MEASURING THE EFFICIENCY OF POLYCLINICS IN THE HEALTH SECTOR USING FUZZY DATA ENVELOPMENT ANALYSIS

SUMMARY

The healthcare sector is a strategic field that demands continuous improvement due to increasing demand and the necessity of managing limited resources effectively. In this context, data envelopment analysis emerges as a crucial tool for enhancing service quality and ensuring cost-effectiveness. Particularly at the outpatient clinic level, performance assessments demonstrate the efficient use of limited resources—such as personnel, costs, and infrastructure—and thus support health administrators in making strategic decisions.

In this study, the efficiency levels of 23 outpatient clinics operating in a private hospital were evaluated using a fuzzy data envelopment analysis (FDEA) approach. Initially, a comprehensive dataset containing 10 inputs and 21 outputs was compiled. Following correlation analysis, the number of variables was reduced to 4 inputs and 5 outputs. The selected inputs include "total number of working days," "total drug and material costs," "share of general operating expenses (per m^2)," and "total appointment capacity," while the outputs comprise "number of individuals receiving services," "average income per person," "number of individuals who underwent surgery," and "number of laboratory tests performed." To address the inherent uncertainty and variability in the healthcare sector, an α-cut-based FDEA model was employed instead of traditional data envelopment analysis. Through this model, real-world data—often imprecise and inherently fuzzy—were incorporated using fuzzy sets. This approach not only offers a more realistic evaluation of outpatient clinic performance but also clearly identifies areas where efficiency improvements can be achieved.

The findings provide valuable insights for health administrators, enabling them to make effective decisions regarding resource planning, personnel management, and budget optimization within the scope of each outpatient clinic.

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