A Systematic Review and Meta-Analysis of Factors Affecting Health Technology Assessments in Healthcare

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Background and objective

- Health technology assessment (HTA) dated from the late 1970s, when the expansion of technology and growth in healthcare costs began to attract the attention of decision-makers. [1]
- An increasing number of researchers have conducted empirical studies by analysing the past HTA decisions using multivariable methods to identify the preferences of decision-makers.
- However, only few studies have reviewed the findings of these quantitative studies.
- Against this background, this study aimed to provide an overview of the direction and magnitude of different factors impacting HTAs in healthcare.

Method

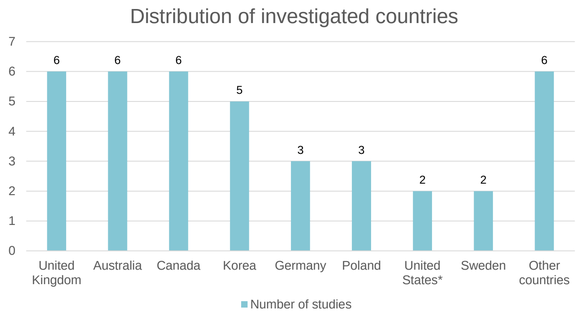
- A systematic literature review was performed by searching Ovid Medline and Embase from their inception to 2 July 2020.
- Studies were selected based on the following inclusion and exclusion criteria:

Inclusion and exclusion criteria	
Inclusion criteria	1) Studies that conducted the multivariable analysis of previous HTA related decisions 2) Studies published in English
Exclusion criteria	1) Studies that only performed the descriptive or univariable analyses of HTA decisions 2) Studies that pooled decisions from the agencies in different countries

- The following data were extracted by two researchers independently:
  - Characteristics of included studies: author, year of publication, country, studied agency and sample size
  - Modelling methods and results: definitions of factors and modelling outputs
- The factors were divided into four categories: 1) disease-related factors, 2) technology-related factors, 3) clinical outcome-related factors, and 4) economic outcome-related factors.
- The factors were considered as the “core” factors if they were investigated in at least a quarter of included agencies and meta-analyses were conducted for them.
- The meta-analysis on core factors was performed using R software version 4.0.3.

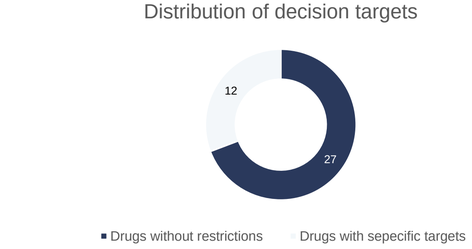
Result

- Thirty-nine studies were identified, including 7,696 decisions from 15 HTA agencies.
- Among these studies, the HTA decisions from the United Kingdom (n=6), Australia (n=6), and Canada (n=6) were mostly investigated.



* There is no formal HTA agency in the United States. These two studies analysed coverage decisions from the Centres for Medicare and Medicaid Services (CMS) in the United States.

- Most studies (n=27) have no limitations on specific drug targets for decisions, while 12 studies focused on the decisions for specific targets, among which the most studied target was oncology disease (n=7).



- Eleven factors were identified as core factors as they were investigated in more than 4 agencies.

Core factors	
Disease related-factors	**Technology related-factors**
• Severity of disease • Absence of alternatives	• Innovation level • Type of indication • Type of technology
Clinical outcome related-factors	**Economic outcome related-factors**
• Comparative efficacy • Type of comparator • Quality of clinical evidence • Acceptance of clinical evidence	• Incremental cost-effectiveness ratio • Budget impact

- Among them, three factors were identified as the significant factors for decision-making in over half of the investigated agencies: superior comparative efficacy and accepted clinical evidence as the positive factors, and high incremental cost-effectiveness ratio (ICER) as a negative factor.
- The 11 core factors were analysed by meta-analysis further by pooling the decisions from different agencies. Seven factors were identified as significant factors.

Summary of meta-analysis results	
Positive factors	• Absence of alternatives • Superior comparative efficacy • Active comparator • High quality of clinical evidence • Accepted clinical evidence
Negative factors	• Oncology indication • High ICER
Not significant factors	• Severity of disease • Innovation level • Type of technology • Budget impact

Odds ratios (95% CI) for the core factors		
Severity of disease	High vs low	0.68 (0.44,1.04)
Absence of alternative	Yes vs no	1.59 (1.13,2.24)
Innovation level	High vs low	0.47 (0.22,1.02)
Type of indication	Oncology vs others	0.58 (0.45,0.75)
Type of technology	Orphan drugs vs others	0.60 (0.36,1.01)
Comparative efficacy	Superior vs not superior	3.47 (1.7,7.08)
Type of comparator	Active vs placebo	2.17 (1.46,3.25)
Quality of clinical evidence	High vs low	4.15 (1.44,11.95)
Acceptance of clinical evidence	Accepted vs not accepted	23.31 (6.02,90.23)
Incremental cost-effectiveness ratio	High vs low	0.18 (0.06,0.55)
Budget impact	High vs low	0.45 (0.15,1.42)

CONCLUSIONS

Despite the different reimbursement systems, comparative efficacy, accepted clinical evidence and high incremental cost-effectiveness ratio are mostly identified as important factors across the different agencies. The impacts of factors reflecting the equity principle, such as disease severity and orphan drugs, are limited especially in the agencies which emphasize the criterion of cost-effectiveness.

REFERENCES
1. Jonsson E et al. Int J Technol Assess Health Care. 2002; 18: 218-237.
2. Vuorenkoski L et al. Health Policy. 2008; 86: 1-9. 2007/10/24.
3. Fischer KE et al. Health Policy 2012; 107: 218-230.
4. Ghijben P et al. Pharmacoeconomics 2018; 36: 323-340.