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Epidemiology of human and animal leptospirosis in Kenya: A systematic review and meta-analysis of disease occurrence, serogroup diversity and risk factors

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ADMINISTRATIVE INFORMATION**Support** - German Federal Institute for Risk Assessment.**Review Stage at time of this submission** - Completed but not published.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202470097**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 24 July 2024 and was last updated on 24 July 2024.**INTRODUCTION**

Review question / Objective An in-depth review of leptospirosis covering the range of hosts, risk factors, diagnostic methods used, prevalent serovars and species, and prevalence estimates in various hosts is currently lacking in Kenya. This information is critical in control and prevention strategies. Therefore, we aim to conduct this systematic review of leptospirosis in humans and animals in Kenya to answer these questions, reveal key knowledge gaps to inspire future research and inform control strategies.

Condition being studied Leptospirosis is a common but neglected zoonotic disease globally. It is caused by bacteria of the genus *Leptospira* which can infect a wide range of mammalian hosts. These hosts can act as reservoirs of the bacteria, but rodents are the most important. Humans primarily acquire leptospirosis either directly via contact with an infected animal or

indirectly when in contact with soil or water contaminated with urine from an infected animal.

METHODS

Search strategy “leptospirosis”, “leptospira”, “leptospir*”, “Weil disease”, “Weil’s disease”, “Weils disease”, “Spirochaetal jaundice”, “human”, “wildlife”, “domestic”, “rodent”, “ruminant”, “cattle/bovine”, “camel/dromedary”, “sheep/ovine”, “goat/caprine”, “prevalence”, “incidence”, “prevention”, “control”, “risk” and “Kenya”.

Participant or population The population to be considered includes (samples from or qualitative information from/about) humans, animals and environments in Kenya.

Intervention This is not applicable.

Comparator This is not applicable.

Study designs to be included All quantitative and qualitative studies on leptospirosis in Kenya.

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Eligibility criteria Studies based on animal and human populations in/originally from Kenya investigating any aspect (both qualitative and quantitative research).

Information sources African journals online, the AGRIS (FAO) database, Embase, ProMED-mail, PubMed, Scopus, Web of Science, and the institutional repositories of 33 Kenyan universities and colleges.

Main outcome(s) An estimation of summary effects of the prevalence of leptospirosis in hosts will be attempted when a high number of studies can be found for the host.

Data management Data will be extracted in XLSX format using a data extraction form.

Quality assessment / Risk of bias analysis The meta-analysis will only be performed on cross-sectional studies published in peer-reviewed journal articles that reported the prevalence in hosts as tested from blood, serum or kidney samples using all diagnostic tests, considering MAT titres $\geq 1:100$.

Strategy of data synthesis Data will be imported into R statistical software environment where summary statistics will be performed and plots generated. Meta-analyses will also be conducted to determine summary effects and between-study heterogeneity.

Subgroup analysis Subgroup analyses will be performed using the type of diagnostic test applied (i.e. culture, the microscopic agglutination test, ELISA, PCR results) where possible.

Sensitivity analysis Sensitivity analyses will be attempted depending on the number of studies found.

Language restriction There will be no language restrictions placed on the searches.

Country(ies) involved Kenya, Germany.

Keywords Leptospira, One Health, disease control, epidemiology, Kenya.

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