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Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia – Romagna "Bruno Ubertini"
Reparto Tecnologie Biologiche Applicate – Laboratorio Batteriologia Specializzata
Email: mario.dincau@izsler.it, crn.leptospirosi@izsler.it
Telefoni: 030 2290268, 030 2290323

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Borges A.L.D.S.B., Aymée L., Roussouliéres I., Carvalho-Costa F.A., Di Azevedo M.I.N., Lilenbaum W.

First isolation of Leptospira interrogans from follicular fluid of naturally infected cows

(2025) Veterinary Microbiology, 305, art. no. 110522

DOI: 10.1016/j.vetmic.2025.110522

ABSTRACT: The presence of leptospires in the follicular fluid has only been confirmed through molecular techniques, as culturing leptospires is extremely challenging. The lack of studies demonstrating the viability of leptospires in this site limits a deeper understanding of pathogenesis. Therefore, this study aimed to cultivate and molecularly characterize Leptospira spp. from follicular fluid and uterine tissue samples collected from naturally infected cows. A total of 85 cows from herds with leptospirosis were selected and 53 follicular fluids (FF) and 85 uterine fragments (UF) were collected after slaughter. The samples were seeded into T80/40LH, and evaluated by Darkfield Microscopy (DFM). Positive cultures were tested by lipL32-PCR to confirm the presence of pathogenic Leptospira spp. Positive tubes were submitted to serogrouping and genotyping by sequencing of the secY gene. A maximum likelihood (ML) tree was constructed. A total of 33/85 (39 %) cows were positive, 16/53 (30.2%) only in FF, 14/85 (16.4 %) only in UF, and three in both samples. It was possible to obtain one isolate from FF, serogrouped as Icterohaemorrhagiae. Six samples were sequenced by secY. All of them were identified as L. interrogans, with > 99 % identity. The ML tree revealed that all sequences belong to a group with strains close to serovar Hardjo. Herein, we highlight the presence of live L. interrogans in follicular fluid, emphasizing it as an important site of infection, as leptospires could impair embryo production. The similarity of the strains involved to highly virulent strains in humans raises concerns, posing a potential zoonotic risk.

LANGUAGE OF ORIGINAL DOCUMENT: English

Obels I., Mughini-Gras L., Maas M., Brandwagt D., van den Berge N., Notermans D.W., Franz E., van Elzakker E., Pijnacker R.

Increased incidence of human leptospirosis and the effect of temperature and precipitation, the Netherlands, 2005 to 2023

(2025) Eurosurveillance, 30 (15), art. no. 2400611

DOI: 10.2807/1560-7917.ES.2025.30.15.2400611

ABSTRACT: Background: The incidence of leptospirosis, a zoonotic infection transmitted mainly by rodents, has increased in humans over the past decade in the Netherlands. Previous studies, mostly from countries with tropical climates, suggest that temperature and rainfall influence leptospirosis incidence. Aim: We aimed to identify factors that could explain the increasing leptospirosis incidence in the Netherlands, including temperature and precipitation. Merthods: Epidemiological data of leptospirosis cases notified from 2005 to 2023 to the national surveillance system were analysed to identify changes over the years. Negative binomial regression models were used to assess associations between weather variables and leptospirosis incidence. Results: From 2005 to 2023, 1,164 cases were notified. The annual number of cases increased 2.7-fold in the period of 2019–2023 compared with 2005–2009, and the number of autochthonous cases 4.1-fold. Data from 1,158 cases were included in the analyses, and 596 (51.5%) of these cases were autochthonous. Most cases were male (n = 927; 80.1%), needed hospital treatment (n = 861; 74.4%) and acquired the infection through contact with surface water and/or soil (n = 611, 72.6%). Higher mean winter (incidence rate ratio (IRR) = 1.27; 95% confidence interval (CI): 1.18–1.36) and summer (IRR = 1.38; 95% CI: 1.18–1.61) temperatures were significantly associated with increased leptospirosis incidence. Conclusion: Leptospirosis incidence has

increased over the past decades and may continue to increase due to climate change. Prevention should aim at advising the appropriate preventive measures to avoid exposure to Leptospira and increasing awareness about leptospirosis among clinicians to allow for timely diagnosis and treatment.
LANGUAGE OF ORIGINAL DOCUMENT: English

Regassa A.G., Obsu L.L., Melese A.S.

Optimal control of leptospirosis dynamics in cattle herds with cost-effectiveness analysis

(2025) Modeling Earth Systems and Environment, 11 (3), art. no. 210
DOI: 10.1007/s40808-025-02380-5

ABSTRACT: Leptospirosis is a zoonotic disease caused by infectious bacteria in the genus Leptospira. The disease is a common public health and veterinary problem worldwide due to the impaired reproductive ability of the affected cattle. This study builds on our previous work on the leptospirosis transmission for cattle and turns it into a non-autonomous problem to investigate the optimal control measures and resolve the health and economic losses. It does this by looking at the costs and benefits of three time-dependent actions: prevention, vaccination, and treatment. The characterization of optimality systems was analytically studied using Pontryagin's minimum principle. For various control strategies, numerical simulations of the optimality system were run using the GEKKO dynamic optimization suite in the Python program. The results, both with and without controls, were graphically shown. According to the numerical results, a combination of prevention, vaccination, and treatment measures could significantly reduce the risk of leptospirosis outbreaks in cattle herds more than the application of a single control measure. In addition, a cost-effectiveness analysis was conducted to identify the most cost-effective approach utilizing incremental and average cost-effectiveness ratios. Accordingly, we found that when resources are scarce, the vaccination-only approach is the most economical way to control the spread of leptospirosis.
LANGUAGE OF ORIGINAL DOCUMENT: English

Andityas M., Sota P., Sukon P., Tangkawattana P., Sripa B., Ngasaman R., Tangkawattana S.

Co-occurrence of leptospirosis and Opisthorchis viverrini infection in cats and their risk factors

(2025) Research in Veterinary Science, 190, art. no. 105657
DOI: 10.1016/j.rvsc.2025.105657

ABSTRACT: Leptospirosis is a waterborne disease with a worldwide distribution. In Northeast Thailand, its prevalence overlaps with the endemicity of Opisthorchis viverrini, (OV). This study aimed to investigate the prevalence and risk factors of leptospirosis in cats and its association with opisthorchiasis in endemic area of Thailand. 115 cats were sampled for blood and feces. We tested Leptospira antibodies in blood using the Lepto-latex test. For fecal analysis, we applied the formalin-ether concentration technique (FECT) for OV and identified Leptospira spp. through PCR targeting the 16S rRNA and LipL32. Non-spatial analyses included Pearson's Chi-square, Fisher's exact test, and logistic regression, while spatial analyses involved Inverse Distance Weighted (IDW), spatial autocorrelation, and Geographically Weighted Logistic Regression (GWLR). Serological analysis revealed 15.65 % of cats positive for Leptospira spp., whereas 44.35 % of fecal samples positive for OV. PCR analysis identified 1 L. interrogans with the 16S rRNA, while the LipL32 identified 2 samples related to L. interrogans and 1 to L. borgpetersenii. The spatial autocorrelation indicated clustering of leptospirosis cases. Logistic regression revealed 2 significant risk factors; OV infection (OR 3.44, 95 % CI 1.10–10.73; p 0.03) and proximity to flooded areas (OR 3.47, 95 % CI 1.12–10.74; p 0.03). Furthermore,

GWLR showed median coefficients of 0.59 (−1.62–5.15) for OV infection and 2.15 (1.30–6.47) for proximity to flooded areas. This study demonstrates a significant association between cat leptospirosis with OV infection and proximity to flooded areas. These highlight the importance of monitoring environmental and biological risk factors to mitigate leptospirosis in endemic regions.
LANGUAGE OF ORIGINAL DOCUMENT: English

Loebel P., Azócar-Aedo L., Rodríguez A., Gallardo M.

Relationship between Microscopic Agglutination Test and Real-Time PCR Assay for Detection of Seropositivity of Pathogenic Leptospira Infections in Cattle in Chile: A Pilot Study

(2025) Zoonoses (Ireland), 5 (1), art. no. 17
DOI: 10.15212/ZOONOSES-2025-0003

ABSTRACT: Objectives: This study was aimed at evaluating the relationship between microscopic agglutination test (MAT) seropositivity and real-time polymerase chain reaction (PCR) reactivity in cattle. An additional objective was assessment of the diagnostic value of both tests in detecting seropositivity and infection caused by pathogenic Leptospira. Methods: Blood and urine samples were collected from 61 bovines in the Los Lagos region of Chile. The MAT detected a panel of eight Leptospira serogroups, whereas real-time PCR was conducted with a TaqMan probe targeting the Leptospira lipL32 gene. Results: The seropositivity rate for pathogenic Leptospira was 39.3% (95% confidence interval [95% CI], 27.04–51.57) according to the MAT, and Tarassovi and Sejroe were the most frequently detected serogroups. The antibody titers ranged from 1:200 to 1:800. The positivity rate determined with real-time PCR was 29.5% (95% CI, 18.05–40.94), and the leptospiral concentrations ranged from 1.07 to 12,500 leptospires per milliliter urine. Among the 24 animals with MAT-reactive serum samples, 18 also had urine samples with positive real-time PCR results; thus 75% of animals had positive results with both techniques. The kappa coefficient between tests of 0.784 (95% CI, 0.539–1.0) indicated substantial agreement. The sensitivity and specificity of real-time PCR versus MAT were 75.0% (95% CI, 57.7–92.3) and 100%, respectively. The positive and negative predictive values were 100% and 86.7% (95% CI, 75.7–96.4), respectively. Conclusion: The results demonstrated the complementary nature of MAT and real-time PCR analyses in diagnosing bovine leptospirosis: combined use of both tests enhanced diagnostic accuracy. Real-time PCR detected Leptospira infection and bacterial renal excretion, thus providing insights into the presence and extent of environmental contamination, whereas the MAT identified seropositivity, antibody titers, and the serogroups associated with infection.
LANGUAGE OF ORIGINAL DOCUMENT: English

Rivera A., Zambrano-Mila M.S., Orlando S.A., Jiménez Valenzuela F., Sanchez E., Calderon J., González M., Rodriguez-Pazmiño A.S., Marzal A., Molineros E., Garcia-Bereguiain M.A.

A first insight into the occurrence of Leptospira, Brucella and Coxiella burnetii infections in wild mammals rescued from illegal trade in Ecuador: a proxy for one health conservation policies

(2025) One Health, 20, art. no. 101045
DOI: 10.1016/j.onehlt.2025.101045

ABSTRACT: Illegal wildlife trade is a major concern not only for conservation and animal welfare but also for public health. Human interaction with wild animals increases the risk of zoonotic disease transmission, while exposure of wildlife to humans and domestic animals poses additional threats to biodiversity through the spread of infectious diseases. This issue is particularly critical in tropical, biodiversity-rich countries like

Ecuador, often low- and middle-income nations where resources for conservation are limited. In the absence of official data on illegal wildlife trafficking in Ecuador, several non-profit organizations work in collaboration with the Ministry of the Environment to combat this trade and rehabilitate rescued animals, with the ultimate goal of returning them to their natural habitats. In this study, we addressed for the first time in Ecuador the occurrence of three endemic zoonotic pathogens that cause reproductive problems (Leptospira spp., Brucella spp., and Coxiella burnetii) in wild mammals. A total number of 28 individuals from 15 different species, including primates and felines, were included. All the animals tested positive for antibodies against Leptospira spp., and a great diversity of antibodies against pathogenic serovars was found. Moreover, 7.4 % CI: (2.0 %–22.6 %) and 3.7 % CI: (0.6 %–17.7 %) of the animals tested were positive for antibodies against C. burnetii and Brucella spp., respectively. Our results show that wild mammals are a reservoir for leptospirosis in Ecuador. Also, there is a risk of transmission of C. burnetii and Brucella spp. from domestic animals to wildlife and vice versa, associated with anthropogenic activities like farming, as those pathogens have a high prevalence in cattle and dogs in Ecuador. In conclusion, wildlife illegal traffic represents a threat to conservation, animal welfare, and public health issues that need to be managed with One Health-inspired policies, like educational programs warning about the risk of wildlife possession for humans and domestic animals.
LANGUAGE OF ORIGINAL DOCUMENT: English

Lea J.S.X., Reduan M.F.H., Choong S.S., Kamaruzaman I.N.A., Ooi P.T., AbuBakar S., Loong S.K., Rahman M.S.A.

Leptospirosis in humans and animals in Malaysia: A review from 1976 to 2023

(2025) Veterinary World, 18 (3), pp. 673 - 685

DOI: 10.14202/vetworld.2025.673-685

ABSTRACT: Leptospirosis is a globally distributed zoonotic disease that remains under-reported and misdiagnosed, particularly in tropical regions such as Malaysia. This review provides a comprehensive analysis of leptospirosis cases in humans and animals in Malaysia from 1976 to 2023, examining trends in prevalence, outbreak patterns, diagnostic advancements, and associated risk factors. The disease is primarily transmitted through direct contact with infected animals or indirectly via contaminated water and soil, with rodents serving as a major reservoir. In Malaysia, leptospirosis prevalence has increased in recent years, with a notable correlation between outbreaks and occupational exposure, recreational water activities, and monsoon-related flooding. Surveillance data indicate that specific populations, including agricultural workers, town service employees, and animal handlers, are at elevated risk. Furthermore, the disease is commonly misdiagnosed due to its clinical similarities with other endemic febrile illnesses, such as dengue fever and malaria. Advances in diagnostic methodologies, particularly the increasing use of molecular techniques such as polymerase chain reaction (PCR), have enhanced early detection, although serological tests remain widely used in epidemiological studies. This review underscores the necessity of a One Health approach, integrating human, animal, and environmental health strategies to improve surveillance and control measures. Future research should focus on strengthening diagnostic capabilities, understanding environmental reservoirs, and implementing targeted public health interventions to mitigate leptospirosis transmission in Malaysia.
LANGUAGE OF ORIGINAL DOCUMENT: English

Azevedo B.O.P., Damiano D.K., Teixeira A.F., Nascimento A.L.T.O., Fernandes L.G.V., Lopes A.P.Y.

The VapBC-4 characterization indicates it is a bona fide toxin-antitoxin module of Leptospira interrogans: initial evidence for a role in bacterial adaptation

(2025) Microorganisms, 13 (4), art. no. 879

DOI: 10.3390/microorganisms13040879

ABSTRACT: Toxin-antitoxin (TA) systems are one of the bacterial adaptation mechanisms to adverse conditions. Leptospira interrogans serovar Copenhageni contains nine putative TA systems. To date, only VapBC-3 and VapBC-1 have been experimentally characterized and considered functional modules. This study shows that the VapBC-4 module is a novel bona fide TA system constituted by VapB-4 antitoxin and VapC-4 toxin. Overexpression of the recombinant toxin in Escherichia coli resulted in growth inhibition, which was rescued by co-expression of the VapB-4 antitoxin. The toxin-antitoxin binding capability, essential to TA functionality, was demonstrated by dot blot assay in vitro, while the pull-down assay indicates that the toxin and antitoxin interact in vivo. In addition, we confirmed that VapC-4 is a PIN domain endoribonuclease capable of degrading viral MS2 substrate. The transcriptional studies suggest that vapC-4 may be involved in the virulence and adaptability of L. interrogans serovar Copenhageni for adverse environmental conditions. Taken together, these results show that the VapBC-4 module is functional and can be considered a bona fide module.

LANGUAGE OF ORIGINAL DOCUMENT: English

Chávez-Sánchez J.F., Galaviz-Silva L., Molina-Garza Z.J., Zapata-Benavides P., Cedillo-Rosales S., Elizondo-Luévano J.H., Kačániová M., Ávalos-Ramírez R.

Risk factors associated with the seroprevalence of leptospirosis in small ruminants from a semi-arid region of Mexico

(2025) Pathogens, 14 (4), art. no. 344

DOI: 10.3390/pathogens14040344

ABSTRACT: Leptospirosis is one of the world's major neglected tropical zoonotic diseases (NTZDs), implicated in animal health and welfare with economic consequences for livestock production. This study aims to estimate the seroprevalence of Leptospira spp. and identify potential risk factors in small ruminant herds. This epidemiological cross-sectional study was conducted in Nuevo León, a semi-arid region of Mexico. A total of 389 blood samples from goats and 385 from sheep older than eight months were randomly collected from 128 herds. Anti-Leptospira antibodies were detected using the microscopic agglutination test (MAT), and univariate and multivariate logistic regression analyses were performed to determine their association with leptospirosis infection. The overall prevalence was 13.5% (105/774), with 14.4% (56/389) in goats and 12.7% (49/385) in sheep. Sejroe was the most predominant serogroup. The main risk factors in sheep were contact with domestic cattle, ≥100 animals per herd, congenital abnormalities, contact with feral pigs, meat production system, absence of veterinary care, and abortions with odds ratios (OR) between 1.7 and 4.1. In goats, the main risk factors included lack of quarantine measures, contact with feral pigs, absence of veterinary care, and abortions where the OR ranged from 1.7 to 3.3. These findings indicate that Leptospira spp. is present in small ruminant herds. This is the first study aimed at understanding leptospirosis epidemiology in the northeastern region of Mexico, as goats and sheep may act as potential reservoirs. Continuous monitoring of Leptospira infections is imperative, as well as developing educational initiatives for farmers to implement biosecurity and prevention measures to prevent infections within herds and protect public health.

LANGUAGE OF ORIGINAL DOCUMENT: English

Marotto L.S., Marotto M.S., Barrese T.Z., Borges C.S.C., Guerra J.M., de Araújo L.J.T., Ferreira C.S.S., Filho A.N., Marotto P.C.F.

Leptospirosis and coinfections leading to fatal multiple organ and system failure

(2025) Revista do Instituto de Medicina Tropical de Sao Paulo, 67, art. no. e26

DOI: 10.1590/S1678-9946202567026

ABSTRACT: Coinfection with leptospirosis and other infectious agents pose major challenges in medical practice, often due to difficulties in isolating these agents, symptoms overlap, and lack of specific investigation protocols in areas with emerging and re-emerging diseases. Consequently, knowledge regarding these coinfections and their impact on clinical outcomes are limited. A previously healthy 33-year-old woman, with no history of chronic or malignance diseases, was admitted with febrile icteric illness, pulmonary hemorrhage, acute kidney injury, thrombocytopenia, and shock. Leptospirosis, COVID-19, human rhinovirus, and dengue in the acute phase were clinically and pathologically diagnosed. Multiple coinfections can rapidly lead to multiple organ and system failure, often resulting in a fatal outcome.

LANGUAGE OF ORIGINAL DOCUMENT: English

Ranieri T.M., Viegas da Silva E., Vallandro M.J., Oliveira M.M.D., Barcellos R.B., Lenhardt R.V., Timm L.N., Campos A.S., Simoni C., Abbad P.R.D.S., Brack D.B., Rech T.F., Silveira J.D.O., Estevam V.O., Fonseca L.X., Galan D.I., Schneider M.C.

Leptospirosis cases during the 2024 catastrophic flood in Rio Grande Do Sul, Brazil

(2025) Pathogens, 14 (4), art. no. 393

DOI: 10.3390/pathogens14040393

ABSTRACT: Leptospirosis is a well-known disease that frequently occurs after floods. At the beginning of May 2024, a catastrophic flood occurred in the state of Rio Grande do Sul, Brazil, affecting two million people and leading to a state of calamity. Given the State’s high pre-flood leptospirosis rates, the disease became a major concern for decision-makers. This study aimed to estimate the rise in leptospirosis cases after the flood, assess the changes in case patterns before and after the disaster, and document the response of the state health surveillance center to the outbreak. We estimated the increase during the flood period (May to July 2024) by comparing it with the same period in the previous year as baseline. During the first three months of the catastrophic event, 6273 suspected cases of leptospirosis were reported to the surveillance system, and 958 cases were confirmed. The number of confirmed cases during the flood was 10.3-fold higher than the baseline. Spearman’s rank-order correlation coefficient was 0.77 (p-value < 0.0001) for the association of Health Regions regarding the rank in incidence rates of confirmed cases in the flood period and the proportion of the population with households flooded. Thirty deaths (three females) were confirmed, a 6.0-fold rise compared with 2023. The state responders carried out many activities, including epidemiological surveillance and the dissemination of information. Among the challenges faced was the lack of evidence in the literature supporting recommendations for antibiotic chemoprophylaxis for rescue personnel. Another difficulty concerned performing gold-standard laboratory diagnostic tests to confirm the enormous number of suspected cases reported during this catastrophe. Despite implementing many actions to mitigate its impact, leptospirosis remained a major challenge during the event. These findings may provide valuable insights for decision-makers facing similar situations in massive climate disasters.

LANGUAGE OF ORIGINAL DOCUMENT: English

Kiuno K., Nishizato M., Hu W., Mitsunaga S., Shigenaga C., Shinohara M., Nochide K., Murakami T., Kakita T., Takabe K., Koyabu D., Takano A., Koizumi N., Shimoda H., Hayasaka D.

Genetic diversity of pathogenic Leptospira spp. harbored by bats in Japan

(2025) Microbial Pathogenesis, 205, art. no. 107565

DOI: 10.1016/j.micpath.2025.107565

ABSTRACT: Leptospirosis is a zoonotic infectious disease caused by pathogenic Leptospira species. In Japan, human and canine leptospirosis cases are reported annually. Although wild animals, including bats, are known to harbor pathogenic Leptospira spp., infection of bats in this region has never been explored. This study aimed to determine the presence of leptospires and their genetic diversity in five Japanese bat species. Kidney tissue and blood samples were collected from 115 bats captured in the Yamaguchi Prefecture and Hokkaido, Japan. Pathogenic Leptospira spp. were detected in the kidneys by real-time PCR and conventional PCR using primers targeting lipL32 and rrs2. Multilocus sequence typing (MLST) and sequencing of secY gene were performed on PCR-positive DNA samples. Leptospira spp. were detected in 26 of the 115 bats (22.6 %), including Rhinolophus ferrumequinum (5/37, 14 %), Rhinolophus cornutus (2/6, 33 %), Miniopterus schreibersii (6/37, 16 %), Myotis macrodactylus (11/15, 73 %), and Vespertilio sinensis (2/20, 10 %). Phylogenetic analysis based on MLST genes and secY gene revealed detected genes clustered with either L. interrogans, L. borgpetersenii, or L. kirschneri and a relationship between the leptospires identified in the bats in this study and bats in other countries or other host, and PCR with L. borgpetersenii-specific primers revealed co-infection with multiple Leptospira species in individual bats. Our study demonstrated a high carriage rate, genetic diversity of Leptospira spp., and co-infection with multiple Leptospira spp. in Japanese bats.

LANGUAGE OF ORIGINAL DOCUMENT: English

Alizadeh S., Jamshidi S., Abdollapour G., Moosavian H., Akbarein H., Yousefsani Z.S.

Prevalence of leptospirosis in stray cats with and without renal failure in iran: serologic study and urinary molecular evaluation

(2025) Journal of Veterinary Research, 80 (1), pp. 35 - 42

DOI: 10.22059/jvr.2023.362636.3367

ABSTRACT: BACKGROUND: Leptospirosis is a common disease between humans and animals with a global spread. Serological prevalence of leptospirosis in cats has been reported to be 4.8-35 %, depending on geographical location and different diagnostic methods. OBJECTIVES: This study aims to assess the seropositivity and urinary polymerase chain reaction (PCR) status of Leptospira spp. in cats with and without renal failure in Iran. METHODS: Whole blood and urine samples were obtained from 64 stray cats. Anti-Leptospira antibodies were detected in the sera using a microscopic agglutination test (MAT). DNA was extracted from the urine of each cat, and direct detection of Leptospira spp was performed in the urine by PCR method. Based on the whole blood count, serum biochemistry profile, and urinalysis, the cats were classified into healthy (without renal failure) and patient group (with acute or chronic renal failure). RESULTS: Of 64 cats, 12 tested positive for serum titer, and 10 cats tested positive for urine contamination in molecular evaluation. Therefore, the prevalence of leptospirosis infection was reported as 18.75 % and 15.62 % based on MAT and molecular test, respectively. The most common serovars detected serologically were Canicola (n=6) and Ballum (n=4). Seropositivity for Leptospira spp. was statistically different between groups: 12.5% (7.56) and 62.5% (5.8) in the healthy and patient groups, respectively (P =0.05). Statistical analysis of the data showed that infection with Leptospira spp. in cats is a risk factor for the development of renal failure (OR: 11.66; 95

%CI: 2.72-56.89; P<0.05). CONCLUSIONS: The prevalence of Leptospira spp. in stray cats in Iran is considerable, which should be considered from a public health perspective and as a potential factor for the development of renal failure.
LANGUAGE OF ORIGINAL DOCUMENT: Persian

Aleman M.A.R., Gaeta N.C., Castro V., Marques E.C., Ribeiro B.L.M., Olímpio Z.S., Gregory L.
Clinical and epidemiological study of leptospirosis in the settlements of Presidente Epitacio and Mirante do Paranapanema
(2025) Microorganisms, 13 (4), art. no. 865
DOI: 10.3390/microorganisms13040865
ABSTRACT: Brazilian family farming comprises production units that represent approximately 86.40% of agricultural establishments, playing a significant national role in socio-environmental and economic sectors. The state of São Paulo is known for its rural and urban development, including agricultural settlements such as Pontal do Paranapanema. This sector requires attention due to the emergence of infectious diseases, such as leptospirosis, a widespread zoonotic disease that causes losses in agricultural productivity. This study aimed to analyze the prevalence of leptospirosis in dairy cattle within the settlements of Presidente Epitácio and Mirante do Paranapanema. All animals underwent serological testing. The overall prevalence of Leptospira spp. was 58.93%. Additionally, the prevalence of antibodies against Leptospira spp. was 59.20% in multiparous cows and 58.60% in primiparous cows. A correlation was also observed between animals with retained placenta and seropositive animals for Leptospira spp. antibodies. Based on this study, we highlight that the high prevalence of leptospirosis underscores the presence of this pathology in settlements within the Pontal do Paranapanema region. Consequently, there is a need to develop public policy programs, alongside sanitary and control measures, to mitigate the impact on dairy farming in the region.
LANGUAGE OF ORIGINAL DOCUMENT: English

Pricemou S., Soropogui B., Bérété F., Beavogui M.B., Samoura A., Picardeau M., Bourhy P., Tordo N., Grayo S.
Diversity of Leptospira species and their rodent reservoirs in the Guinean forest
(2025) Microorganisms, 13 (4), art. no. 833
DOI: 10.3390/microorganisms13040833
ABSTRACT: Leptospirosis is a bacterial zoonosis caused by pathogenic species from the genus Leptospira. Infection mostly occurs through indirect contact with environmental water contaminated with the urine of reservoir animals. Information on the circulation of leptospirosis in West Africa, as well as its potential reservoir hosts, is limited. Therefore, we carried out trapping surveys in the Guinean forest in November 2022, and samples were collected from 42 micromammals. The animals were both morphologically and genetically identified. The lungs and kidneys were screened for Leptospira using Lfb1-gene-targeting real-time PCR, and positive samples were genotyped based on the polymorphic Lfb1 gene. Leptospira species were detected in the kidneys of three micromammals: Mastomys natalensis, Lophuromys sikapusi, and Rattus rattus. Leptospira borgpetersenii was identified in Rattus rattus and Mastomys natalensis that were captured in two different villages. The phylogenetic analysis indicated that this subspecies had previously been detected in one patient in Mayotte, but the reservoir was not identified. A new subspecies of Leptospira kirschneri was isolated in Lophuromys sikapusi from the same village as the Mastomys natalensis positive for L. borgpetersenii. The

high diversity of both the reservoirs and Leptospira species in the Guinean forest indicates that we should study other natural regions and reinforce communities' awareness of Leptospira infection risks in Guinea.
LANGUAGE OF ORIGINAL DOCUMENT: English

Costa A.C.T.R.B., Ferreira A.C.R., Costa D.A.C., Colocho R.A.B.E., Lopes J., de Souza K.C., Alvez S.M.R., de Pinho G.Z., da Silva Y.D., de Brito G.F., Ferreira B.A.M., Oliveira E.A., Chaves M.G.D., de Melo S.N., Souza A.B.B., Pereira C.R., Hirsch C., Rodrigues R.O., Heinemann M.B., Lage A.P., Sanchez J., Dorneles E.M.S.

Prospective study of leptospirosis and brucellosis in dogs from a public shelter in the municipality of Lavras, Minas Gerais State, Brazil

(2025) Ciencia Rural, 55 (7), art. no. e20230552
DOI: 10.1590/0103-8478cr20230552

ABSTRACT: The aim of this study was to assess the prevalence and incidence of canine leptospirosis and brucellosis in Parque Francisco de Assis, a shelter in Lavras, Minas Gerais State, Brazil, as well as the risk factors potentially associated with both diseases. Samples of blood, urine, and sera from all animals were collected in 2019 (n = 329) and 2020 (n = 325 dogs). DNA of Leptospira spp. (urine) and Brucella spp. (urine and blood) were searched by PCR, whereas microagglutination test (MAT) and agar gel immunodiffusion assay (AGID) were performed to identify antibodies anti-Leptospira spp. and anti-rough Brucella spp., respectively. The results showed no positive dogs in PCR for Leptospira spp.; however, a seroincidence of 9.24% was found considering MAT results, with Canicola and Autumnalis being the most common serogroups. The incidence of Brucella spp. PCR-positive animals in the 6 months was 5.62% in the urine and 11.23% in the blood samples, while AGID showed a seroincidence of 11.74% in the period. Overall, our results demonstrated the circulation of Leptospira spp. and Brucella spp. among the dogs from Parque Francisco de Assis, Lavras, Minas Gerais, Brazil, being the weight increase (1.10, 95%CI 1.00-1.21) and neutropenia (3.29, 95%CI 1.60-6.77), the risk factors associated with the occurrence of leptospirosis and brucellosis, respectively. Therefore, brucellosis was identified in the dogs of Parque Francisco de Assis, and the presence of antibodies against Leptospira spp. suggesting contact of the dogs with the pathogen, which represent a risk for the other animals and to the humans in close contact with the positive dogs.
LANGUAGE OF ORIGINAL DOCUMENT: English

Abdullah M., Kadivella M., Sharma R., Baig M.S., Faisal S.M., Azam S.

Identification of virulence genes and clade-specific markers through pan-genomic analysis of Leptospira

(2025) BMC Microbiology, 25 (1), art. no. 248
DOI: 10.1186/s12866-025-03795-x

ABSTRACT: Leptospirosis is an emerging zoonotic and neglected disease across the world causing huge loss of life and economy. In this study, we did whole genome sequencing of one Leptospira isolate and a comparative genomic analysis with 69 other species of Leptospira available in RefSeq database provided insight into taxonomic and evolutionary relationship between species. AAI and whole genome based phylogenomic analysis established 3 clusters of Leptospira i.e. pathogenic, intermediate and saprophytic correlating with level of virulence of species. Leptospira has large closed core genome of 1038 genes and an open pan genome with 20,822 genes. The mobilome related genes were found mainly in pan-genome of pathogenic clade. A total of 498 genes have been identified as virulomes, with 329 virulent genes exhibiting

presence/absence in various Leptospira species contributing to each species specific virulence profile. The hierarchical clustering of the congregated pathogenic genes yielded five groups, each with a distinct pattern of predominant genes that were either unique or common among clades, indicating lineage uniqueness. Most of the virulent gene pool identified were significantly enriched in COG functional categories of Nucleotide transport and metabolism, Intracellular trafficking, secretion and vesicular transport, cell motility and amino acid transport & metabolism. Pathogenic leptospires exhibit fewer clade-specific genes than non-pathogenic and intermediate leptospires, indicating gene loss and gain events in the evolution of pathogenic leptospires from non-pathogenic. The study's clade-specific and virulent genes can be utilised as markers for defining clade and associated virulence levels in any new Leptospira isolates. Wet-lab validation of virulent genes will help in accurately targeting pathogenic pathways of Leptospira and controlling leptospirosis.
LANGUAGE OF ORIGINAL DOCUMENT: English

Michelon W., Santos L.D., Santin L.C., Viancelli A.
Increased leptospirosis incidence following flooding in Rio Grande do Sul, Brazil
(2025) International Journal of Environmental Health Research
DOI: 10.1080/09603123.2025.2498623
ABSTRACT: This study investigates the impact of flood events on leptospirosis incidence and mortality in Rio Grande do Sul State, Brazil. The study compared monthly data from 2007 to April 2024 (before flood) with data from 67 days following the flood event in May 2024. Data indicate significant fluctuations in confirmed cases and deaths across the years, with a notable increase in leptospirosis cases and mortality rates following the 2024 flood events. These findings suggest that floods potentiate the spread of leptospirosis due to contaminated water sources. The most affected demographic was the 20–59 age group, highlighting the need for targeted interventions. Establishment of emergency medical services, implementing robust disease prevention measures, and enhancing healthcare and sanitation infrastructure are necessary to mitigate the health impacts of future floods. This study emphasizes the importance of comprehensive disaster preparedness and response strategies to safeguard public health against increasingly frequent extreme climate events.
LANGUAGE OF ORIGINAL DOCUMENT: English

Ebani V.V., Bongi P., Trebino C., Bertelloni F., Cagnoli G., Bigliazzi B., Del Frate M., Apollonio M., Mancianti F.
The presence of bacterial and protozoan pathogens in wild fallow deer (Dama dama) from a protected area in Central Italy
(2025) Biology, 14 (4), art. no. 342
DOI: 10.3390/biology14040342
ABSTRACT: Wild ruminants often harbor pathogens transmissible to other animals and humans, but their epidemiological role is not always defined for all microorganisms. In this survey, spleens, kidneys, and hearts sampled from 162 fallow deer (Dama dama) were subjected to molecular analyses to detect bacterial (Anaplasma phagocytophilum, Borrelia burgdorferi s.l., Brucella spp., Chlamydia abortus, Coxiella burnetii, Francisella tularensis, Leptospira spp.) and protozoan (piroplasms, Neospora caninum, Toxoplasma gondii) pathogens. Five (3.08%) spleens were positive for A. phagocytophilum, and twelve (7.40%) spleens were positive for Theileria cervi. The remaining pathogens investigated were not detected, and no coinfections were found. The analyzed animals do not seem to have a relevant role in the spreading of these pathogens;

however, monitoring is pivotal to understand the epidemiological scenarios and take appropriate preventive measures in areas frequently visited by people.
LANGUAGE OF ORIGINAL DOCUMENT: English

Kumar K.V., Bokade P.P., Pal A., Sowjanyakumari S., Bharath V., Shome B.R., Balamurugan V.

Detection of anti-leptospiral antibodies in the serum of animals using recombinant Leptospira GroEL-based latex agglutination test

(2025) Microbial Pathogenesis, 205, art. no. 107658
DOI: 10.1016/j.micpath.2025.107658

ABSTRACT: Leptospirosis is a global zoonosis with significant implications for public and animal health. Effective diagnosis and timely intervention are crucial for preventing severe complications and managing chronic carriage of pathogenic Leptospira infection in animals. The heat shock protein GroEL of Leptospira has been identified as a promising candidate due to its ability to elicit high antibody responses and provide long-lasting immunity in both acute and chronic phases of infection. This study explores the diagnostic potential of recombinant GroEL (rGroEL) protein in a Latex Agglutination Test (LAT) for detecting anti-leptospiral antibodies in the sera of animals. The groEL coding gene, devoid of its signal peptide, was amplified from pathogenic Leptospira interrogans serovar Hardjprajitno, cloned into a pETite vector, and expressed in Escherichia coli. Characterisation of the expressed rGroEL protein was carried out by SDS-PAGE and Western blot, which confirmed its specific molecular weight of ~60 kDa protein. Ni-NTA purified rGroEL protein was used to adsorb latex beads, for preparing the sensitized beads which were then assessed as diagnostic antigen in LAT (rGroEL-LAT). Evaluation against the Microscopic Agglutination Test (MAT) revealed a relative diagnostic sensitivity (DSn) of 95.69 % and specificity (DSp) of 93.13 % with an accuracy of 94.33 % for detecting anti-leptospiral antibodies in the sera of animals. This is the first study to utilize the rGroEL protein in a latex agglutination test (rGroEL-LAT), which offers a simple, rapid, and effective screening test. With further exhaustive validation, rGroEL-LAT has the potential to be implemented as a diagnostic tool at field-level laboratories with resource-limited settings.
LANGUAGE OF ORIGINAL DOCUMENT: English

Rajapakse S., Fernando N., Dreyfus A., Smith C., Rodrigo C.

Leptospirosis

(2025) Nature Reviews Disease Primers, 11 (1), art. no. 32
DOI: 10.1038/s41572-025-00614-5

ABSTRACT: Leptospirosis is a zoonotic bacterial infection that is prevalent across all continents and is caused by pathogenic spirochaetes of the genus Leptospira. Although infection can be asymptomatic, symptomatic disease can vary in severity from mild to severe illness, the latter characterized by icterus and/or multi-organ dysfunction and potentially death. An estimated one million cases of leptospirosis occur globally each year, resulting in ~60,000 deaths. The pathogenesis of severe leptospirosis is poorly understood but is believed to involve an interplay between genetic predisposition, pathogen virulence and dysregulated immune responses that trigger a cytokine storm with associated immunoparesis. Leptospira are susceptible to several low-cost antibiotics, including benzyl penicillin, doxycycline, cephalosporins and macrolides, when used in the early phase of infection. Late disease with organ dysfunction is treated with supportive care, and the benefit of antibiotics during late disease is doubtful. Very few countries have licensed a vaccine for human leptospirosis,

and available vaccines only protect against rodent-associated serogroups. Exposure control by behavioural modifications and personal protective measures are the major preventative measures in leptospirosis, and the efficacy of prophylactic antibiotics has not been confirmed in clinical trials. Future research is needed to accurately estimate leptospirosis disease burden across the globe, to understand the pathophysiology of severe leptospirosis to inform the design of targeted immunotherapies and vaccines, and to develop cost-effective and accurate point-of-care diagnostics.
LANGUAGE OF ORIGINAL DOCUMENT: English

Lo S.-H., Chen T.-C., Lin C.-Y., Hsieh H.-C., Lai P.-C., Lien W.-L., Yeh Y.-C., Lee I.-K., Chen Y.-H., Lu P.-L., Chang K.

Comparison of clinical and laboratory data between hantavirus infection and leptospirosis: a retrospective case series study in southern Taiwan

(2025) Transactions of the Royal Society of Tropical Medicine and Hygiene, 119 (5), pp. 464 - 471
DOI: 10.1093/trstmh/trae121

ABSTRACT: Background: Leptospirosis (LS) and hantavirus (HV) are rodent-borne diseases and share similar clinical manifestations, posing diagnostic challenges. Methods: This retrospective study compared clinical characteristics, laboratory data, complications and outcomes of 33 LS and nine HV cases in Kaohsiung, Taiwan, from 2006 to 2021. Results: Both LS and HV diseases had high rates of acute kidney injury (84.8% vs 66.7%) and hepatitis (65.6% vs 88.9%); LS showed more hyperbilirubinemia (70% vs 12.5% in HV, p=0.005), higher initial creatinine levels (2.9 vs 1.37, p=0.018) and elevated initial C-reactive protein (218.3 vs 28.6 mg/dl, p<0.001), but lower initial lymphocyte percentage (6.63% vs 14.2%, p=0.005) and platelets (138.7/mm3 vs 68.9, p=0.016) compared with HV. Microscopic hematuria was significantly more prevalent in LS (80% vs 28.65% in HV, p=0.016). Notably, the LS and HV groups exhibited statistically significant differences in thrombocytopenia (57.5% vs 100%, p=0.019), hyperbilirubinemia (70% vs 12.5%, p=0.005), shock (45.5% vs 0%, p=0.016) and hematuria (80% vs 28.6%, p=0.016). Neither group experienced fatalities. Conclusions: Fever, thrombocytopenia and acute kidney injury alert physicians to consider LS and HV for differential diagnosis. Elevated bilirubin, along with hematuria or shock, suggests a preferred diagnosis for LS.
LANGUAGE OF ORIGINAL DOCUMENT: English

Kahangwa P.N., Kitegile A.S., Machang'u R.S., Mhamphi G.G., Katakweba A.S.

The prevalence of Leptospira serovars in African giant pouched rats (Cricetomys spp.) from the Ngorongoro Conservation Area, Tanzania

(2024) Zoonotic Diseases, 4 (1), pp. 37 - 48
DOI: 10.3390/zoonoticdis4010005

ABSTRACT: Leptospirosis, also known as Weil's disease, is a febrile tropical disease of humans and diverse animals. The maintenance hosts of the infectious pathogen, Leptospira spp., are primarily rodents, while other warm-blooded animals and some reptiles are secondary or transient hosts of this pathogen. African giant pouched rats (Cricetomys spp.) have been identified to be important maintenance hosts of pathogenic leptospires in the tropical and subtropical regions of the world. This study assessed the seroprevalence of Leptospira spp. in the African giant pouched rats of the Ngorongoro Conservation Area (NCA), Tanzania, where there is close human, domestic animal, and wildlife interaction. A total of 50 African giant pouched rats were sampled between July 2020 and December 2021. Blood sera were screened for specific leptospiral

antibodies using a microscopic agglutination test (MAT), while urine and kidney tissues were examined for the pathogen and pathogen-specific genes using cultures and polymerase chain reactions (PCR), respectively. The pathogen detection varied from 0% in cultures to 6% via the MAT and 20% via PCR. The Fisher exact test was applied to compare positive cases detected through the diagnostic tests, and showed a significant difference in the indirect and direct detection of Leptospira serovars via the MAT and PCR. We conclude that pathogenic Leptospira serovar are found in the NCA and recommend that the NCA authority raises awareness of the existence of the Leptospira serovar in giant African pouched rats, and possibly other rodents. The NCA should initiate appropriate management strategies, including the guided disposal of household garbage, which is the major attractant of rodents to residential areas. Where necessary, the NCA should carry out limited rodent control and periodic monitoring of the pathogen carrier (rodent) populations.
LANGUAGE OF ORIGINAL DOCUMENT: English

Gamage C.D., Sykes J.E., Athapattu T.P.J., Senerathne P., Karunadasa U., Fuward M., Herath T., Muthusinghe B.D.S., Yoshimatsu K., Koizumi N.

Isolation of Leptospira licerasiae, Leptospira interrogans and Leptospira kmetyi from apparently healthy companion dogs vaccinated for leptospirosis

(2025) Veterinary Medicine and Science, 11 (3), art. no. e70375
DOI: 10.1002/vms3.70375
ABSTRACT: Animal reservoir hosts that shed pathogenic leptospires represent a considerable public health risk because they lack clinical signs of illness that might prompt handling precautions. In Sri Lanka, dog ownership is widespread. Dogs reside within homes and interact closely with humans, but they also roam freely in surrounding neighbourhoods. Dogs that carry pathogenic leptospires represent a source of environmental contamination and infection of domestic and livestock animals, posing a greater public health issue. The objectives of this study were to isolate and molecularly characterise leptospires from the blood and urine of 20 apparently healthy companion dogs vaccinated for leptospirosis using a 2-serovar vaccine in Kandy, Sri Lanka. Urine and blood samples were subjected to culture for leptospires in an EMJH medium. Growth of pathogenic/intermediate-pathogenic leptospires was confirmed using nested PCR assays targeting the flaB gene of P1 and P2 Leptospira subclades. Three (15%) of 20 urine specimens and one (5%) of 20 blood cultures yielded leptospires. Phylogenetic analysis revealed L. interrogans and L. kmetyi (P1 subclade) in urine specimens and L. licerasiae (P2 subclade) in the blood. Thus, despite vaccination, dogs in Sri Lanka can shed viable pathogenic/intermediate-pathogenic leptospires, with associated public health implications.
LANGUAGE OF ORIGINAL DOCUMENT: English

Lin F., Tang W., Zeng L., Peng L., Li Z., Fang Z.

A rare case of severe pneumonia caused by leptospirosis complicated with Jarisch-Herxheimer reaction

(2025) Diagnostic Microbiology and Infectious Disease, 113 (1), art. no. 116891
DOI: 10.1016/j.diagmicrobio.2025.116891
ABSTRACT: Background: Leptospirosis, a zoonotic disease caused by Leptospira species, presents significant diagnostic challenges due to its diverse clinical manifestations. Jarisch-Herxheimer reaction (JHR), an acute inflammatory response triggered by antibiotic therapy, can complicates disease management. Reports of leptospirosis with JHR remain rare, emphasizing the need for early diagnosis and appropriate

treatment. Case Presentation: An 80-year-old male presented with severe pneumonia, septic shock, and acute respiratory distress syndrome (ARDS). Diagnosis of leptospirosis was confirmed through metagenomic next-generation sequencing (mNGS) of bronchoalveolar lavage fluid, identifying Leptospira species. The patient was treated with piperacillin-tazobactam and supportive care, leading to full recovery. Conclusions: This case highlights the importance of mNGS in diagnosing rare infections and the need for vigilance in managing JHR. Clinicians should consider leptospirosis in patients with unexplained severe pneumonia and systemic inflammation.
LANGUAGE OF ORIGINAL DOCUMENT: English

Azman N.A., Rasudin N.S., Atan E.H., Abdul Ghafar N., Ismail R., Dedy Chandra N.D.S.
The association of climatic pattern and leptospirosis cases in Malaysia from 2013 to 2021
(2025) The Malaysian journal of pathology, 47 (1), pp. 77 - 84
ABSTRACT: INTRODUCTION: Leptospirosis is an emerging infectious disease exemplified by frequent outbreaks worldwide with more than one million cases and 50,000 deaths annually. A high number of cases have been reported in Southeast Asia, including Malaysia. This study aims to identify the relationship between climatic patterns and leptospirosis cases in Malaysia from 2013 to 2021. MATERIALS AND METHODS: The climatic data comprising temperature, humidity, and rainfall from 2013 to 2021 were obtained from the Malaysian Meteorological Department. Data was collected from five states in Malaysia: Kelantan, Perak, Selangor, Negeri Sembilan, and Sarawak. A Spearman correlation test was used to determine the relationship between the climatic pattern and Leptospirosis cases. RESULTS: In general, Leptospirosis cases fluctuated, with a maximum number of 8291 cases in 2015 and the lowest number being 1761 cases in 2021. The rainfall (mm) exhibited a fluctuating pattern from 2013 to 2021, with the highest total rainfall of 1938.5 mm in 2017. Temperature patterns varied from 2013 to 2021 with the highest temperature recorded was 27.60 degrees Celsius (°C) in 2016. The humidity increased steadily from 2017 to 2021, with the highest humidity recorded at 83.7% in 2020. A significant relationship was identified between the rainfall (mm) and Leptospirosis cases ($p<0.05$). CONCLUSION: The findings imply that the amount of rainfall has a significant relationship with leptospirosis cases and the highest cases of leptospirosis of 8291 cases, occurred in the year 2015 with a temperature of 27.3°C, a humidity of 82.4 %, and a total rainfall of 1559.1mm.
LANGUAGE OF ORIGINAL DOCUMENT: English

Imlau M., Browne J.A., Browett S.S., McDevitt A.D., McMahon B.J., Nally J.E., Jahns H.
Surveillance for Leptospira sp. in native and invasive shrews in Ireland compared with cohabitating shrews in France
(2025) Journal of wildlife diseases, 61 (2), pp. 477 - 482
DOI: 10.7589/JWD-D-24-00084
ABSTRACT: Leptospirosis is a complex and often underestimated global bacterial disease that continues to be of zoonotic concern. It is difficult to diagnose and has an unclear pathogenesis. Several new species of the genus Leptospira have been discovered in recent years; the impact of these species on animal health is unknown. In 2013, Leptospira tipperaryensis was first identified in greater white-toothed shrews (GWTSs, Crocidura russula) in Ireland, where they are an invasive species that displaces the native pygmy shrew (Sorex minutus). This study investigated the prevalence of Leptospira spp., including L. tipperaryensis, and their potential impact on the health of shrews from Ireland using histopathology (n=212), immunohistochemistry

(IHC; n=206), and quantitative PCR (n=168) on renal tissues. Shrews (n=81) from Belle Île, France were examined as a species and habitat control group using histopathology (n=81) and IHC (n=79). No Leptospira were detected with any of the methods in renal tissues from shrews sampled in Ireland and there was no significant renal pathology. In contrast, 34.6% (28/81) of shrews from Belle Île were positive on IHC for Leptospira sp. and had associated chronic nephritis in histopathology. The results do not indicate a negative impact by L. tipperaryensis or other Leptospira spp. on the health and distribution of the GWTS and the pygmy shrew in Ireland; onward transmission within the shrew population currently appears unlikely.
LANGUAGE OF ORIGINAL DOCUMENT: English

Leptospirosis
(2025) Nature reviews. Disease primers, 11 (1), pp. 33
DOI: 10.1038/s41572-025-00621-6
LANGUAGE OF ORIGINAL DOCUMENT: English

Machado M., Ciuffo C., Giannitti F., Silveira C.D.S., Perdomo Y., Queiroz-Machado C.R.R., Carriquiry R., Zarantonelli L., Menchaca A.
Acute fatal Leptospira kirschneri infection in suckling lambs and calves in Uruguay
(2025) Journal of Veterinary Diagnostic Investigation, art. no. 10406387251341234
DOI: 10.1177/10406387251341234
ABSTRACT: Leptospira kirschneri is an emerging human and animal pathogen. Here we describe 2 unrelated outbreaks of acute fatal leptospirosis caused by L. kirschneri in suckling lambs and calves diagnosed following a flooding event in the spring of 2023 in northern Uruguay. In outbreak 1, the sheep flock was raised in a low-lying area previously used for rice cultivation; 20 lambs died after developing apathy, jaundice, and hemoglobinuria. In outbreak 2, 2 calves were found dead. At autopsy, 4 lambs and 2 calves had marked jaundice, hemoglobinuria, dark-red kidneys, and hepatomegaly. Microscopically, we found marked hemoglobinuric nephrosis, lymphohistiocytic tubulointerstitial nephritis, hepatocellular dissociation, and random hepatocellular necrosis with periportal lymphohistiocytic hepatitis and canalicular cholestasis. Positive immunostaining for Leptospira sp. was found in the liver (lamb C), both the liver and kidney (calf B), and the liver (calf A). Leptospira kirschneri was PCR-confirmed using kidney and liver samples from the autopsied animals. Acute leptospirosis caused by L. kirschneri has not been reported previously in sheep and cattle, to our knowledge. Our findings highlight that L. kirschneri infection can cause acute leptospirosis in unvaccinated lambs and calves.
LANGUAGE OF ORIGINAL DOCUMENT: English

Miyahara S., Yoneda T., Kimura S., Fukuda K., Ogawa M., Kimitsuki K., Saito N., Nishizono A., Saito M.
Development of a PCR method for rapid detection of Leptospira from one microliter of whole blood
(2025) Diagnostic Microbiology and Infectious Disease, 113 (1), art. no. 116894
DOI: 10.1016/j.diagmicrobio.2025.116894
ABSTRACT: Leptospirosis is a worldwide zoonosis caused by pathogenic Leptospira. Its diagnosis is usually difficult, often resulting in delayed antimicrobial therapy and worse outcomes. Nucleic acid amplification tests of blood provide reliable Leptospira detection in acute infections, but the requirement for skilled personnel and expensive equipment still limits their widespread use, especially in low-resource settings. We, therefore,

developed a microfluidic-based PCR (mbPCR) assay to detect pathogenic Leptospira, aiming to simplify sample preparation. The PicoGene® PCR1100 device was integrated with primers and probes targeting the 16S rDNA of pathogenic Leptospira. The assay was evaluated for its ability to detect the spirochete directly in specimens, omitting the DNA purification step. Direct detection from blood samples was assessed using cultured live Leptospira interrogans strain L495 spiked into whole blood of hamsters and humans to determine the lower limit of detection. In addition, whole blood collected from the infected hamsters was examined by mbPCR. Using the mbPCR assay, live leptospires were detected at a concentration of 7.78 (95 % CI, 3.83–15.8) leptospires/µL in phosphate-buffered saline (PBS) and 1 × 10^2 leptospires/µL in whole blood. The detection sensitivity was unaffected by the host animal species and the type of anticoagulant. Furthermore, mbPCR successfully identified the bacteria in as little as 1 µL of whole blood obtained from a hamster model of leptospirosis. Although further validation is required, this method has the potential to provide timely and straightforward point-of-care diagnostics, and is anticipated to see expanded use in developing regions.
LANGUAGE OF ORIGINAL DOCUMENT: English

Ziliotto M., Chies J.A.B., Ellwanger J.H.
Extreme weather events and pathogen pollution fuel infectious diseases: the 2024 flood-related leptospirosis outbreak in Southern Brazil and other red lights
(2024) Pollutants, 4 (3), pp. 424 - 433
DOI: 10.3390/pollutants4030028
ABSTRACT: The emergence of infectious disease outbreaks and ‘superbugs’ related to pollution combined with climate change is a current problem, not just a future threat. In May 2024, an extreme flood hit the Rio Grando Sul State, southern Brazil, triggering an important leptospirosis outbreak in urban settings with deficient sanitation systems. This and other cases discussed in this article exemplify how extreme weather events exacerbate the consequences of environmental pollution by multiple classes of pathogens in the global scenario of increasing anthropogenic pressures on the environment. A combination of actions to combat climate change and improvements in sanitation systems is essential to mitigate this problem.
LANGUAGE OF ORIGINAL DOCUMENT: English

Peters M., Field C.L., Hortensius L.M., Soper J., Burco J., Kelly T.R., Prager K.C.
Evaluation of two serologic tests for rapid detection of anti-Leptospira antibodies in California sea lions (Zalophus californianus)
(2025) Journal of wildlife diseases, 61 (2), pp. 461 - 466
DOI: 10.7589/JWD-D-24-00055
ABSTRACT: Leptospirosis is a bacterial zoonosis impacting wild and domestic animals globally. Leptospira interrogans serovar Pomona is endemic in free-ranging California sea lions (CSLs; Zalophus californianus), and leptospirosis is frequently diagnosed in stranded CSLs. Serum microscopic agglutination test (MAT) is a commonly performed diagnostic assay, and CSLs with clinical disease have reliably elevated MAT titers. However, MAT results may not be available for several days after sampling. Given the zoonotic and high transmission potential of Leptospira spp., a point-of-care diagnostic test would be valuable in rehabilitation and managed care settings and during outbreak response efforts. The IDEXX SNAP and Zoetis WITNESS anti-Leptospira antibody tests are rapid diagnostic tools that have been validated in dogs and give a qualitative (positive or negative), not quantitative (exact titer), result. The SNAP test uses ELISA to detect both

immunoglobulin (Ig)M and IgG antibodies, whereas the WITNESS test is a lateral flow assay that only detects IgM. We compared SNAP and WITNESS results with MAT results by using serum collected from stranded and free-ranging CSL with negative, low, medium, and high anti-Leptospira antibody titers as previously determined by MAT. Percent agreement between SNAP and MAT results was high, with a Cohen's kappa statistic of 0.957. No WITNESS tests were positive. These findings suggest that the SNAP test may be useful for detecting anti-Leptospira antibodies and ruling out leptospirosis in CSL.
LANGUAGE OF ORIGINAL DOCUMENT: English

Bandara J.M.R.P., Rosairo A., Ranasinghe G.S., De Silva T.D., Gawarammana I.B.

Is therapeutic plasma exchange effective in leptospirosis-associated severe pulmonary haemorrhagic syndrome? A systematic review

(2025) Transactions of the Royal Society of Tropical Medicine and Hygiene, 119 (5), pp. 453 - 463
DOI: 10.1093/trstmh/trae107
ABSTRACT: Leptospirosis is a re-emerging zoonosis fast becoming a global burden. Pulmonary haemorrhages are a deadly complication, with case fatality rates >50%. Systemic vasculitis is thought to be the pathological process responsible for pulmonary haemorrhages and therapeutic plasma exchange (TPE) is one of the treatments offered. This systematic review aims to evaluate the effectiveness of TPE in managing leptospirosis-associated severe pulmonary haemorrhagic syndrome (SPHS). A systematic review was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis protocol. The search used Medical Subject Headings in PubMed with keywords 'Leptospirosis' OR 'Leptospira' OR 'Weil disease' AND 'plasmapheresis' OR 'plasma exchange' AND 'pulmonary haemorrhage' OR 'alveolar haemorrhage'. The search was widened to include the Google Scholar database. The review was confined to English-language articles and focused on primary research studies. Nineteen articles were considered for analysis. There were no randomized controlled trials. A non-randomized trial and a retrospective cohort documented recovery following adjuvant TPE treatment. Most case reports mention significant improvement and complete recovery following administration of TPE. One case reported the death of a patient despite treatment. However, this review revealed a lack of strong evidence endorsing the routine application of TPE as a therapeutic intervention for cases of SPHS. Thus we recommend the initiation of a well-structured randomized controlled trial to ensure an accurate assessment of the efficacy of TPE.
LANGUAGE OF ORIGINAL DOCUMENT: English

Silva-Ramos C.R., Matiz-González J.M., Barrero-Rubiano C.A., Villar J.D., Cuéllar-Sáenz J.A., López-Rivera C., Robayo-Sánchez L.N., Henao-Osorio J.J., Cardona-Giraldo A., Mejorano-Fonseca J.A., Agudelo-Flórez P., Cortés-Vecino J.A., Faccini-Martínez Á.A., Cuervo C., Ramírez-Chaves H.E., Hidalgo M., Ramírez-Hernández A.

Molecular detection and characterization of Leptospira species in bats and other small wild mammals from Villeta municipality, Colombia

(2025) Comparative Immunology, Microbiology and Infectious Diseases, 120, art. no. 102355
DOI: 10.1016/j.cimid.2025.102355
ABSTRACT: Leptospira is a bacterial genus which includes several pathogenic species. Wild mammals can act as reservoir hosts, shedding bacteria in their urine. Leptospirosis is an important health problem in Villeta, but data regarding potential reservoirs hosts and natural sources of infection are still scarce. We aimed to

detect and characterize the presence of Leptospira among small wild mammals from Villeta municipality, Colombia. Small wild mammals from three orders: Didelphimorphia, Chiroptera and Rodentia, were sampled in the region. DNA was extracted from kidney samples and screened for Leptospira through real-time PCR targeting a the 16 s rRNA gene. Positive samples were screened through conventional PCR using five complementary genes: adk, icdA, lipL32, lipL41 and secY. Amplicons were sequenced and used for phylogenetic analysis. A total of 75 kidney samples were collected from three small wild mammal orders: 62 bats, 5 opossums, and 7 rodents. Leptospira spp. was detected in 38.7 % of the samples, with bats presenting the most frequent infection rate (43.5 %). The infection rate varied by sampling site, with the highest frequency observed in Mave village (57.1 %). Concatenated phylogenetic analysis revealed that all sequences clustered within the P1/Pathogenic Leptospira major clade, forming three subclades: two bat-related Leptospira subclades, and one subclade including Leptospira interrogans, Leptospira kirschneri, and Leptospira noguchii species. This study describes the presence of Leptospira among bats and opossums from Villeta, Colombia. It also identifies the circulation of several P1/pathogenic Leptospira species among bats forming three clusters, two of them composed exclusively of bat-related leptospires, and one together with recognized pathogenic species.
LANGUAGE OF ORIGINAL DOCUMENT: English

Stone N.E., Hamond C., Clegg J.R., McDonough R.F., Bourgeois R.M., Ballard R., Thornton N.B., Nuttall M., Hertzel H., Anderson T., Whealy R.N., Timm S., Roberts A.K., Barragán V., Phipatanakul W., Leibler J.H., Benson H., Specht A., White R., Lecount K., Furstenau T.N., Galloway R.L., Hill N.J., Madison J.D., Fofanov V.Y., Pearson T., Sahl J.W., Busch J.D., Weiner Z., Nally J.E., Wagner D.M., Rosenbaum M.H.

Host population dynamics influence Leptospira spp. transmission patterns among Rattus norvegicus in Boston, Massachusetts, US

(2025) PLoS Neglected Tropical Diseases, 2025-April, art. no. e0012966
DOI: 10.1371/journal.pntd.0012966
ABSTRACT: Leptospirosis (caused by pathogenic bacteria in the genus Leptospira) is prevalent worldwide but more common in tropical and subtropical regions. Transmission can occur following direct exposure to infected urine from reservoir hosts, or a urine-contaminated environment, which then can serve as an infection source for additional rats and other mammals, including humans. The brown rat, Rattus norvegicus, is an important reservoir of Leptospira spp. in urban settings. We investigated the pres-ence of Leptospira spp. among brown rats in Boston, Massachusetts and hypothe-sized that rat population dynamics in this urban setting influence the transportation, persistence, and diversity of Leptospira spp. We analyzed DNA from 328 rat kidney samples collected from 17 sites in Boston over a seven-year period (2016–2022); 59 rats representing 12 of 17 sites were positive for Leptospira spp. We used 21 neutral microsatellite loci to genotype 311 rats and utilized the resulting data to investigate genetic connectivity among sampling sites. We generated whole genome sequences for 28 Leptospira spp. isolates obtained from frozen and fresh tissue from some of the 59 positive rat kidneys. When isolates were not obtained, we attempted genomic DNA capture and enrichment, which yielded 14 additional Leptospira spp. genomes from rats. We also generated an enriched Leptospira spp. genome from a 2018 human case in Boston. We found evidence of high genetic structure among rat populations that is likely influenced by major roads and/or other dispersal barriers, resulting in distinct rat population groups within the city; at certain sites these groups persisted for multiple years. We identified multiple distinct phylogenetic clades of L. interrogans among rats that were tightly linked to distinct rat

populations. This pat-tern suggests L. interrogans persists in local rat populations and its transportation is influenced by rat population dynamics. Finally, our genomic analyses of the Lepto-spira spp. detected in the 2018 human leptospirosis case in Boston suggests a link to rats as the source. These findings will be useful for guiding rat control and human leptospirosis mitigation efforts in this and other similar urban settings.
LANGUAGE OF ORIGINAL DOCUMENT: English

Petakh P., Oksenych V., Kamyshnyi O.

Prevalence of leptospirosis among soldiers: a systematic review

(2025) PLoS Neglected Tropical Diseases, 19 (3), art. no. e0012927
DOI: 10.1371/journal.pntd.0012927

ABSTRACT: Leptospirosis is a bacterial disease that spreads through water and soil contaminated with infected animal urine. Soldiers have a higher risk of infection because they often work in wet and muddy conditions. This systematic review examines how common leptospirosis is among military personnel. Studies published between January 2000 and November 2024 were collected from PubMed, Web of Science, and Scopus, following PRISMA guidelines. The review included studies that used laboratory tests to confirm leptospirosis cases in soldiers. Out of 67 studies, three met the inclusion criteria. These studies were conducted in Malaysia, Hawaii, and Honduras, with sample sizes between 488 and 1, 000 soldiers. The infection rate ranged from 1.4% to 16.2%, with higher rates in tropical regions. Leptospirosis is often underdiagnosed in military personnel because symptoms are similar to other diseases, and testing is not always available. More awareness, better protective measures, and improved laboratory tests are needed to prevent infections. This review highlights the importance of better surveillance and health strategies for soldiers at risk of leptospirosis.
LANGUAGE OF ORIGINAL DOCUMENT: English

Wijenayake A.P.H., Abeysinghe P., Suaris V.M., Dharmarathna W.B.S.M.

The role of therapeutic plasma exchange in Leptospirosis patients

(2025) Transfusion and Apheresis Science, 64 (3), art. no. 104147
DOI: 10.1016/j.transci.2025.104147
LANGUAGE OF ORIGINAL DOCUMENT: English

Khan M.A., Ur-Rehman A.

A systematic review of zoonotic pathogens and the risk of future pandemics: the focus areas, potential threats, and global readiness

(2025) Premier Journal of Science, 6, art. no. 100049
DOI: 10.70389/PJS.100049

ABSTRACT: Zoological diseases are a real potential danger to populations and are especially dangerous due to the possibility of future epidemics due to cross-species transmission. As a systematic review, this article offers an understanding of zoonotic pathogens with high pandemic potential, vulnerable areas affected by zoonotic spillovers, and worldwide preparedness for future zoonoses. A systematic electronic search in PubMed, Scopus, Web of Science, and Cochrane Library databases yielded 410 articles published from 2000 to 2023; 60 articles were selected for further analysis. Zoonotic diseases with their pathogens that are connected with the disease state and animals include Nipah virus, Leptospira, and coronaviruses. There are

four primary transmissions: Possible contact with wild animals, live wildlife markets, and contaminated water. Research shows that countries in Southeast Asia, sub-Saharan Africa, and Latin America are most at risk of epidemic spillovers. Although some progress has been made and the global health community is better prepared to cope with pandemics and epidemics, weaknesses remain: For example, surveillance and requisite healthcare systems in low-and middle-income countries. That is why this review underlines the need for global cooperation, improved diagnostics of zoonotic diseases, and more effective application of prevention measures to decrease the probabilities of future pandemic risks.
LANGUAGE OF ORIGINAL DOCUMENT: English

Cardoso T.L., Pereira I.L., Wozeak D.R., Neto A.C.P.S., Balassiano I.T., Hartwig D.D.
ErpY-LemA: s breakthrough in human leptospirosis diagnosis
(2025) Diagnostic Microbiology and Infectious Disease, 113 (2), art. no. 116883
DOI: 10.1016/j.diagmicrobio.2025.116883
ABSTRACT: Leptospirosis remains a significant public health concern worldwide, particularly in tropical regions, where its diagnosis is often challenging due to nonspecific symptoms and limitations of current diagnostic methods. In this study, we evaluated the diagnostic potential of the recombinant chimera ErpY-LemA constructed from two Leptospira proteins with known immunogenic properties. The chimera was successfully expressed in Escherichia coli and demonstrated strong antigenicity, effectively recognizing sera from hamsters infected with diverse Leptospira serovars, indicating its non-serovar-specific nature ($P < 0.001$). ELISA assays were conducted using 80 human sera previously characterized by MAT. In the acute phase, IgM detection achieved 95 % of sensitivity and specificity (cut-off = 0.15, AUC = 0.990; $P < 0.001$). In the convalescent phase, IgG detection showed 80 % sensitivity and 100 % specificity (cut-off = 0.16, AUC = 0.968; $P < 0.001$). When the unknown disease phase were assessed, both IgG and IgM ELISAs maintained high diagnostic performance, with sensitivities and specificities ≥95 % and AUC values above 0.98. These findings highlight the ErpY-LemA chimera as a promising antigen for the development of a rapid, cost-effective serological diagnostic test for human leptospirosis, with high sensitivity and specificity regardless of disease stage or infecting serovar.
LANGUAGE OF ORIGINAL DOCUMENT: English

Cardoso T.L., Wozeak D.R., Pereira I.L., Dias N.L., Pinto Seixas Neto A.C., Rodrigues R.O., Hartwig D.D.
Chimeric recombinant protein (rErpY-LemA) as innovative tools for animal leptospirosis serodiagnosis
(2025) Microbial Pathogenesis, 205, art. no. 107665
DOI: 10.1016/j.micpath.2025.107665
ABSTRACT: Leptospirosis is a zoonosis with widespread worldwide. Transmission occurs through direct or indirect contact with contaminated water, urine, milk, and soil. Symptoms are variable but can lead to significant losses for producers, making it a major economic concern in livestock farming. The Microscopic Agglutination Test (MAT) is the gold standard for leptospirosis diagnosis but presents limitations, such as the need for live Leptospira cultures, specialized infrastructure, and trained personnel. It is time-consuming, labor-intensive, and poses health risks due to live pathogen handling. Simpler, safer alternatives, such as the Enzyme-Linked Immunosorbent Assay (ELISA) using recombinant antigens, are needed. In this study, we developed an ELISA using a recombinant chimera, rErpY-LemA, which combines the ErpY-like and LemA Leptospira proteins as

an antigen. The chimera was tested with sera from various Leptospira serovars and showed significant reactions (P < 0.001) with antibodies against 12 strains. The chimera showed promising diagnostic performance in cattle (n = 335) and sheep (n = 259) sera, confirmed by MAT. The AUC was 0.903 for bovine (sensitivity: 98.3–100 %, specificity: 60.9–78.2 %) and 0.917 for ovine (sensitivity: 97.7–100 %, specificity: 57.1–76.5 %). The test showed strong agreement with MAT, with a PPV of 81.3 %–90.2 % for cattle and 77.4 %–88.4 % for sheep. These results confirm that rErpY-LemA is an effective antigen for diagnosing leptospirosis in cattle and sheep, being able to detect different serovars. Thus, ELISA using the rErpY-LemA chimera is a promising tool for leptospirosis screening in livestock, offering a safer and more practical alternative to MAT.
LANGUAGE OF ORIGINAL DOCUMENT: English

Borba M.A.D.C., Melo L.E.H., Tenório T.G.D.S., Raymundo E.F., Rizzo H., Vasconcellos S.A.

Occurrence and characterization of anti-Leptospira spp. antibodies in small ruminants raised in the state of Pernambuco, Brazil [Ocorrência e caracterização de anticorpos anti-Leptospira spp. em pequenos ruminantes criados no estado de Pernambuco, Brasil]

(2025) Medicina Veterinaria (Brazil), 19 (1), pp. 76 - 83
DOI: 10.26605/medvet-v19n1-6998
ABSTRACT: The objective of this study was to investigate the prevalence of anti-Leptospira spp. antibodies and their main serogroups in goats and sheep raised in the four mesoregions of the state of Pernambuco, Brazil. A total of 631 samples were examined from small ruminants raised in 18 herds across nine municipalities distributed in the mesoregions Metropolitana do Recife, Mata Pernambucana, Agreste Pernambucano, and São Francisco Pernambucano. The Microscopic Agglutination Technique (MAT) was performed using live antigens from 24 serovars belonging Leptospira spp. serogroups, with samples considered reagents when titers were ≥100. The prevalence of seropositive goats was 33.8% (100/296), while in sheep, it was 33.7% (113/335), totaling 33.8% (213/631) of seroreactive small ruminants in the study. The mesoregion with the highest frequence of seropositive animals was Mata (52.1%), followed by Agreste (32.5%), Metropolitana (31.6%) and São Francisco (23.5%). All properties had at least one seropositive goat and one seropositive sheep, with the Autumnalis serovar being the most frequently detected, followed by Patoc. The results indicated that Leptospira spp. is widely disseminated in the herds analyzed in the state of Pernambuco, with a predominance of the Autumnalis serovar, suggesting that small ruminants may be adapted to this variant.
LANGUAGE OF ORIGINAL DOCUMENT: Portuguese

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

High prevalence and diversity of Leptospira pathogenic serogroups in pigs, cows and free roaming dogs from undeserved rural communities in the coastal region of Ecuador

(2025) One Health, 20, art. no. 101083
DOI: 10.1016/j.onehlt.2025.101083
ABSTRACT: Leptospirosis is a zoonotic disease with global distribution but endemic to tropical regions that affects animal production systems. In Ecuador, leptospirosis is endemic with records of human outbreaks dated from more than one century ago, and where the role of animal reservoirs in the transmission dynamics

is not well understood. In this study, we carried out a serological surveillance by Microagglutination Test with a panel of 24 serovars for 545 animals represented by pigs and cows, and free roaming dogs from undeserved rural communities in the province of Guayas (Coastal Region of Ecuador). Our results underscore a wide diversity of pathogenic serogroups with high prevalence across animal species including Bataviae, Australis, Pomoma, Canicola, Djasiman or Grippotyphosa. Moreover, a high seroprevalence for antibodies against Leptospira was found across all the species analyzed, with values of 87 % (CI95 %: 70,6–100) in dogs, 66.7 % (CI95 %: 53,6-79,7) in cows, and 100 % (CI95 %: 80,4–100) in pigs. Our results confirm previous finding about the complex epidemiology of leptospirosis in Ecuador, comprising multiples serogroups and animal reservoirs. Therefore, we strongly recommend incorporating an integrative One Health approach for the surveillance and prevention of leptospirosis in Ecuador.
LANGUAGE OF ORIGINAL DOCUMENT: English

Benammar L., Benseghir H., Hezil D., Bouchemla F., Zaidi S., Bassas A., Ghalmi F.
ELISA and MAT tests for Leptospira interogans detection from cattle in Eastern Algeria
(2025) Journal of the Hellenic Veterinary Medical Society, 76 (1), pp. 8905 - 8916
DOI: 10.12681/jhvms.38367
ABSTRACT: Leptospira interrogans is one of the most common infectious organisms worldwide that causes several losses in cattle. As far as we know, few previous studies have focused on Leptospira interrogans infection in cattle from Algeria. This study aimed to assess the prevalence of bovine leptospirosis, identify selected risk factors, and compare two different detection tests. 611 blood samples from 67 cattle farms were collected in six Algerian provinces; Algiers, Boumerdès, Bordj Bou Arreridj, Sétif, Batna, and Souk Ahres. Sera samples were analyzed for the presence of antibodies against five serovars of Leptospira interrogans using a microscopic agglutination test (MAT), using 50% agglutination, at a dilution ≥1: 100 as a cut-off point. A commercial indirect enzyme-linked immunosorbent assay (ELISA) test was used to determine the seroprevalence against L. interrogans serovar Hardjo. Moreover, a survey through breeders' questionnaires was conducted to identify the potential risk factors of Leptospira interrogans infection. The seroprevalence of L. interrogans infection using MAT in the cows was 17.02% (95% confidence interval [CI]: 14.12- 20.24) and in the farms was 83.58% (95% CI: 59.31-81.99). The most commonly detected serovar was Hardjo 6.71% (95% CI: 4.86-8.99) followed by Icterohaemorrhagiae 5.07% (95% CI: 3.47-7.12). Finally, the last serovar present was the Grippotyphosa 2.78 (95% CI: 1.63-4.42). The comparison between the two serological methods, considering the MAT as the reference test, shows that the PrioCHeck ELISA kit had a sensitivity of 63.4% (95% CI: 48.7-78.2), a specificity of 98.9% (95% CI: 98.1-99.8), and a reliability of 96.6% (95% CI: 95.1-98.0). The kappa coefficient was 0.62, and the McNemar test showed a P = 0.23. Multivariable logistic regression analysis showed that the semi-intensive system was a protective factor against leptospirosis, with an odds ratio of 0.35 (95% CI: 0.16-0.78). The study findings indicate that leptospirosis is a serious issue in farms located in selected provinces in Algeria, with a high incidence rate noted there. The semi-intensive system's significance as a leptospirosis protective factor is to create control strategies that decrease the probability of infection in both humans and cattle.
LANGUAGE OF ORIGINAL DOCUMENT: English

Julien M., Rafat C., Raffray L., Vacher-Coponat H., Allou N., Allyn J., Jabot J., Lombardi Y.

Immediate or delayed initiation of renal replacement therapy in patients with leptospirosis and acute kidney injury: a target trial emulation

(2025) Annals of Intensive Care, 15 (1), art. no. 65

DOI: 10.1186/s13613-025-01477-5

ABSTRACT: Background: Anecdotal evidence suggests that early renal replacement therapy (RRT) may improve the mortality associated with acute kidney injury (AKI) in patients with leptospirosis. Conversely, several randomized controlled trials (RCTs) conducted in intensive care units have refuted the positive impact of early RRT on mortality in patients with AKI and other causes of sepsis. Methods: In this emulated RCT utilizing a propensity score-weighted logistic regression performed in the two academic centers on the island of La Réunion, France, between 2010 and 2020, we evaluated the impact of the timing of RRT on a composite outcome of mortality or new-onset or worsening chronic kidney disease (CKD) within a year, in patients hospitalized with leptospirosis, Stage 3 AKI, and no immediate need for RRT. Results: We included 295 consecutive patients with leptospirosis and Stage 3 AKI: 82 (28%) began RRT within 48 h of admission (“early” group), 213 (72%) did not start RRT within 48 h (“delayed” group). In the delayed group, 53/213 (25%) patients eventually required RRT. 59/295 patients (20%) met the primary outcome: 32 (15%) in the delayed group and 27 (33%) in the early group. The odds ratio (OR) for primary outcome occurrence before weighing was 2.78 (95% confidence interval CI 1.53 to 5.01, $p < 0.001$; reference: delayed group) and after weighting was 2.08 (95% CI: 1.01 to 4.26, $p = 0.046$). In secondary analyses, there was a significantly higher probability of CKD occurrence in the early group (OR 2.74, 95% CI 1.25 to 6.0, $p = 0.012$). Mortality at 1 year did not differ between groups (OR 0.76, 95% CI 0.21 to 2.68, $p = 0.666$). Conclusion: Early initiation of RRT may be associated with an increased risk of death and development of CKD within 1 year in patients with leptospirosis and Stage 3 AKI.

LANGUAGE OF ORIGINAL DOCUMENT: English

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

Leptospirosis dynamics with misdiagnosis: a review

(2025) Journal of Applied Mathematics, 2025 (1), art. no. 1691122

DOI: 10.1155/jama/1691122

ABSTRACT: Leptospirosis is a zoonosis with global distribution, and a wide variety of clinical symptoms often lead to misclassification as other febrile conditions. Clinical misclassification has remained the baseline for the diagnosis of leptospirosis, which poses an uphill challenge to clinical management and epidemiological modeling, which could distort the estimation of our burden of disease, thus further delaying public health interventions. This paper provides an overview of trends in modelling approaches for leptospirosis, with a focus on one of the major challenges of diagnostic inaccuracies in relation to effects on model reliability. Finally, the shortcomings of the classic models are discussed in the context that misdiagnosis has not been well represented, and heeding the strides that have recently been made towards developing ways in which diagnostic uncertainty can be incorporated within these frameworks. Enhanced model accuracy of leptospirosis for robustness will help enhance our understanding of the dynamics of diseases to better inform effective intervention strategies. The importance of interdisciplinary communication between epidemiologists, clinicians, and modelers in addressing the misdiagnosis of infectious disease models is outlined herein.

LANGUAGE OF ORIGINAL DOCUMENT: English

Kaviprawin M., Raju M., Sakthivel M., Ramalingam A.

Zoonotic disease outbreaks reported under India's integrated disease surveillance programme, 2018–2023: a cross-sectional analysis of national surveillance data

(2025) The Lancet Regional Health - Southeast Asia, 37, art. no. 100601

DOI: 10.1016/j.lansea.2025.100601

ABSTRACT: Background: Timely analysis of zoonotic outbreak surveillance data is critical for assessing the effectiveness of outbreak detection and reporting systems, a priority for global health security. We described the zoonotic disease outbreaks notified under the Integrated Disease Surveillance Program (IDSP) in India between 2018 and 2023 to identify temporal trends and spatial variation. Methods: We conducted a cross-sectional study by reviewing zoonotic disease outbreak line-list data from IDSP weekly outbreak reports and analyzed by year, region, and timeliness of reporting. We conducted a mixed Poisson regression to estimate the change (β coefficient) in outbreaks over the years and visualized maps in R software. Findings: Of the 6948 outbreaks reported in IDSP, 583 (8.3%) were zoonotic, with a median of seven monthly zoonotic outbreaks. Outbreaks significantly increased over the years (β coefficient = 0.07 [0.02–0.12]). Japanese encephalitis accounted for 29.5% of zoonotic outbreaks, followed by leptospirosis (18.7%) and scrub typhus (13.9%). The northeast region contributed 35.8% of zoonotic disease outbreaks, followed by the southern (31.7%) and western regions (15.4%). One-third (34.6%) of outbreaks were reported late, and they declined over the years (52.6% in 2019, 40.9% in 2021, and 5.2% in 2023). The follow-up reports were unavailable for 97.2% of zoonotic outbreaks notified. Interpretation: We documented the regions with high notification of zoonotic disease outbreaks under India's national-level outbreak surveillance system. Critical gaps in weekly outbreak reports were identified, particularly the lack of follow-up documentation. To address these gaps, we recommend strengthening disease-specific surveillance systems in hotspot regions. Funding: The present study is non-funded.

LANGUAGE OF ORIGINAL DOCUMENT: English

Chalesh A., Khaki P., Moradi Bidhendi S., Tebianian M., Tarnabi M.T.

Expression and immunogenicity analysis of recombinant Leptospira interrogans surface protein LigA in mouse model

(2025) Veterinary Medicine and Science, 11 (3), art. no. e70360

DOI: 10.1002/vms3.70360

ABSTRACT: Background: Pathogenic strains of spirochetes of Leptospira spp. cause a globally distributed zoonotic disease called leptospirosis. The disease has several clinical manifestations, ranging from asymptomatic and subclinical infection to fatal and severe forms. Hypothesis/objectives: The aim of this study was to produce a recombinant Leptospiral immunoglobulin-like surface protein-A (r-LigA) antigen of Leptospira interrogans in a prokaryotic expression system and to assess its efficacy in a mouse model. Materials and methods: The optimal epitopes of the LigA protein were identified via bioinformatics studies. The pET32a+-LigA plasmid construct was cloned into E. coli Top10-DH5α, expressed in E. coli pLysS strains, and subjected to different IPTG concentrations at different times and temperatures. The expressed r-LigA was purified using nickel-affinity (Ni-NTA) chromatography from the insoluble fraction and reassessed by SDS-PAGE, western blotting, dot blotting, and Bradford assay. Female Balb/C mice were immunised subcutaneously with r-LigA alone or emulsified in Freund's adjuvant and subsequently boosted at 2 and 4 weeks. Specific antibody levels were evaluated by indirect ELISA. Results: Bioinformatics analysis identified the key antigenic region of LigA

spanning amino acids 852 to 1210. Colony PCR and digestion confirmed the successful transformation. Induction using 0.5 mM IPTG at 30°C for 5 h was found to be optimal. Overexpression of r-LigA under optimised conditions accumulated proteins as inclusion bodies. Purification of r-LigA under native conditions using optimised Ni-NTA yielded 1050 µg/mL protein and high immunogenicity by effectively stimulating the immune system in female Balb/C mice. Conclusions: These findings support r-LigA as a strong candidate for future leptospirosis diagnostic tools and subunit vaccine development.

LANGUAGE OF ORIGINAL DOCUMENT: English