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INPLASY

Drivers of Antimicrobial Resistance in the Eastern Mediterranean Region: A Systematic Review Protocol

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Khader, Y; Al Nsour, M.

Corresponding author:
Yousef Khader

yskhader@just.edu.jo

Author Affiliation:
Jordan University of Science and Technology.

ADMINISTRATIVE INFORMATION

Support - No specific financial support has been received for this systematic review.

Review Stage at time of this submission - Data extraction.

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 1 May 2026 and was last updated on 1 May 2026.

INTRODUCTION

Review question / Objective This systematic review aims to identify, synthesize, and interpret the drivers of antimicrobial resistance (AMR) in the Eastern Mediterranean Region (EMR). The review examines behavioral, healthcare-related, environmental, governance, economic, and contextual factors contributing directly or indirectly to the emergence, transmission, and persistence of AMR. The review integrates evidence from primary studies and secondary evidence syntheses, including systematic reviews and meta-analyses, to inform context-sensitive policies and interventions.

Rationale AMR is a major global public health threat associated with substantial morbidity, mortality, and economic burden. The EMR faces unique vulnerabilities due to weak antimicrobial stewardship systems, inappropriate antibiotic use, limited diagnostic capacity, conflict, population displacement, and fragmented surveillance systems. Although the literature on AMR in the EMR has expanded considerably, evidence remains fragmented across healthcare, behavioral, environmental, and governance domains. Existing studies and reviews often focus on isolated determinants without adequately examining the interactions between drivers. A comprehensive synthesis integrating evidence across multiple levels and sectors is therefore needed to better understand the complex determinants of AMR in the region and to support evidence-informed policy development and intervention planning.

Condition being studied The condition being studied is AMR, particularly bacterial AMR, within countries of the EMR. AMR occurs when microorganisms develop resistance to antimicrobial agents, reducing the effectiveness of treatment and increasing morbidity, mortality, healthcare costs, and transmission risks. This review focuses on the drivers and determinants contributing to the emergence, selection, spread, and persistence of AMR, including inappropriate antimicrobial use, weak stewardship systems, limited diagnostics, environmental contamination,

governance failures, and One Health-related factors.

METHODS

Search strategy A comprehensive literature search will be conducted in PubMed/MEDLINE, Scopus, Web of Science, and Google Scholar. The search will include studies published between January 1, 2016 and April 30, 2026. The search strategy will combine Medical Subject Headings (MeSH) and free-text terms related to antimicrobial resistance and its drivers. Core search concepts will include "antimicrobial resistance," "antibiotic resistance," "drivers," "determinants," "risk factors," "predictors," "antimicrobial stewardship," "self-medication," "prescribing," "diagnostics," "infection prevention," and "One Health." These terms will be combined with regional descriptors including "Eastern Mediterranean Region," "Middle East," and names of individual EMR countries using Boolean operators (AND/OR). Reference lists of eligible reviews and studies will also be screened to identify additional relevant publications.

Participant or population The review will include studies involving healthcare professionals, physicians, pharmacists, nurses, patients, community members, students, children, policy stakeholders, and populations linked to environmental or animal sectors within countries of the Eastern Mediterranean Region. Studies conducted in hospitals, community settings, pharmacies, primary healthcare facilities, academic institutions, laboratories, and agricultural or animal-related settings will be eligible.

Intervention Not applicable. This review focuses on drivers of antimicrobial resistance rather than evaluating a specific intervention. However, studies examining antimicrobial stewardship programs, infection prevention and control measures, prescribing interventions, and regulatory strategies may be included if they address AMR drivers.

Comparator Not applicable.

Study designs to be included Eligible study designs will include quantitative, qualitative, and mixed-methods primary studies, including cross-sectional, case-control, cohort, retrospective observational, and descriptive studies. Secondary evidence including systematic reviews, scoping reviews, and meta-analyses will also be included. Editorials, commentaries, conference abstracts, and laboratory-only studies without contextual determinants will be excluded.

Eligibility criteria Studies will be included if they were conducted in one or more EMR countries and examined drivers, determinants, or risk factors associated with antimicrobial resistance. Eligible studies must report findings related to antimicrobial use, misuse, prescribing practices, stewardship, infection prevention, diagnostics, governance, environmental factors, or One Health dimensions linked to AMR. Studies reporting only prevalence or susceptibility patterns without examining determinants will be excluded. Laboratory or molecular studies lacking contextual factors, studies outside the EMR, and publication types without sufficient methodological information will also be excluded.

Information sources Electronic databases will include PubMed/MEDLINE, Scopus, Web of Science, and Google Scholar. Additional studies may be identified through screening reference lists of eligible systematic reviews and included studies.

Main outcome(s) The main outcomes will include identified drivers and determinants associated with antimicrobial resistance in the Eastern Mediterranean Region. Outcomes of interest include inappropriate antimicrobial use, self-medication, non-prescription antibiotic access, prescribing practices, stewardship implementation gaps, diagnostic limitations, infection prevention and control weaknesses, environmental contamination, One Health-related factors, governance failures, and socioeconomic barriers contributing to AMR emergence and transmission.

Additional outcome(s) Additional outcomes will include thematic categorization of AMR drivers, geographical variations across EMR countries, implementation barriers to antimicrobial stewardship, gaps in surveillance systems, and identification of evidence gaps related to One Health and fragile settings.

Data management Retrieved records will be screened and managed using standardized screening and data extraction procedures. Data will be extracted into a structured data extraction form including study characteristics, country, setting, study design, participant characteristics, driver domains, mechanisms linking drivers to AMR, and key findings. Screening and data extraction will be independently verified by a second reviewer to ensure consistency and accuracy.

Quality assessment / Risk of bias analysis Given the broad scope of the review and the substantial heterogeneity in study designs, populations, and

outcomes, a formal quantitative risk-of-bias assessment will not be conducted. The review will primarily focus on thematic synthesis and interpretation of evidence across multiple domains of AMR drivers. Findings will be interpreted considering methodological limitations of included studies.

Strategy of data synthesis A narrative synthesis approach will be used due to expected heterogeneity in study designs, settings, and outcomes. Identified AMR drivers will be grouped into predefined domains including behavioral, healthcare-related, environmental, governance, and economic determinants. An inductive thematic analysis will be conducted to identify patterns and interactions across studies. Evidence from systematic reviews will be integrated to contextualize and validate findings from primary studies without duplication.

Subgroup analysis Subgroup analyses will be conducted where sufficient evidence exists according to country, healthcare setting, population type, and driver domain. Particular attention will be given to fragile and conflict-affected settings, community versus hospital drivers, and healthcare versus One Health-related determinants.

Sensitivity analysis Formal quantitative sensitivity analyses are not planned because a meta-analysis will not be conducted. However, findings will be interpreted considering study design heterogeneity, geographical distribution of studies, and differences in methodological approaches across included evidence sources.

Language restriction Studies published in English will be included.

Country(ies) involved Jorda.

Other relevant information This review integrates evidence from both primary studies and secondary evidence syntheses to provide a multi-level understanding of antimicrobial resistance drivers in the Eastern Mediterranean Region. The review adopts a systems-oriented conceptual framework incorporating healthcare, behavioral, governance, environmental, and economic determinants. The findings are expected to support evidence-informed AMR policies, stewardship programs, surveillance strengthening, and One Health implementation in the region.

Keywords Antimicrobial resistance; AMR; Eastern Mediterranean Region; antibiotic stewardship; One Health.

Dissemination plans The findings of this systematic review will be disseminated through publication in a peer-reviewed scientific journal, conference presentations, and sharing with public health stakeholders, policymakers, and antimicrobial stewardship programs in the Eastern Mediterranean Region.

Contributions of each author

Author 1 - Yousef Khader - Author 1 will draft the manuscript, design the review methodology, supervise data synthesis, and approve the final manuscript.
Email: yskhader@just.edu.jo
Author 2 - Mohannad Al Nsour - Author 1 will design the review methodology, supervise data synthesis, and approve the final manuscript.
Email: executive.director@emphnet.net