

Cost-effectiveness of Colorectal Cancer screening strategies in Low- and Middle-Income Countries: A Systematic review and Meta-analysis.

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INTRODUCTION

- Colorectal cancer (CRC) is a leading cause of global cancer mortality, with a rising incidence in low- and middle-income countries (LMICs).
- Screening effectively reduces the burden of CRC, and several studies in high-income countries have proven that CRC screening strategies are cost-effective.
- Limited economic evaluations from LMICs hinder evidence-based policy making in these settings.

OBJECTIVE

- To evaluate the information on cost-effectiveness by pooling incremental net benefits (INBs) of each level of income country of new strategies compared to traditional strategies for CRC screening strategies.

METHODS

Eligible Criteria

- P** Average-risk adults aged >40 years without prior history of cancer or metastatic CRC.
- I** Any kinds of relevant CRC screening interventions (both invasive and non-invasive)
- C** Any relevant comparators
- O** Any kind of relevant outcomes (ex. incremental cost-effectiveness ratio)
- S** Low- and middle-income countries classified according to the World Bank classifications 2025.
Full economic evaluation; cost-minimization analysis, cost-benefit analysis, cost-effectiveness analysis, and cost-utility analysis

- Databases** : PubMed, EMBASE, Scopus, INAHTA databases, and Tufts CEA registry
- Search Period** : Inception to June 2026
- Currency** : All cost were converted to purchasing power parities in US dollars (\$PPP), in 2025.

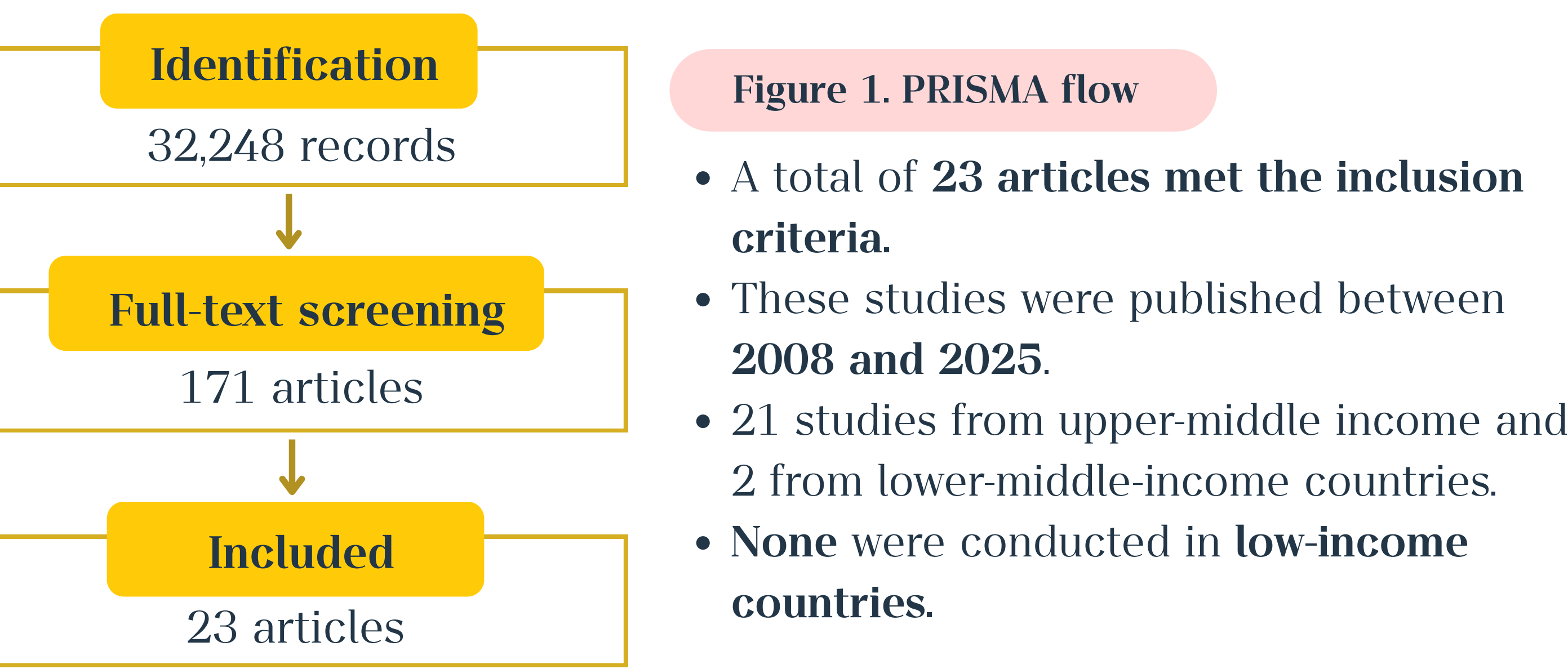
Data Extraction and Quality Assessment

- All information from the included studies were **extracted independently** by two reviewers (IK and JJ), with any disagreements resolved through discussion with the other reviewer (LW).
- The **quality** of the included studies were accessed by **ECOBIAS Checklist**.

Statistical Analysis

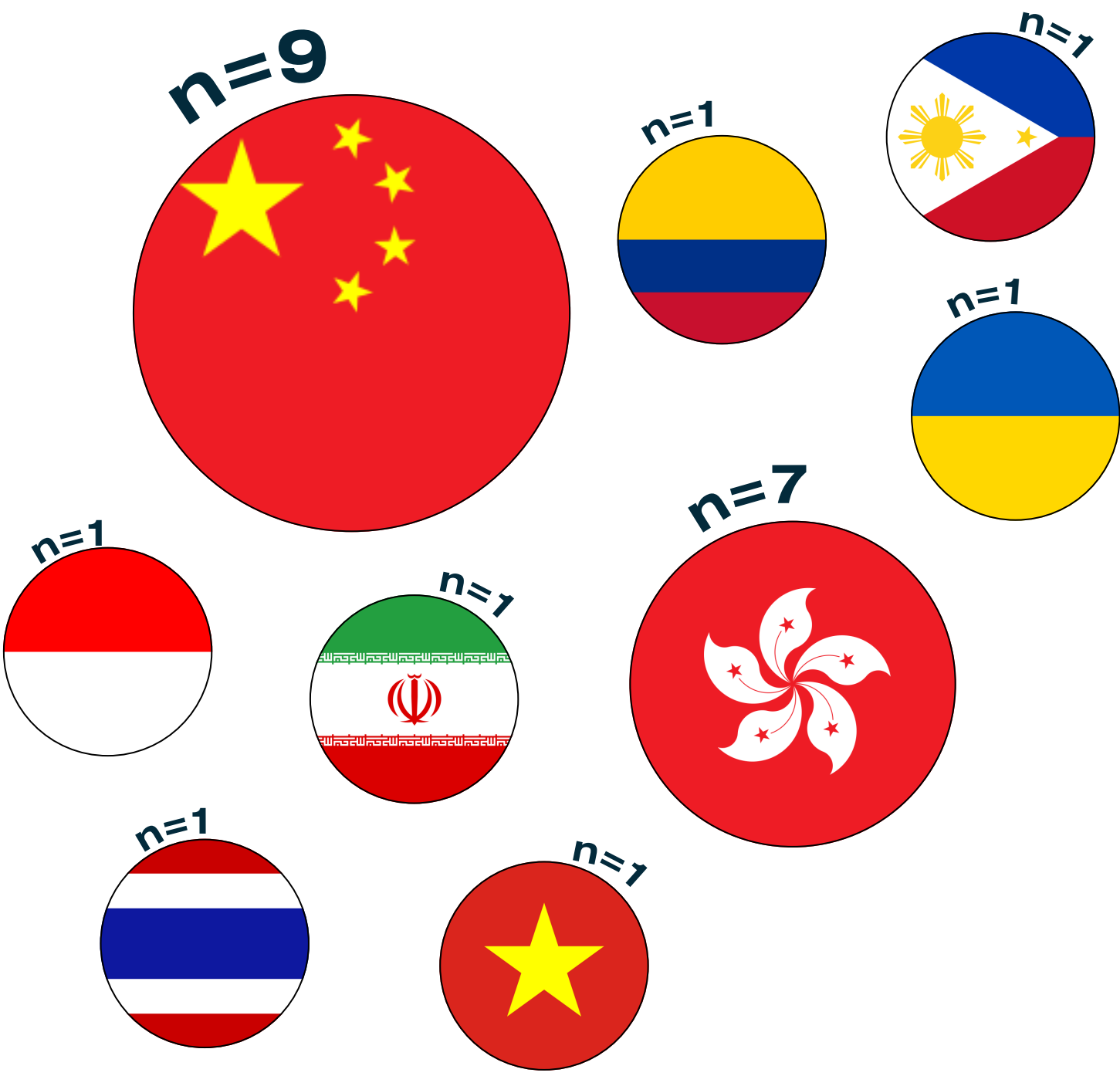
- A **meta-analysis** using a random-effects Empirical Bayes model was conducted to pool INBs across World Bank income levels.
- Evaluated potential sources of heterogeneity using **subgroup analyses** and assessed publication bias via **funnel plots**.

RESULTS



Characteristics of included studies

- 1 study was assessed as having a moderate quality, whereas 22 studies were rated as high quality studies.



Target population :

- Majority of studies started screening at age 50, the youngest initial screening age observed was 40.

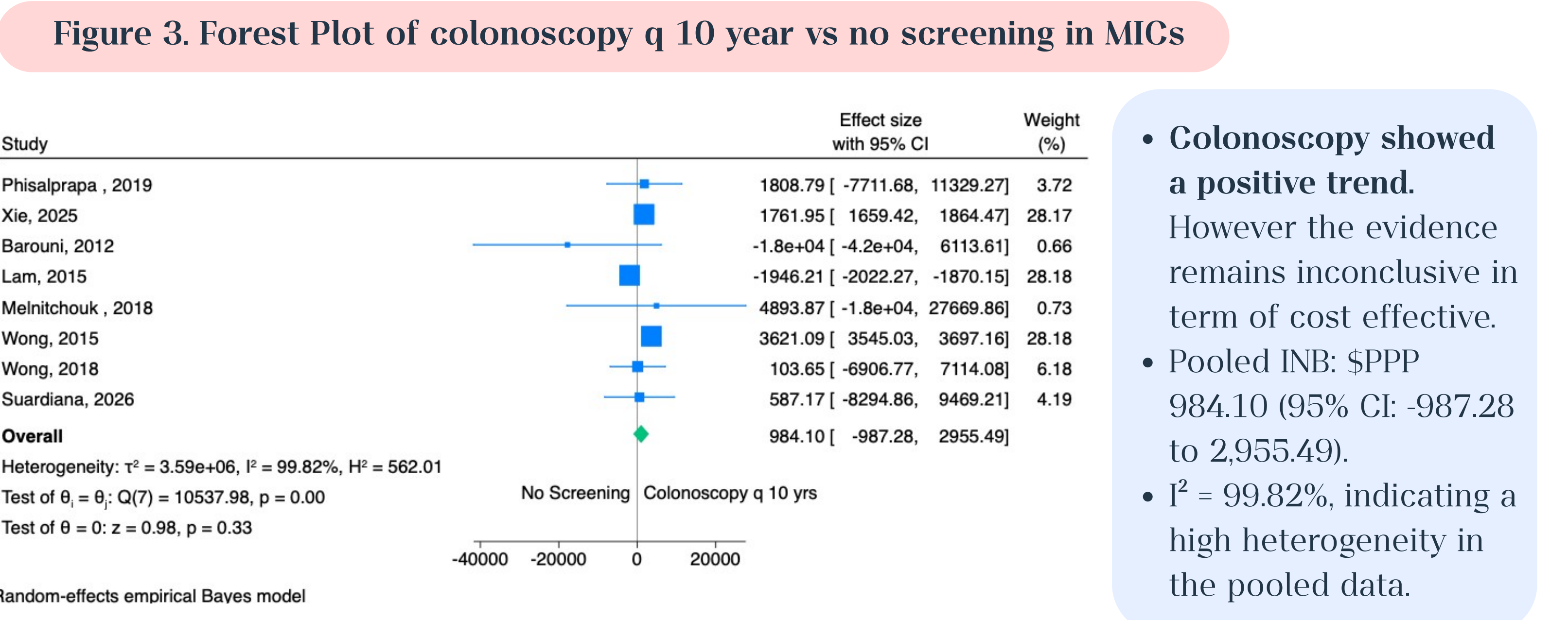
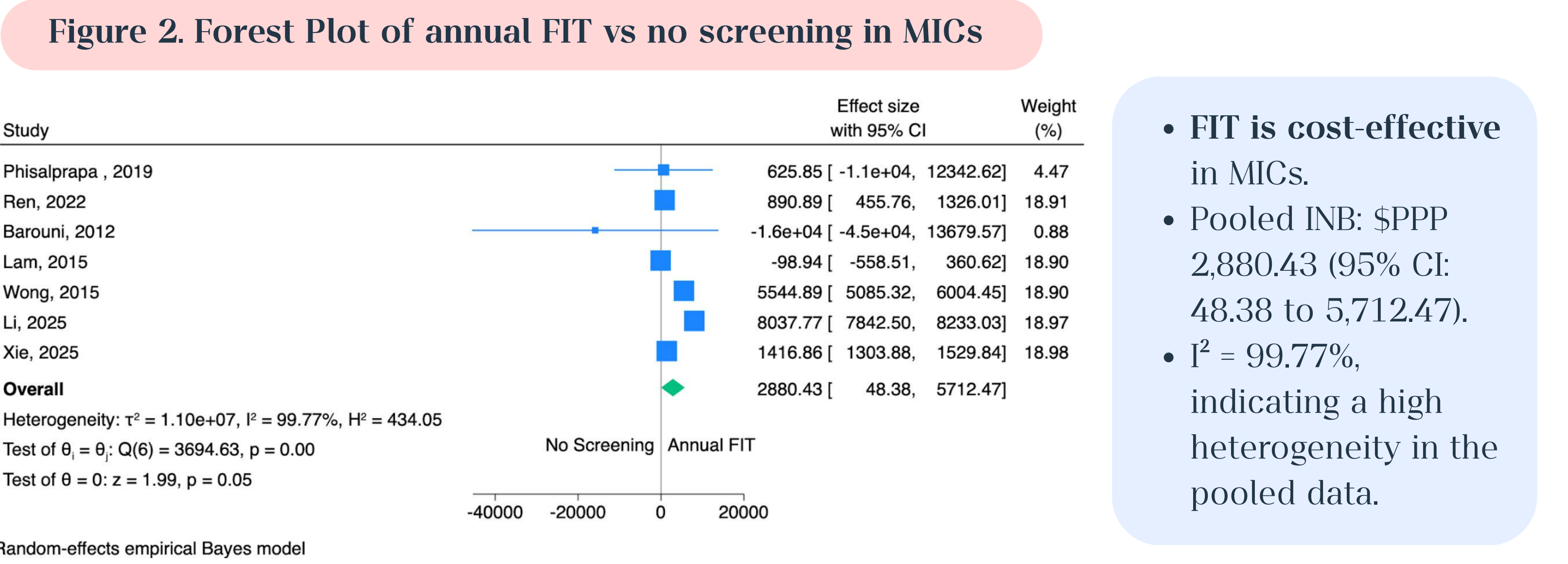
Non-invasive intervention :

- Fecal Immunochemical Test (FIT) (n=12)
- Guaic-Based Fecal Occult Blood Test (n=9)
- Multi-target stool DNA-based screening (SDC2, ADHFE1 and PPP2R5C)
- Questionnaire
- Combined methods ex. Questionnaire + FIT

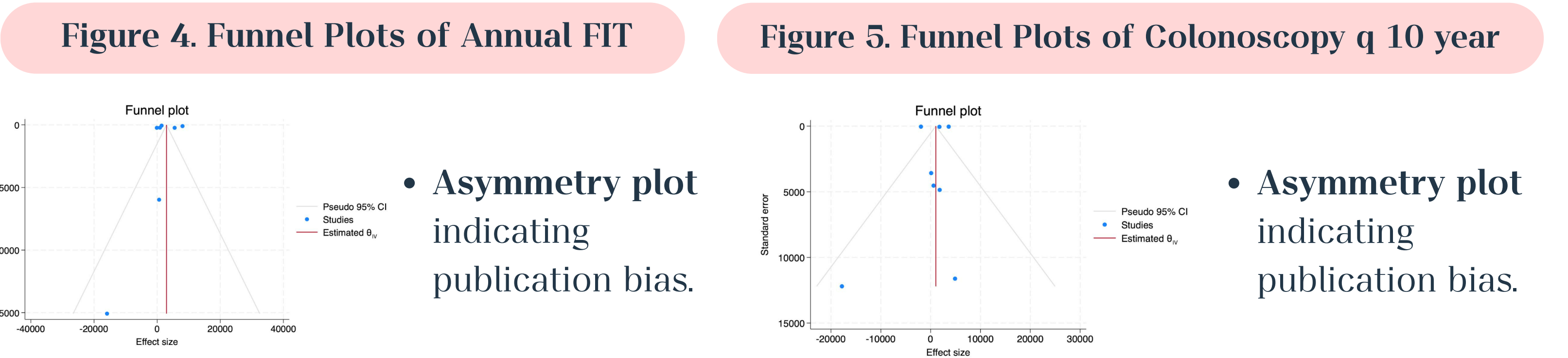
Invasive intervention :

- Colonoscopy (n=15)
- Sigmoidoscopy (n=4)
- AI-assisted colonoscopy
- CT colonoscopy
- Combined methods ex. FIT + AI-assisted colonoscopy

INB Results



Publication Bias Results



CONCLUSION

- In MICs, **Annual FIT is a cost-effective** method compared to no screening, While **colonoscopy q 10 year may consider as a promising intervention** compared to no screening. However, transferability of our finding should approach by country specific affordability and accessibility.
- Multi-target stool DNA testing and AI-assisted colonoscopy** have emerged as new screening methods in recent years.

ACKNOWLEDGEMENT

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