

## Public hospitals five-star rating considering interactions in pairs of access and quality criteria

In pursuit of a more sustainable future, populations and economies need to be protected by stronger and more resilient health systems. Their complexity requests adequate assessment frameworks for improving the access and quality of their services. Due to the multidimensional nature of health systems, this study presents a collaborative multi-criteria decision-aiding framework to assess the performance and classify public hospitals' performance in terms of service quality and access using a five-star rating system. Existent studies in this area usually assume criteria independence, besides modelling criteria interactions could be more realistic. However, this notion has not yet been entirely understood, nor have there been any applications to the health sector. Thus, our framework innovates by modelling interactions in some pairs of criteria, identified by the decision-maker, using the ELECTRE TRI-nC method. We obtained a five-star rating for 26 Portuguese public hospitals. The majority hospitals were assigned to '2 stars' ('poor') and '3 stars' ('average') categories over the considered 4-year period. We conclude that assuming criteria dependence reveals more realistic results in comparison to a criteria independence assumption. We observed that the number of doctors and nurses does not influence the assignment of the hospitals to the categories. Robustness analyses evidence the framework's credibility.

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