INPLASY

A 15-year One Health approach to antimicrobial resistance in Kuwait from hospitals to environmental contexts: A systematic review

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ADMINISTRATIVE INFORMATION

Support - This research received no external funding.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 3 August 2025 and was last updated on 3 August 2025.

INTRODUCTION

Review question / Objective Review questions: 1. What has been the status of AMR in Kuwait during the past 15 years (2009-2024)?
2. How do several sectors, including human health, animal health, and the environment, influence the emergence and dissemination of AMR?
3. What information is available about the efficacy of One Health measures in reducing AMR in Kuwait?
Objective:
This systematic review aims to provide a comprehensive AMR analysis of the complex interplay between human, animal, and environmental health sectors over a 15-year period (2009-2024).

Rationale The rationale for conducting this study stems from the urgent global and regional need to address the growing threat of AMR, which compromises public health, animal health, and environmental safety. Kuwait, like many countries in the Gulf region, has witnessed rising antimicrobial usage in both clinical and agricultural sectors, yet a comprehensive evaluation of AMR patterns across human, animal, and environmental interfaces over time remains lacking.

Condition being studied Antimicrobial resistance (AMR) is a significant threat that has far-reaching effects on humans, animals, and the environment. Kuwait has reported an increase in the prevalence of AMR. Yet, the absence of studies that systematically analyze AMR from these domains combined limits our ability to assess the extent of AMR in Kuwait.

METHODS

Search strategy Different key words, antimicrobial resistance, antibiotic resistance, multidrug resistance, resistant pathogens, AMR, one health, interdisciplinary, intersectoral, human health, clinical isolates, animal health, zoonotic, agriculture, farms, environment, water contamination, food chain, soil contamination, were used.

These search terms were combined using Boolean operators (AND, OR).

Participant or population Humans, animals, and the environment.

Intervention Antimicrobial resistance.

Comparator This review does not have any comparator.

Study designs to be included Primary research studies (randomized, observational, experimental, surveillance).

Eligibility criteria
This review has following eligibility criteria:
• Studies included data specifically from Kuwait
• Studies examined antibiotic resistance patterns, prevalence, or transmission
• Primary research studies (randomized, observational, experimental, surveillance)
• Studies examined samples from at least one of the following: human populations, agricultural practices/livestock, or the environment
• Studies included antimicrobial susceptibility or resistance data
• Studies examined more than a single case report
• Studies published between 2009 and 2024
• Studies published in English.

Information sources The electronic databases, such as the Cochrane Library, Google Scholar, Web of Science, PubMed, BioMed Central (BMC), and Scopus, were searched to identify rele-vant AMR studies performed in Kuwait between January 2009 and January 2024. Also, relevant grey literature sources such as government reports and conference pro-ceedings were included to ensure the inclusion of all relevant studies.

Main outcome(s) Antimicrobial resistance status in Kuwait.

Additional outcome(s) Not applicable.

Data management Two independent reviewers used a predefined data extraction Microsoft Excel sheet. They had carefully checked and manged the data.

Quality assessment / Risk of bias analysis The methodological quality assessment was performed by two independent reviewers. The risk of bias in the non-randomized controlled trials (non-RCTs) was assessed using the Risk of Bias In Non-randomized Studies – Interventions (ROBINS-I) tool, and categorized as low, high, and some concerns. The web-based open access tool Robvis was used for visualization and reporting the assessment outcomes. Animal studies were evaluated using SYRCLE and the risk assessment tool, and each study was assessed in the domains of selection, performance, detection, attrition, reporting, and other biases. The environ-mental studies were evaluated using an assessment tool based on the Cochrane risk of bias-2 tool.

Strategy of data synthesis A narrative synthesis will be performed to systematically summarize and interpret the findings from the included studies. The synthesis will involve organizing the studies based on key characteristics such as population, intervention, outcomes, and study design. The results will be presented in structured summary tables to highlight patterns, similarities, and differences across studies. Meta-analysis will be performed using RevMan 5.4. Forest plots will be generated using random effect model at the significance level of 0.05. Heterogeneity level will be calculated using I2 statistic and divided in to three categories, 75% (high).

Subgroup analysis Not applicable.

Sensitivity analysis Not applicable.

Language restriction English.

Country(ies) involved Kuwait.

Other relevant information No additional interests are recorded for this review.

Keywords Antimicrobial resistance; Kuwait; humans; animals; environment; One Health.

Dissemination plans Publishing in peer reviewed journals.

Contributions of each author
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