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ECONOMIC COSTING METHODOLOGIES OF DRUG RESISTANT BACTERIA INFECTIONS IN LOW-AND MIDDLE-INCOME COUNTRIES: A SYSTEMATIC REVIEW

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ADMINISTRATIVE INFORMATION

Support - SIDA through APHRC.

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 02 July 2024 and was last updated on 02 July 2024.

INTRODUCTION

Review question / Objective i. To assess the justification of using particular AMR infections costing methodologies. ii. To analyse the relevant cost variables for economic costing of AMR infections with regard to patient, provider, and societal perspectives. iii. To investigate factors influencing the choice of economic costing methodologies employed for proper costing of AMR related interventions and health outcomes.

Rationale Without proper methodologies to monetize AMR burden in LMICs that includes economic costs, policy makers are less likely to realize the need to allocate sufficient resources. Arguably, underestimation of economic costs associated with AMR infections due to poor costing methodologies employed by researchers will lead to underestimation of the economic burden of AMR, hence insufficient investment and increased burden.

Condition being studied Economic costing methodologies of (all or any) drug resistant bacteria infections in humans as covered by the papers screened. The study did not limit itself based on causing pathogens or type of illness.

METHODS

Search strategy We searched literature using a predefined protocol for systematic literature reviews. Specifically, we used a Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) model. We used Boolean operators to search the terms for the review. We searched for studies conducted in the low-and middle-income countries region focusing on AMR infections and with an economic costing methodology. The key words used included "antimicrobial resistance", "antibiotic resistance", "multi-drug resistance", "economic costs", "cost evaluation", "cost analysis", "low-and middle-income countries", and "developing countries".

and “less developed countries”. We did not restrict the search for papers by date to have a wider methodological capture. Social sciences and medical databases and libraries included but not limited to PubMed, CINAHL, Embase, Cochrane library, regional database; global journals online, global index medicus, and grey literature.

Participant or population The review only included studies of the human population regardless of age or gender.

Intervention Any AMR related intervention with at least drug resistance component on the infections provided the papers applied costing approaches and or and methodologies to data analysis of AMR related cost data.

Comparator Susceptible groups to antibiotics if reported in the paper, otherwise the case suffice.

Study designs to be included Any design falling under quantitative costing methodology or costing approach.

Eligibility criteria We used five main aspects for the inclusion criteria which were condition, context, population, types of studies, and language as follows:

Condition: we looked at economic costing methodologies of drug resistant bacterial infections.

Context: all levels which encompassed individual, community, facility, national, and regions at least in LMICs.

Population: the review only included studies of the human population regardless of age or gender.

Studies: all quantitative costing papers and economic evaluation studies which used primary or secondary cost data, published or in grey literature. We targeted papers written or already translated into English. The review excluded all systematic and scoping reviews, and commentaries.

Exclusion: qualitative studies and reviews.

Information sources Social sciences and medical databases and libraries included but not limited to PubMed, CINAHL, Embase, Cochrane library, regional database; global journals online, global index medicus, and grey literature.

Main outcome(s) Well guided and robust costing on economic costing methodologies of drug resistant bacteria infections in low-and middle-income countries to take care of timing of costs through discounting for example and resolves confounding. Through eliminated biases,

underestimations (as reported in the face of low resource settings with low quality data) but including indirect costs will eventually lead to most fit policies and investment to combat AMR in nations.

Additional outcome(s) Justification of certain economic approaches to be used in particular contexts and situations to avoid under-reporting of AMR infections' burden which in turn can boost resource allocation from different stakeholders.

Data management Covidence platform for systematic reviews is being used to manage data to screen papers with collaborators independently to avoid bias. Similarly, data extraction and quality assessment will be handled in Covidence online platform for systematic reviews.

Quality assessment / Risk of bias analysis JBI modified checklist for economic evaluations will be used to assess quality. The modification will be based on economic cost measurement of key quality related questions which include whether costs and outcomes were measured accurately, valued credibly, adjusted for differential timing, or underwent incremental analysis.

Strategy of data synthesis Data will be synthesized using PRISMA, graphs and tables to systematically review the costing approaches in order to identify gaps and limitations. The risk of bias in reaching consensus when screening papers will be further checked by the Cohen's Kappa coefficient.

Subgroup analysis We will characterize the papers included in the review by country distribution, the frequency of types of AMR infections by country and the study design. We will categorize the level of costing indicated in the papers on the basis of whether it was done at patient or health system level.

Sensitivity analysis Not applicable, meta analysis would not be applied to costing methodologies.

Language restriction No restrictions, but English language was preferred and efforts were made to translate or find already translated papers if in another language.

Country(ies) involved The study was carried out by searching papers on economic costing in Low and Middle Income Countries (LMICs). The corresponding author is a resident in Malawi.

Keywords Antimicrobial resistance, Economic costs, Costing Methodologies.

Dissemination plans Paper publication with peer reviewed journal. Priority is Health Economics Review journal and PLOS One. Workshops and conferences targeting Ministry of Health officials, health practitioners, researchers, and policy makers will follow.

Contributions of each author

Author 1 - Edward Masoambeta - Author was part of paper screening, data extraction, quality assessment, and writing the protocol and manuscript.

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