Infographic

Health economic evaluation in noninvasive brain stimulation: an infographic

Fuad Ahmad Hazime[1]
Raquel Sales Rocha-Jacob[2]
Suhaila Mahmoud Smaili[3]
Igor Garcia Barreto[4]
Abrahão Fontes Baptista[5]
Katia Nunes Sá[6]

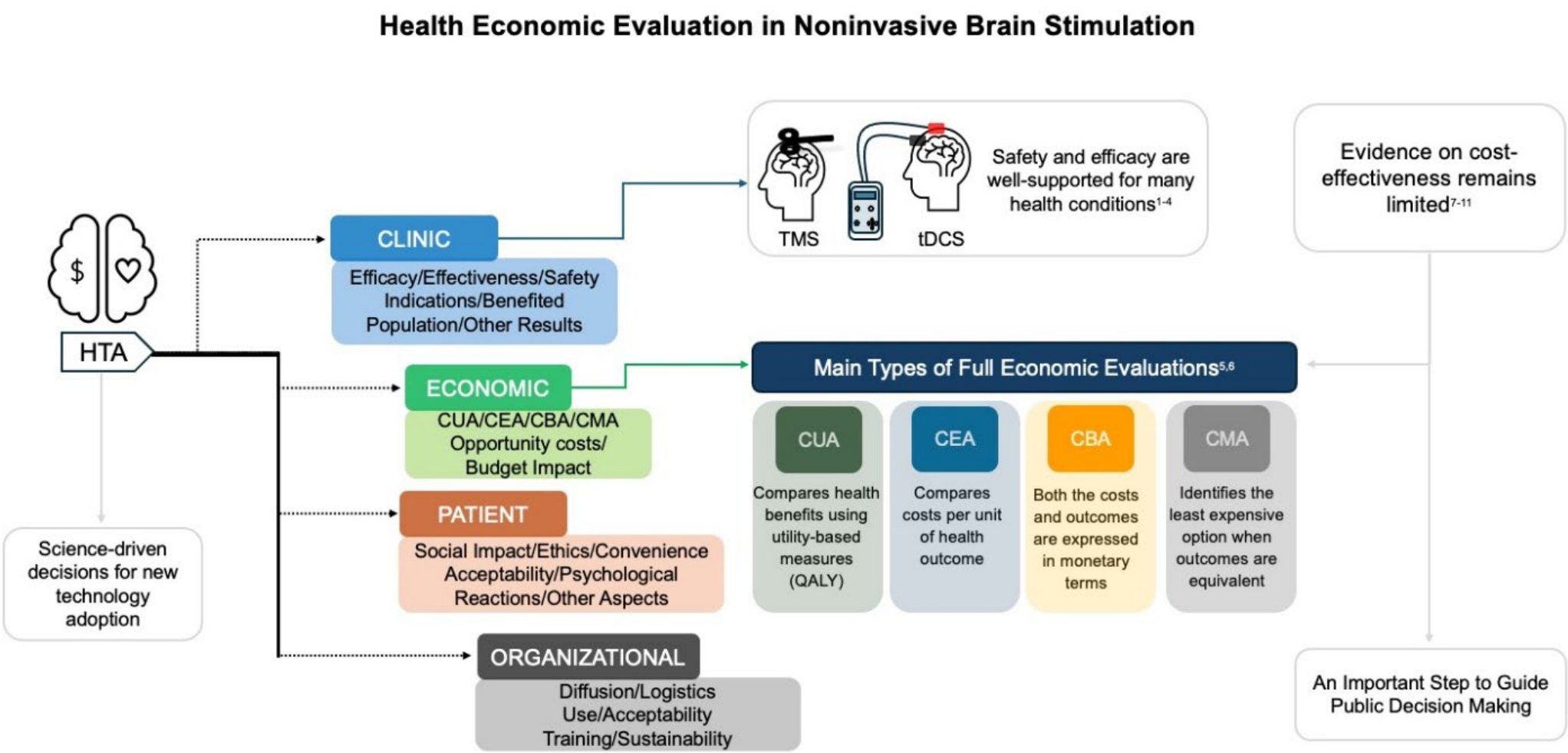
[1]Corresponding contact. Universidade Federal do Delta do Parnaíba (Parnaíba). Piauí, Brazil. Núcleo de Assistência e Pesquisa em Neuromodulação (NAPeN network). Brazil. fuad@ufdpar.edu.br
[2]Universidade Estadual de Londrina (Londrina). Paraná, Brazil. Núcleo de Assistência e Pesquisa em Neuromodulação (NAPeN network). Brazil.
[3]Universidade Estadual de Londrina (Londrina). Paraná, Brazil.
[4,6]Escola Bahiana de Medicina e Saúde Pública (Salvador). Bahia, Brazil. Núcleo de Assistência e Pesquisa em Neuromodulação (NAPeN network). Brazil.
[5]Universidade Federal do Rio de Janeiro (Rio de Janeiro). Rio de Janeiro, Brazil. Núcleo de Assistência e Pesquisa em Neuromodulação (NAPeN network). Brazil.

ABSTRACT | BACKGROUND: The use of non-invasive brain stimulation (NIBS) techniques to treat various health conditions is now well established in many countries. Essential considerations for adopting any new health technology – including safety, efficacy, and effectiveness – have been extensively studied and supported by published research and expert consensus. However, while NIBS has overcome many safety and efficacy barriers for numerous conditions, evidence regarding its cost-effectiveness remains limited. **OBJECTIVES:** This infographic presents the principal types of full economic evaluations applicable to NIBS interventions. **METHODS:** Its design aligns with methodological standards for health economic studies and incorporates guidelines from key policy institutions, including the Brazilian Ministry of Health. **RESULTS:** The evaluation of costs and benefits associated with NIBS plays a crucial role in health technology assessments and decisions regarding its integration into healthcare systems. From a patient's perspective, cost-effective innovations expand treatment options, particularly for chronic or refractory conditions, while improving access through reimbursement and insurance coverage. From a health economic viewpoint, these evaluations are vital to ensure efficient resource allocation and prevent investment in clinically or economically unjustified treatments. Full economic evaluations can be categorized into cost-minimization analysis (CMA), cost-effectiveness analysis (CEA), cost-utility analysis (CUA), and cost-benefit analysis (CBA). **CONCLUSION:** Economic evaluation is a cornerstone of health technology assessment (HTA), providing critical evidence to guide decisions about adopting new technologies in public healthcare. For noninvasive brain stimulation (NIBS) – including repetitive Transcranial Magnetic Stimulation (rTMS) and Transcranial Direct Current Stimulation (tDCS) – current evidence reveals a significant gap in cost-effectiveness analyses. Future studies should adhere to methodological guidelines and regional priorities to strengthen the evidence base, ultimately supporting the integration of these interventions into public health systems.

KEYWORDS: Non-invasive Brain Stimulation. Technology Assessments. Economic Health Evaluation. Cost-effectiveness Analysis.

Submitted Apr. 30th, 2025, Accepted Aug. 5th, 2025,
Published Oct. 6th, 2025
Brain Imaging Stimul., Salvador, 2025;4:e6222
https://doi.org/10.17267/2965-3738bis.2025.e6222 | ISSN: 2965-3738
Assigned editor: Adriana Oda

How to cite this article: Hazime FA, Rocha-Jacob RS, Smaili SM, Barreto IG, Baptista AF, Sá KN. Health economic evaluation in noninvasive brain stimulation: an infographic. Brain Imaging Stimul. 2025;4:e6222. https://doi.org/10.17267/2965-3738bis.2025.e6222


Health Economic Evaluation in Noninvasive Brain Stimulation
HTA
Science-driven decisions for new technology adoption
CLINIC
Efficacy/Effectiveness/Safety
Indications/Benefited Population/Other Results
TMS
tDCS
Safety and efficacy are well-supported for many health conditions[1-4]
ECONOMIC
CUA/CEA/CBA/CMA
Opportunity costs/
Budget Impact
PATIENT
Social Impact/Ethics/Convenience
Acceptability/Psychological Reactions/Other Aspects
ORGANIZATIONAL
Diffusion/Logistics
Use/Acceptability
Training/Sustainability
Main Types of Full Economic Evaluations[5,6]
CUA
Compares health benefits using utility-based measures (QALY)
CEA
Compares costs per unit of health outcome
CBA
Both the costs and outcomes are expressed in monetary terms
CMA
Identifies the least expensive option when outcomes are equivalent
Evidence on cost-effectiveness remains limited[7-11]
An Important Step to Guide Public Decision Making

Infographic legend

HTA: Health technology assessment; CUA: Cost-utility analysis; CEA: Cost-effectiveness analysis; CBA: Cost-benefit analysis; CMA: Cost-minimization analysis; QALY: Quality-adjusted life years.

Authors' contributions

The authors declared that they have made substantial contributions to the work in terms of the conception or design of the research; the acquisition, analysis or interpretation of data for the work; and the writing or critical review for relevant intellectual content. All authors approved the final version to be published and agreed to take public responsibility for all aspects of the study.

Competing interests

No financial, legal, or political conflicts involving third parties (government, private companies, and foundations, etc.) were declared for any aspect of the submitted work (including but not limited to grants and funding, advisory board participation, study design, manuscript preparation, statistical analysis, etc.).

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