



METHODOLOGICAL QUALITY OF BUDGET IMPACT ANALYSES FOR ORPHAN DRUGS: AN UPDATED REVIEW*

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BACKGROUND AND OBJECTIVES

Orphan drug spending surpassing total pharmaceutical expenditure trends is increasingly pressurizing limited health care resources globally. **Budget impact analysis** offers health authorities a way to **predict fiscal feasibility and sustainability** of adopting a new **orphan drug** within their jurisdiction. However, budget impact analyses of orphan drugs in reimbursement procedures **lack transparency**.

This study aims to (1) update on the **evaluation of the methodological quality of budget impact analyses** for orphan drugs with (2) **suggestions for future enhancements** of accuracy and reliability.

METHODS

- **Conference abstracts and peer-reviewed articles** retrieved from Pubmed and Embase up to January 2020
- **ISPOR good practice guidelines** on budget impact analyses for **quality assessment** of following parameters;
 - perspective
 - scope of costs
 - target population
 - discounting
 - time horizon
 - validation
 - intervention and comparator(s)
 - data sources
 - assumptions and sensitivity analysis

RESULTS

Adherence percentages of studies (n=91) to ISPOR criteria on budget impact analyses for individual (77%) and combination (23%) of orphan drugs. †

<p style="text-align: center;">Perspective</p> <p>Of</p> <ul style="list-style-type: none"> • budget holder (89%): 79% third-party payer 10% hospital, pharmacy, patient • society: 1% <p>only 4% with more than one perspective</p>	<p style="text-align: center;">Target population</p> <ul style="list-style-type: none"> • Open system (dynamic): 20% • Closed system (static): 44% <p>→ sources: assumptions 41%, claims database 8%</p>	<p style="text-align: center;">Time horizon</p> <p>Of</p> <ul style="list-style-type: none"> • 1 to 5 years: 87% • >5 years: 13% <p>Budget impact results depicted as</p> <ul style="list-style-type: none"> • periods (monthly/annually): 87% • one net value: 12%
<p style="text-align: center;">Intervention and comparator(s)</p> <p>Market uptake of intervention</p> <ul style="list-style-type: none"> • expansion 54% • substitution 18% • combination 9% <p>one or more comparators: 90% → sources: company 24%, registries 16%</p>	<p style="text-align: center;">Assumptions and sensitivity analysis</p> <p>All studies require assumptions with most on</p> <ul style="list-style-type: none"> • population size: 65% • other drug-related 38% • market uptake 48% <p>and sensitivity analyses</p> <ul style="list-style-type: none"> • deterministic univariate 37% • probabilistic 1% • not reported or unclear: 62% 	<p style="text-align: center;">Scope of costs</p> <p>All studies included drug-only costs with only</p> <ul style="list-style-type: none"> • 52% condition-related costs • 3% indirect costs <p>→ sources: registries 24%, claims database 12%</p>
<p style="text-align: center;">Discounting</p> <p>Budget calculations</p> <ul style="list-style-type: none"> • not discounted: 95% • discounted: 5% <p>→sources: assumptions 1%, public literature 1%</p>	<p style="text-align: center;">Validation</p> <p>Budget impact framework</p> <ul style="list-style-type: none"> • not validated: 88% • validated: 22% <p>(through experts, data sources, similar studies or statistical analyses)</p>	<p style="text-align: center;">Data sources</p> <ul style="list-style-type: none"> <li style="width: 50%;">• assumptions 79% <li style="width: 50%;">• other setting 40% <li style="width: 50%;">• experts 19% <li style="width: 50%;">• claims database 41% <li style="width: 50%;">• literature 49% <li style="width: 50%;">• registries 44% <li style="width: 50%;">• historical data 21% <li style="width: 50%;">• company 36% <li style="width: 50%;">• market research 16%

†Parameter percentages do not always add up to 100% due to; unreported data, multiple criteria in same study and only two most common sources depicted for target population, intervention and comparator(s), discounting and scope of costs.

RECOMMENDATIONS

- Improving future budget impact analyses of orphan drugs by;
- Adopting **one or more perspective(s)** and motivating their choice(s).
 - Adequately comparing **intervention with and without alternative**.
 - Accounting for influx and efflux of patients within a **dynamic population**.
 - Consistently considering both **drug-costs and condition-related costs**.
 - Determining uncertainty of assumptions by **exhaustive sensitivity analyses**.
 - **Validating the framework** by external experts, statisticians and/or former studies.
 - Systematically **collecting and publishing required data for such analyses**.

CONCLUSION

Existing budget impact analyses for orphan drugs are concise, vary greatly and of **substandard methodological quality**.

To eliminate concerns on bias of such analyses, **future studies should adhere to standardized** methodologies of systematic **guidelines** (i.e. national or ISPOR guidelines).