ECONOMIC COSTING METHODOLOGIES FOR DRUG-RESISTANT BACTERIAL INFECTIONS IN HUMANS IN LOW-AND MIDDLE-INCOME COUNTRIES: A SYSTEMATIC REVIEW

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Introduction

Background

❖Accurate and robust estimates of economic AMR burden are required to ensure generation of reliable and actionable policies.

❖There has been extensive research on the clinical burden of AMR in low and middle-income countries (LMICs) on prevalence and other drivers of antimicrobial resistance.

❖However, comprehensive estimates of economic costs due to AMR in LMICs are limited in part due to lack of standard methodologies.

Study objectives

i. To establish relevant cost variables for economic costing in AMR related infections

ii. To investigate the level of costing and type of infection widely researched in LMICs.

Methodology

Methods

Selection Criteria and Search Strategy

1. Inclusion Criteria

Condition: Economic costing methodologies of drug resistant bacteria infections.

Context: All levels; individual, community, facility, national, and regional but in LMICs.

Population: Human population regardless of age or gender.

Studies: quantitative papers; published or grey literature, written or already translated into English.

2. Exclusion Criterion

➢Reviews e.g. scoping, systematic, meta analysis and commentaries/letters.

Search Strategy

➢Databases and libraries: PubMed, CINAHL, Embase, Cochrane library, global database; global journals online, global index medicus, and grey literature plus search engines (10 to 21 June, 2023.)

➢Boolean operators

Papers screening, Data Extraction and Quality Assessment

➢ Title, abstracts, full texts review and conflicts resolutions done by two independent reviewers in Covidence.
➢ Data extracted using modified Covidence template
➢ Modified JBI quality assessment tool; whether costs and outcomes were measured accurately, valued credibly, adjusted for differential timing, or underwent incremental analysis.

Data Analysis

➢ Papers reviewed on country distribution, frequency of types of AMR infections by country, level of costing and methodologies used to account for various costs.

Results

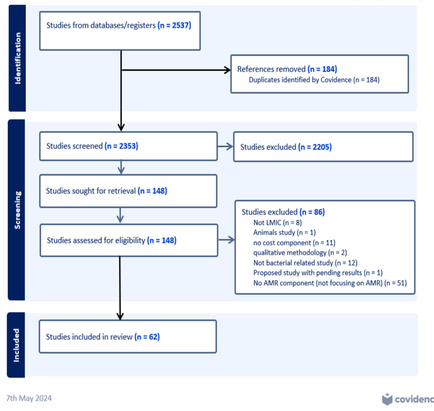


Figure 1: PRISMA diagram

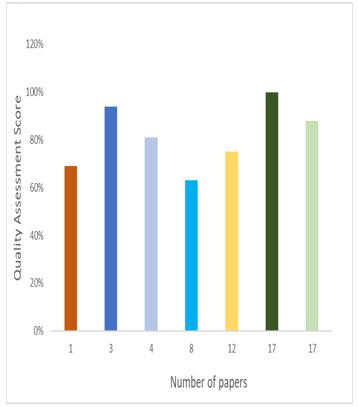


Figure 2: Quality assessment of full texts

Many papers were of good quality for inclusion.

Results…

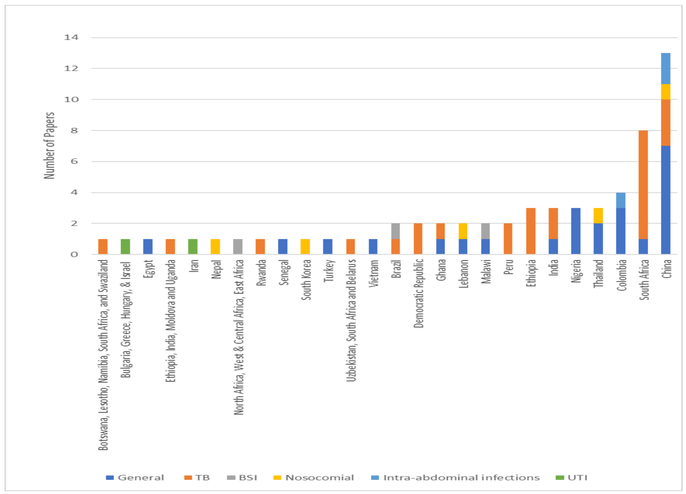


Figure 3: papers distribution by country

China with most papers on general infections , TB was the most common infection investigated (about 40%) in South Africa.

Results…

Commonly Used Cost Variables

➢Patient level: direct costs, non-medical costs and indirect: treatment costs, impact of family employment and income,etc.

➢Health systems level: costs related to drug use, hospital stay, clinic use and diagnostic/monitoring test use, personnel, and equipment costs, etc.

Economic Costing Methodologies

➢ The majority of papers used a micro-costing approach (71%), followed by gross costing (27%), while the remainder used both.

➢ Most studies analyzed costs descriptively (61%) followed by studies using regression-based techniques (17%), and propensity score matching (5%), among others.

Conclusion

➢Findings suggest that the vast majority of studies concerning LMIC settings fail to capture or quantify the full burden deriving from AMR.

➢While descriptive statistics are useful in estimating the economic burden of AMR in selected contexts, they cannot take full account of the complex nature of AMR.

➢On the other hand, regression-based methodologies, which are uncommonly used in LMIC studies, could provide more plausible estimates, but require significant data and resources.

Future Research Direction

➢ Data capture should include wide societal costs in order to account for the full AMR cost burden.

➢Estimation of healthcare system and economic impact costs along with other covariates should include an explanation on how these were measured and where alternative measurement methods exist, explain the suitability of the proposed method in the context

➢Use of more analytical methodologies (for instance descriptive statistics, and regression) should be encouraged if the context may allow in order to triangulate the results of the analysis.

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