Health
Decision

ABSTRACT

Current practices of model validation in economic evaluation: A systematic review in neoplasms

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ABSTRACT

Objective: Model validation is crucial for ensuring confidence in economic models, and guidelines emphasize the need for researchers to validate the pharmacoeconomic models they construct. This systematic review summarizes current practices and challenges in model validation for neoplasm economic evaluations, providing recommendations for improvement.

Methods: Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, we searched PubMed, MEDLINE, Embase, and ScienceDirect for model-based economic evaluations published between 2021 and 2023. The studies were screened and extracted by two researchers independently. The frequency of each model validation type was assessed, along with descriptions of specific practices, validation outcomes, and adjustments made based on the validation results.

Results: Among the final 362 articles, 139 (38%) conducted model validation. External validation was the most commonly used validation method (47%), calibrating the model and comparing simulated outcomes with real-world evidence. Face validation (45%) relied on insights from clinical experts and economists. Internal validation (19%) employed tools such as the incremental mixture importance sampling (IMIS) algorithm and TreeAge. Cross validation (9%) compared data from similar events, while predictive validation (4%) used long-term follow-up data. Of the 39 studies (28%) that reported validation results, none of them made any adjustments based on the validation outcomes. The Assessment of the Validation Status of Health-Economic decision models (AdViSHE), a validation-assessment tool, was utilized in three studies for model validation. Additionally, 10% of economic evaluations lacked clear validity, while 96% had one to three validity dimensions, and only 4% had four to five dimensions.

Conclusion: Most studies had limited and brief model validation practices without comprehensive descriptions. Researchers are encouraged to employ multiple validation methods and provide detailed descriptions of their validation practices, results, and adjustments. Active development and utilization of model evaluation tools should be promoted among scholars.

Key words: model validation, economic evaluation, current practices, systematic review