Performance Assessment of Medical Diagnostic Laboratories: A Network DEA Approach

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Abstract

Rationale, aims and objectives

The main purpose of this paper is to measure the efficiency and ranking of medical diagnostic laboratories by applying a Network Data Envelopment Analysis.

Methods

In this study, each medical diagnostic laboratory is considered as a decision making unit (DMU) and a network data envelopment analysis (NDEA) model is utilized to calculate the efficiency of each medical diagnostic laboratory. Therefore, we design a series four-stage system composed of three main laboratory processes (the pre-test process, the test process and the post-test process). We also consider sustainability criteria in order to cover social, economic, and environmental problems of health care organizations.

Results

The results show that three of the 22 considered laboratories are efficient. Therefore, the network DEA approach can lead to performance scores and ultimately real ranking. Also, the average efficiency scores show that the decrease of the reception unit's efficiency results in a decrease of the efficiency of each laboratory. Therefore, the laboratories can increase the number of patients. Along with the intermediate values of the reception unit and the sampling unit, the efficiency of the reception unit increases, which results in an increase for the overall efficiency of each laboratory.

Conclusion

The proposed model can appropriately help the administrators and managers to identify inefficient units in their laboratory and ultimately improve the laboratory performance.

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