Health
Decision

ABSTRACT

The parameter variation of one-way sensitivity analysis in economic evaluation: Global systematic review

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Objective: One-way sensitivity analysis (OSA) plays a crucial role in economic evaluations (EEs), yet knowledge about parameter range and research practices is limited. Understanding these patterns is essential for reliable healthcare decision-making. This study aims to describe OSA patterns in EEs, providing insights into parameter ranges and good research practices.

Methods: Systematic searches on PubMed, MEDLINE, Embase, and ScienceDirect were conducted for model-based EEs published in English (2021-2023). Neoplasm-related articles were prioritized due to their abundance. Screening, data extraction, and quality assessment were performed by two independent reviewers. Study characteristics, OSA methods, and OSA result diagrams were collected. Study quality was assessed using the Criteria for Health Economic Quality Evaluation (CHEQUE) tool.

Results: Among 7,885 records, 362 articles were extracted. Economic parameters such as price per unit, packaging cost, and number of healthcare utilization were commonly varied in OSA (94%). Efficacy parameters (84%), utility parameters (79%), and safety parameters related to adverse event and complication (54%) were also frequently varied. Only 67% of the articles described parameter variation methods, 73% listed parameter change ranges, and only 34% explicitly stated the rationale behind parameter variations. A taxonomy of OSA range types was developed, including practices such as literature review, confidence intervals, practical context, clinical opinion, extreme values, percentage/distance variations, guideline provisions, author assumptions, unknown ranges/types, uncertain variations, and others. Good practices for OSA were recommended. Tornado diagrams were the most common OSA result plots (88%), accompanied by table, curve, and line chart. Method quality scored 13 out of 18 points, while reporting quality scored 12 out of 17 points.

Conclusion: This systematic review revealed unsatisfactory quality in the methods and reporting of OSA in neoplasm EEs. Recommendations are provided for parameter variation methods, ranges, references, and chart presentation for future OSA studies.

Key words: parameter variation, one-way sensitivity, systematic review, economic evaluation