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# The underreporting of cost perspective in cost-analysis research: A systematic review of the plastic surgery literature



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## KEYWORDS

Cost;  
Ethics;  
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Healthcare costs

**Summary Background:** Cost-analysis research can influence healthcare policies and practices. There is inherent bias depending on the chosen cost perspective (hospital, third-party payer, societal), and conclusions can change based on the perspective used. These perspectives may or may not be well declared or justified when performing cost-analysis research. The goal of this study was to perform a literature review of cost-analysis research in the Plastic Surgery literature to determine the prevalence of studies declaring and justifying their perspective, and to inform the reader on why such declarations are important in understanding potential bias.

**Methods:** A systematic review was completed to retrieve cost-utility and cost-effectiveness research within the scope of Plastic Surgery. The search was limited to English-language studies in North America and Europe published between 2006 and 2016. Articles were selected using predefined data fields and specific inclusion criteria.

**Results:** A total of 2304 abstracts were identified, of which 47 met inclusion criteria. Seventy-two percent of studies (n = 34) declared a cost perspective. Of the studies that identified a cost perspective, 32% incorrectly identified the cost perspective. Only 49% of all studies (n = 23) both accurately declared and justified their chosen perspective.

**Conclusions:** Only half of studies correctly declare their cost perspective and justify why the perspective was chosen. Not doing so potentially hides bias from the reader. Future efforts when performing cost-analysis studies should require a clear declaration and justification of the cost perspective taken. A table of our recommendations for reporting cost perspective is provided. © 2017 British Association of Plastic, Reconstructive and Aesthetic Surgeons. Published by Elsevier Ltd. All rights reserved.

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## Background

Healthcare costs are rising in many healthcare systems. Both the United States and British healthcare systems while different are interested in finding value in healthcare choices. There has been a relatively new area of research in medicine that began with strict cost-analysis comparing the potential cost savings of one medical technique or technology to an equivalent competitor technique or technology. While this provided important information, it failed to truly investigate the clinical qualities and outcomes for the competing techniques or technologies which physicians prioritize to provide optimal healthcare to their patients.

To better compare not only the costs but also the clinical outcomes between competing techniques, cost-analysis research further evolved into cost-effectiveness/utility research, which acknowledged the importance of clinical outcomes using quality adjusted life years (QALYs) in addition to cost.<sup>1-3</sup> Subsequently, there has been an increasing number of cost-effectiveness and cost-utility studies in the surgical literature and several articles have emphasized the importance of this research,<sup>4,5</sup> particularly in the field of plastic surgery.<sup>6,7</sup> This type of research has the potential to influence choice of intervention because it incorporates both the cost and the quality of life gained, and conclusively identifies one approach to be cost-effective when compared to another.

Plastic surgery is often criticized for high-cost interventions that have little impact on length of life. And while plastic surgery interventions can prolong life in certain circumstances, the most profound impact to our patients is often an improvement in quality of life. Because cost-utility research measures quality of life (with QALYs), rather than simply length of life, the significant impact of plastic surgery interventions can be appropriately identified and accounted for. This point should not be underestimated. As healthcare costs continue to rise and policy makers continue efforts to cut unnecessary spending, cost-utility studies have the potential to demonstrate the value of plastic surgery interventions. Costs may be measured from different perspectives (hospital, third-party payer, societal, patient), and the costs for a given procedure can vary depending on the perspective taken. For example, if one considers repairing a ventral hernia using a component separation flap technique with or without mesh, the costs from a hospital perspective would be less for performing the component separation without mesh than it would be if mesh were included in the repair. Simply put, mesh adds a direct cost to the hospital. Conversely, from a societal perspective, the use of mesh may decrease hernia recurrence which would allow the patient to be more productive with fewer days out of work, and therefore the use of mesh would be less costly to society (especially if the direct cost of mesh is not included as a cost to society). This example demonstrates how different cost perspectives can favor different surgical techniques and allows for the possibility that bias will be introduced.<sup>8,9</sup> Similar to the hospital perspective, the third-party payer perspective (that accounts for costs as payments made by insurance companies or Medicare) would determine that the use of mesh would be an additional cost compared to performing the component separation alone.

While there is no single cost perspective that is necessarily superior to another, the appropriate perspective taken by

a study depends on the research question to be answered,<sup>6,10</sup> and this should be declared and justified. There is a general consensus in the existing medical literature that adherence to strict methodologic principles is of utmost importance when conducting cost-analyses due to the tendency for bias to arise within this setting.<sup>10-17</sup> The cost perspective has been described as one of the basic principles which constitute the appropriate minimum standard for performing cost-effectiveness analyses.<sup>4,6,7,15,18-27</sup> Despite the agreement on the importance of rigorous methodology, there have been several systematic reviews evaluating the methodology of cost-analyses in diverse areas of medicine including General Surgery,<sup>24</sup> ENT,<sup>28</sup> OB/GYN,<sup>21,22,26,29</sup> Gastroenterology,<sup>30,31</sup> Radiology,<sup>23,32</sup> and Pharmacoeconomics,<sup>27</sup> all of which have demonstrated suboptimal adherence to appropriate methodologic principles, including declaration of the cost perspective.

Given that there is an increasing interest in economic evaluations within plastic surgery, an analysis within this field is necessary to define the quality of existing economic evaluations and to guide improvements for future efforts. Furthermore, few studies have examined the validity of the declared perspective, as most methodologic evaluations simply consider the presence or absence of a declared perspective without addressing the accuracy of the stated perspective. Given the complex methodology of economic evaluations combined with the relatively new focus on this type of research, we feel that a review of the accuracy of declared perspectives is warranted. The goal of this study was to perform a literature review of cost-analysis research performed in the plastic surgery literature to determine the prevalence of studies accurately declaring and justifying their perspective, and to inform the readers on why such declarations are important in understanding potential bias in the results.

## Methods

### Search strategy and review of literature

We performed a comprehensive literature review following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.<sup>33</sup> We searched Medline using the MeSH terms "Surgical Procedures, Operative," (term exploded and focused, limited to the economics subheading) and "Cost-Benefit Analysis" (under which the terms "Cost-Effectiveness" and "Cost-Utility Analysis" were included). We limited the search to English-language papers published in North America or Europe within the last 10 years to focus our study on the most recent tendencies in cost-analysis reporting. We identified additional articles by performing a manual review of bibliographies of retrieved studies. Our last search was performed on January 30, 2017. Citation data including abstracts were exported from Medline into Microsoft Excel. Microsoft Excel 2016 was used for all data handling, management, and analysis. There is no review protocol as data collection methodology is outlined in this section.

Two authors (MMB, MP) performed a title and abstract review to evaluate all search results for inclusion and exclusion, with disagreements resolved by a third author (AC). For

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