Approaching the management of hospital units with an operation research technique: The case of 32 Greek obstetric and gynaecology public units ☆

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Abstract

Controlling healthcare costs is a multifaceted problem for governments all over the world, as they have the difficult task of ensuring that patients receive high quality care, and that this is delivered as efficiently as possible. Through the use of quantitative analysis, an attempt is made to determine the areas of activity of 32 Greek Public Obstetrical and Gynaecological Units which present problems with regard to their performance. Based on the results that emerge from the application of Data Envelopment Analysis in the 32 hospital units of the sample, information is provided to their managers, which refer to: (i) the degree of utilization of their production factors, (ii) the particular weight of each factor of production in the formation of the relative efficiency score, (iii) the utilization level of each factor of production, and (iv) those hospital units that utilize their factors of production in an optimal way and constitute models for the exercising of effective management. The derived information assists in the formulation of an appropriate policy mix per hospital unit which should be applied by their management teams along with a set of administrative measures that need to be undertaken in order to promote efficiency.
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1. Introduction

The Greek health care system is characterized by the coexistence of the National Health Service (NHS), a compulsory social insurance and a voluntary private health insurance system [1]. The NHS provides universal coverage to the population operating on the principles of equity, social cohesion and equal access to health services for all. Under this context, citizens are not directly dependent on a specific healthcare institution. On the other hand, they are free to choose amongst a variety of healthcare units depending on the type of treatment they wish to follow.

It should be pointed out that the Greek Ministry of Health decides on the overall national health strategy and the relative health policy issues within Greek healthcare organizations. Its main responsibilities, amongst all, are the definition of priorities, the approval and extension of funding for proposed

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activities and the resource allocation at a national level. With the latest reforms, the main objectives were the decentralization of the system with the establishment of 17 Regional Health Authorities. Decentralization efforts devolved political and operational authority to Regional Health Authorities but were only partially fulfilled [2]. Decision making and all administrative procedures continued to depend on a very centralized and bureaucratic Ministry of Health [2]. The consequences of this fragmentation, combined with the lack of a monitoring system had an impact on the extent and quality of services provided to beneficiaries of different funds, leading to over-consumption of services and serious socioeconomic health inequalities [3].

Moreover, Greek public hospital units operate within a framework characterized by limited economic resources, a restricted number of beds and a geographically unequal distribution of both personnel and patients [2,4]. There are wide discrepancies between the number of hospitals and number of hospital beds allocated in different regions [2] and a wide variation between the distribution of resources in urban and rural areas [5]. For example, in the greater Athens area in 2000 there were 6.4 hospital beds per 1000 population while the corresponding ratio in Central Greece was 1.2 beds per 1000 population [2]. These characteristics are more vivid in the provision of health care services in obstetrical and gynaecological (O&G) cases than in others [6,7] and are attributable to demographic and national factors. The lack of gynaecologists/obstetricians together with the limited experience of the serving staff on obstetric issues in rural areas, pose difficulties in the routine follow-up of pregnant women [7,8]. As a consequence, women choose to seek health services and even follow-up examinations at tertiary hospitals in Athens [8].

Under this context, hospital O&G management staff is expected to perform an optimal utilization of resources in terms of quantity and quality of offered services. In other words, managers are expected to achieve efficiency despite the fact that reality imposes certain, well-known limitations. Under these circumstances, the use of quantitative methods can provide the management staff useful information concerning:

(1) the evaluation of the efficiency score regarding the utilization of the available production factors;

(2) the contribution of every productive factor used and of the health services provided (outputs) in the formation of the efficiency score;
(3) the policy mixture, that is, the combination of inputs and outputs, which must be applied to improve the degree of utilization of the production factors;
(4) the "prototype—models of best practice" hospital units which constitute "models to be emulated" in managing the other hospital units.

This information, when complete, assures the improvement of efficiency and quality when combined with the managers' ability to make analogous with reality, the needs of the receivers of health services and the producers of health services.

The objective of the current study is two-fold. Primarily, to estimate the relative technical efficiency by using a sample from public hospital units that provide obstetrical and gynaecological services in Greece. Secondly, to emphasize the policy implications for health sector policy-makers. These implications can trigger the associated policy-makers in order to conduct a national efficiency study amongst all healthcare organizations in Greece.

The present paper is organized as follows. Section 2 below describes the materials and methods used. This section includes a thorough discussion on the data sources, the Data Envelopment Analysis approach and the inputs and outputs of the study. In addition, the selection strategy for the appropriate sample is presented in conjunction with a discussion for the analysis plan of the study. Continuously, Section 3 provides an outline of the results obtained along with their interpretation. Section 4 is then presenting a discussion on the overall study and its outcomes whereas the last section, Section 5, provides a summary and conclusion remarks.

2. Materials and methods

2.1. Data sources

Data availability and notification of hospital units' managers is very important as it would facilitate decision making and optimize efficiency. The research aim of this study is to provide such a framework by using