, 12 (1), art. no. ofae757
DOI: 10.1093/ofid/ofae757

ABSTRACT: Background: Leptospirosis is a neglected zoonosis transmitted through urine of infected hosts or contaminated environments. The transmission of bacteria between humans, animals, and the environment underscores the necessity of a One Health approach. Methods: We conducted a systematic review to identify significant findings and challenges in One Health research on leptospirosis, focusing on studies involving sampling in ≥2 of the 3 compartments: human, animal, and environment. We searched in PubMed, Web of Science, Medline, Scopus, and ScienceDirect from 1 January 1918 to 31 December 2022. We assessed risk of bias in studies using Joanna Briggs Institute tools and performed a meta-analysis to identify links between One Health compartments. Results: Of 1082 leptospirosis studies with sampling, 102 multicompartmental studies conducted between 1972 and 2022 were included: 70 human-Animal, 18 animal-environment, 4 human-environment, and 10 across all compartments. Various methodological weaknesses were identified, from study design to statistical analysis. Meta-regressions identified positive associations between human and animal seroprevalences, particularly with livestock and with wild nonrodent animals, and a link between the environmental positivity rate and domestic animal seroprevalence. Our analysis was constrained by the limited number of studies included and by the quality of protocols. Conclusions: This 50-year overview of One Health field approach to leptospirosis highlights the critical need for more robust, well-supported One Health research to clarify the transmission dynamics and identify risk factors of zoonoses.

LANGUAGE OF ORIGINAL DOCUMENT: English

Govekar S., Puri O., Bhatia M.

Scrub typhus-leptospirosis co-infection in India: a systematic review and meta-analysis

(2025) Transactions of the Royal Society of Tropical Medicine and Hygiene, 119 (2), pp. 97 - 106
DOI: 10.1093/trstmh/trae081

ABSTRACT: Scrub typhus and leptospirosis are re-emerging zoonotic infections with significant morbidity and mortality rates in India. Overlapping aetiological and epidemiological patterns indicate a high possibility of their co-infection in India, which can be a diagnostic challenge due to non-specific clinical features. A systematic search of the PubMed/MEDLINE, Scopus and Embase databases was conducted to identify relevant studies published through 31 August 2023. Studies reporting co-infection of scrub typhus and leptospirosis among the Indian population were included. Data extraction, quality assessment and statistical analysis were performed in accordance with established guidelines. Six studies met the inclusion criteria, comprising a total of 58 co-infection cases. Pooled prevalence of scrub typhus-leptospirosis co-infection among acute undifferentiated febrile illness patients was 3.7% (95% confidence interval [CI] 0.00 to 0.126). Among scrub typhus patients, the prevalence of co-infection with leptospirosis was 13.7% (95% CI 0.027 to 0.304). Significant heterogeneity was observed among the included studies, highlighting the need for cautious interpretation of prevalence estimates. This meta-analysis underscores the clinical importance of scrub typhus-leptospirosis co-infection in

India and emphasizes the need for enhanced clinical awareness, improved diagnostic strategies and targeted research efforts to address this emerging infectious disease threat.
LANGUAGE OF ORIGINAL DOCUMENT: English

Muñoz-Zanzi C., Dreyfus A., Limothai U., Foley W., Srisawat N., Picardeau M., Haake D.A.
Leptospirosis - Improving Healthcare Outcomes for a Neglected Tropical Disease
(2025) Open Forum Infectious Diseases, 12 (2), art. no. ofaf035
DOI: 10.1093/ofid/ofaf035
ABSTRACT: Leptospirosis is a globally distributed zoonotic disease transmitted from animal reservoirs to humans. It is particularly common in tropical regions of Africa, Asia, and Central and South America during heavy rainfall when bacterial spirochetes are released from soil into areas of flooding. Despite causing >1 million severe cases, 58 900 deaths, and 2.9 million disability-adjusted life-years annually - exceeding established neglected tropical diseases - leptospirosis remains underrecognized as a neglected tropical disease. It affects occupational groups like farmers due to high prevalence in livestock and is spread by rodents in urban settings that have poor sanitation and infrastructure. Although effectively treated with inexpensive antibiotics, neglect of leptospirosis research and development has led to a lack of awareness and unavailability of preventive and diagnostic approaches. This review covers the geographic prevalence, disproportionate impacts on marginalized communities, and opportunities for improving social, economic, and healthcare burdens for patients with leptospirosis.
LANGUAGE OF ORIGINAL DOCUMENT: English

Pedrosa J., Mendes J., Zambrano J., Carvalho-Costa F.A., Di Azevedo M.I.N., Aymée L., Lilenbaum W.
How is bovine genital leptospirosis diagnosed under field conditions?
(2025) Animals, 15 (3), art. no. 443
DOI: 10.3390/ani15030443
ABSTRACT: Bovine genital leptospirosis (BGL) is a chronic reproductive disease in cattle, often causing significant economic losses, and is commonly associated with leptospiral strains belonging to the Sejroe serogroup. A two-step protocol was recommended, based on serological screening of the herds followed by an individual diagnosis with PCR of a genital sample. Although proposed, it has not been commonly applied under field conditions, leading to frustrating outcomes in disease control. In that context, the present study aimed to demonstrate the viability of that two-step protocol under field conditions for diagnosing BGL in eight herds with reproductive disorders. Blood samples were collected from 440 cows for serology. In addition, 304 cervicovaginal mucus (CVM) samples were collected for lipL32-PCR and 11 samples were sequenced of the secY gene. All herds showed high seroreactivity, mainly against the serogroup Sejroe. In addition, 113 of the 304 CVM samples (37.2%) were PCR-positive. DNA sequencing of 11 positive samples based on the secY gene revealed maximum identity (100%) with L. interrogans species. This study found CVM sampling quick and easy, making it practical for field use. Overall, the results support the two-step protocol serological screening followed by CVM-PCR testing as an efficient and reliable method for diagnosing BGL in herds with reproductive disorders in field conditions.
LANGUAGE OF ORIGINAL DOCUMENT: English

Shah P.A.D., Stefani W., Putri D.I., Halim S., Abidah S., Muhammad A.

Herbal medicine and leptospirosis in Southeast Asia: a comprehensive bibliometric analysis (1973-2023)

(2025) BIO Web of Conferences, 154, art. no. 04001

DOI: 10.1051/bioconf/202515404001

ABSTRACT: This study provides a bibliometric analysis of research on herbal medicine and leptospirosis in Southeast Asia from 1973 to 2023. The investigation identified 3,043 documents through a systematic search in the Scopus database using keyords. One hundred forty-seven papers were published across 100 different sources, revealing an annual growth rate of 6.07%, indicating a growing interest in the intersection of herbal medicine and leptospirosis. The study shows significant collaboration, with 935 authors contributing to the body of research and an average of 7.55 coauthors per document. Notably, 40.14% of the publications involve international co-authorship, reflecting the global relevance and collaborative efforts in addressing leptospirosis through herbal remedies. Keyword analysis highlights "leptospirosis," "leptospira," and "DNA extraction" as central themes, demonstrating a focus on the genetic and diagnostic aspects of the disease alongside the exploration of plant-based treatments. The research also emphasizes the role of preclinical studies and the chemical analysis of herbal remedies for leptospirosis. The study identifies key contributors to the field, with prolific authors such as Chee HY, Sekawi Z, and Patarakul K leading the research efforts. Malaysia, Thailand, and Japan are highlighted as the most productive countries, significantly contributing to this domain's research output and citation impact.

LANGUAGE OF ORIGINAL DOCUMENT: English

Jadhav A., Sawesi S., Rashrash B.

Bias and Generalizability Challenges in Machine Learning Models for Leptospirosis

(2024) Proceedings - 2024 IEEE International Conference on Big Data, BigData 2024, pp. 4989 - 4995

DOI: 10.1109/BigData62323.2024.10825588

ABSTRACT: This paper highlights the presence of bias in machine learning (ML) and deep learning (DL) models used in leptospirosis research. Of the 17 studies reviewed, only four showed low analysis bias, while the remaining 13 had issues such as data imbalance, small sample sizes, and geographic bias. These biases negatively affect model performance and limit generalizability. We explore the sources of these biases - such as feature selection, dataset composition, and model design - and discuss their impact on predictive accuracy. Finally, we propose strategies to reduce these biases, aiming to improve the fairness, reliability, and performance of ML/DL models in leptospirosis prediction and diagnosis.

LANGUAGE OF ORIGINAL DOCUMENT: English

Fernandes L.G.V., Nascimento A.L.T.O., Nally J.E.

Induced protein expression in Leptospira spp. and its application to CRISPR/Cas9 mutant generation

(2025) Scientific Reports, 15 (1), art. no. 4334

DOI: 10.1038/s41598-025-88633-w

ABSTRACT: Expanding the genetic toolkit for Leptospira spp. is a crucial step toward advancing our understanding of the biology and virulence of these atypical bacteria. Pathogenic Leptospira are responsible for over 1 million human leptospirosis cases annually and significantly impact domestic animals. Bovine leptospirosis causes substantial financial losses due to abortion, stillbirths, and suboptimal reproductive performance. The advent of the CRISPR/Cas9 system has marked a turning point in genetic manipulation,

with applications across multiple Leptospira species. However, incorporating controlled protein expression into existing genetic tools could further expand their utility. We developed and demonstrated the functionality of IPTG-inducible heterologous protein expression in Leptospira spp. This system was applied for regulated expression of dead Cas9 (dCas9) to generate knockdown mutants, and Cas9 to produce knockout mutants by inducing double-strand breaks (DSB) into desired targets. IPTG-induced dCas9 expression enabled validation of essential genes and non-coding RNAs. Additionally, IPTG-controlled Cas9 expression combined with a constitutive non-homologous end-joining (NHEJ) system allowed for successful recovery of knockout mutants, even in the absence of IPTG. These newly controlled protein expression systems will advance studies on the basic biology and virulence of Leptospira, as well as facilitate knockout mutant generation for improved veterinary vaccines.
LANGUAGE OF ORIGINAL DOCUMENT: English

Cahyaningtyas C., Muslich L.T., Madjid B., Sultan A.R., Hamid F., Hatta M.

Factors associated with Leptospira serodiagnosis in febrile patients at public Health Centers in Makassar, Indonesia: a cross-sectional study

(2024) Pan African Medical Journal , 49, art. no. 113
DOI: 10.11604/pamj.2024.49.113.45645
ABSTRACT: Introduction: leptospirosis is a globally prevalent zoonotic disease that can lead to outbreaks with significant public health implications. In Indonesia, particularly in East Java Province and South Sulawesi, reported cases of leptospirosis have been increasing. Diagnosis typically relies on the Leptospira rapid test and ELISA. This study aimed to assess the association between high-risk populations and Leptospira infection. Methods: this cross-sectional observational study included febrile patients hospitalized at Public Health Centers in Makassar City. Blood samples were collected from eligible participants and tested using both the IgM ELISA and Standard Q Leptospira IgM/IgG rapid test. Results: of the 78 participants, 51% were female, and 64% lived in high-risk areas. The Standard Q Leptospira IgM/IgG test identified 1.3% as positive, while the IgM ELISA detected 2.6% positive cases. The two diagnostic methods showed strong concordance (88.7%). No significant differences were found between infection rates and factors such as age, gender, occupation, or lifestyle. Conclusion: the incidence of leptospirosis in Makassar was low. There was good agreement between the rapid test and ELISA tests. No significant association was observed between Leptospira infection and variables such as age, gender, occupation, or lifestyle.
LANGUAGE OF ORIGINAL DOCUMENT: English