



School of Public Health

Who's next? The impact of ranked substitution on budget impact model uncertainty.

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Background

 Budget Impact Analyses (BIA) estimate financial implications of new interventions or changes in the treatment mix on healthcare budgets¹

Results

 The developed framework maps the most likely market shares and associated budget impacts within the defined parameter space, incorporating decision-makers' prefer-

- In a two-intervention scenario, uncertainty in BIA mainly stems from predicting the intervention's future market share
- In multi-intervention scenarios, an additional source of uncertainty arises from determining which treatments will be substituted and in what sequence
- Current guidelines typically address this uncertainty deterministically²
- We propose a probabilistic framework to quantify uncertainties in both market share predictions and substitution sequences

Methods

 We defined a parameter space where boundaries are set by the gradual substitution of interventions, from most to least expensive, and least to most expensive

ences for substitution

- Calculations were based on an assumed population of 100,000 individuals
- Mean estimated market share: 40.32%
- 90% of all estimated market shares fall within the interval between 33.14% and 46.21%
- Mean estimated budget impact: -8,932,904 €
- 90% of all estimated budget impacts fall within the interval between –10,828,622 € and –6,564,156 €

Table 1: Heatmap of most likely market share and budget impact



- Within these boundaries, treatment options have different likelihoods of being substituted
- A hypothetical BIA was conducted, including ten therapies, to estimate the budget impact across different market shares
- Expected market share replacement estimates were derived from beta distributions
- substitution sequences were Expected determined through random permutations with weighted probabilities
- Monte Carlo simulation (500,000 iterations) quantified probable outcomes

Conclusions

 Engaging industry stakeholders is critical to assess the applicability and refinement of this model as a complement to BIA guidelines

Practical challenges include availability and validity of data

• Further consideration: modelling potential dependencies between treatments in the substitution sequence

References

¹ Sullivan, S. D., Mauskopf, J. A., Augustovski, et al. (2014). Budget impact analysis—principles of good practice: report of the ISPOR 2012 Budget Impact Analysis Good Practice II Task Force. Value in health, 17(1), 5-14. ² Foroutan, N., Tarride, J. E., Xie, F., & Levine, M. (2018). A methodological review of national pharmaceutical budget impact analysis guidelines for new drug submissions. *Clinicoeconomics and Outcomes Research*, 821-854.

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