

Conference Paper

The Problem of Capacity Management in Greek Public Hospitals

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Abstract

One of the most important problems that the users of Greek National Health System face, is the long waiting lists. Rather superficial explanation of this phenomenon is usually refer the increasing demand for healthcare services, ignoring that the problem is mainly a problem of capacity management, which is associated with the occupancy rate of specific wards of a hospital, and the average length of stay.

The theory of constraints can apply successfully to healthcare organizations, to solve problems of capacity management, reducing the inpatient length of stay and increasing the satisfaction from the offering services as has been proved by international research.

In this paper, we study the problem from this point of view. Our qualitative research revealed that there is a bottle-neck in the normal flow of patients, because of the delays in the imaging departments of the hospitals.

The increase of the capacity of the imaging departments would offer a feasible solution to the problem.

Keywords: theory of constraints, hospitals, efficiency, capacity

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Received: 19 January 2017

Accepted: 2 February 2017

Published: 19 March 2017

Publishing services provided by Knowledge E

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Selection and Peer-review under the responsibility of the EBEEC Conference Committee.

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1. Introduction

The Greek National Health System (ESY) suffers from lack of planning and structure i.e. management [1]. The efficiency and effectiveness of public hospitals are at a very low level and despite the precious resources they consume, they offer poor services that do not satisfy the users of the system [2].

One of the most important problems that users of ESY face, which is related to the qualitative features of ESY, is the long waiting lists, for elective surgeries or exams.

But in fairness, we should mention that the waiting lists are not Greek originality, but they are present in all public health systems of the developed countries. What causes the waiting lists? Despite the fact that these lists cause dissatisfaction in the public, they are, however, essential for the standardization of unpredictable fluctuation of demand of sanitary services and the attribution of priority in urgent incidents. In opposite case, the public health systems should be structured in such a way that they immediately cover any demand for any type of service. However, this overcapacity will have very high costs of underemployment, which is not feasible due to limited resources [3].

Many developed countries record and monitor the phenomenon at national level, trying to ensure that waiting time for patients would be reasonable [4, 5]. In Greece, except that there is no such monitoring at national level, the waiting time seems that far exceeds the corresponding per case time, compared to other countries. It is stated from anecdotal evidence that in some hospitals patients may need to wait even for six months for an elective surgery. An appointment to some hospital outpatient departments needs at least 5-6 months. The waiting time for a mammography is about 3-6 months and for a pap test 2-3 months. These long waiting times are in many cases the reason for an extensive black economy and informal payments, so that patients can bypass waiting lists [6]. The problem has become sharper over the last five years because of the deep financial crisis that the Greek economy face. Due to crisis there are a lot of patients who instead of private healthcare sector, select the public hospitals in order to be treated, and this fact makes the long waiting lists even longer. The long waiting lists are often cited in the Greek media and the usual explanation given by politicians and governors of the hospital, refers to the limited resources to reduce the health professionals and the increasing demand for healthcare services. These explanations sound obvious and reasonable. But the phenomenon is older than crisis and it is certain that crisis made it worse, but it is not the cause that created it.

In this article, we will refer to the problem of the long waiting lists, by examining it in terms of organization and management of the production process, investigating the case of problems in the flow of the production process.

The structural problem of the Greek National Health System is the complete lack of rationalization. Proposals of the Greek Governments concerning the appointment of professional managers, with strong decision-making authority proved to be mostly rhetoric and were never applied. Top management positions in Greek public hospitals are assigned to members or sympathizers of the government party, in a clientelistic fashion, even without any managerial experience in the private sector, and this is a rule for all public organizations [2]. Under such circumstances, we should investigate if the problem of waiting lists in Greece, is exacerbated by the lack of organization of the production process.

2. The Study

In order to gain an understanding of underlying reasons of the excessive waiting lists in Greek hospitals, we conducted an exploratory qualitative research, through individual interviews with doctors and clinical directors of specific clinics. Such a research would provide insights into the problem and would help us develop ideas or hypotheses for potential quantitative research. We conducted 10 doctors, medical directors of specific clinics of large and medium size public hospitals, located in Athens. Five of them accepted to participate in our study. The clinics that they are directing are:

Surgery (2 directors)

Orthopedic (3 directors)

All the interviews were taken in 2015.

The interviews were semi-structured. The interviewees answered to open ended questions about the problems they face in the management of the capacity of their clinic.

In all the above clinics there are waiting lists for elective surgeries with waiting time to vary from 2 to 6 months.

The factors which were more frequently reported as the reason of the problem were:

1. The lack of medical and nursing staff.
2. Insufficient beds.
3. The seasonable and sometimes unpredictable fluctuation of the demand for specific healthcare services.

However, all directors admitted that many times there are problems to the smooth flow of patients because of delays encountered in the course of their hospitalization. These delays prolong the length of stay in the hospital and therefore reduce the bed turnover ratio of the clinic. Thus, while the employment index of the bed is too high, patients served is less.

According to the directors, these delays can occur due to medical reasons, such as for example the postponement of a surgery because of some infection presented by the patient, or may be due to external factors.

When directors were asked which external factors are usually responsible for delays in the smooth flow of health care process in their clinic, the reply of the respondents was common; delays in lab departments, especially the imaging.

Focusing on this issue, it was revealed from the interviews that because of the increased use of new technologies in imaging tests, they have become an indispensable diagnostic tool, both, before the admission of the patients in the hospital, in order to diagnose their problem, but also during their hospitalization to examine the effectiveness of treatment, any complications, etc. Because of this, the imaging Department accepts orders for examinations from all the outpatient clinics and inpatient hospital clinics as also from the emergency department. As a result, the imaging department cannot withstand all this workload in a timely manner and observed delays in tests which in turn cause delays in patient flow of parts that the ordered.

Hence, the imaging department cannot withstand all this workload in a timely manner, resulting in delays in the trials, which in turn are causing delays in the flow of patients of the clinics that ordered the exams. One of the directors of orthopedics mentioned a case of a patient who had undergone total hip replacement and had to remain five additional days in hospital since that was the waiting time for the realization of an ultrasonography of the leg veins, which was required in order to be discharged.

3. Discussion

The “production process” of providing health services from a hospital, is an extremely difficult case with many peculiarities. Inpatient services require the patient to be admitted to the hospital to start their treatment and then to be discharged upon completion of the treatment. The course of treatment may include several different services such as diagnostic tests, surgical procedures, recuperation time, meals, etc.

Although the inpatient course of treatment is designed to address a primary pathology, or reason for admission, secondary pathologies, called “co-morbidities” may also be treated during an inpatient stay. The complex nature of inpatient services allows for multiple definitions of this component of output [7].

There are certain key ratios measuring the effectiveness of the healthcare production process:

The occupancy rate is a calculation used to show the actual utilization of an inpatient health facility (the whole hospital, a specific clinic etc.) for a given time period. It is expressed as a percentage and it is an indicator of “productivity” and efficiency of hospital, very useful for health planning purposes, calculated by the formula:

$$(\text{Inpatient Days of Care} / \text{Bed Days Available}) \times 100$$

A target of occupancy rate of 100% can exist only on a theoretical basis and cannot be easily achieved mainly because of the unpredictable nature of the demand for healthcare services, as also because of seasonable fluctuation in the demand for specific medicine specialties. However, healthcare services provided by a hospital must be available whenever need arises (day and night, on workdays or during holidays). A low occupancy rate can cause underemployment of the production resources and inactivity costs since a large amount of the hospital costs are fixed costs that do not vary depending on production. On the other hand, when demand exceeds the offer in beds, the occupancy rate is higher than 100% and as a result we have long waiting lists and a “jam” in the patients flow, with emergency cases being treated in hospital corridors.

The average length of stay in hospitals is another statistical calculation that is used for health planning purposes and it is closely related with the bed turnover rate. The formula for its calculation for a period of time is:

$$\text{Average Length of Stay} = \text{Total inpatients days} / \text{Total Admissions}$$

Total inpatients days: Sum of each daily inpatient census for the time period examined.

Total Admissions: The total number of individuals formally accepted into inpatient units of the hospital during the time period examined. Births are excluded from this figure unless the infant was admitted to the hospital’s neonatal intensive care unit.

Bed Turnover Rate

The bed turnover rate is a measure of hospital/clinic utilization. It includes the number of times each hospital bed changes occupants. The formula for the bed turnover rate is: **Total number of discharges (including deaths) for a given time period / Average bed count for the same period**

Shortened length of stay increases bed turnover. As hospitals worldwide strive to become more efficient, hospital managers are exhorted to improve capacity management and maximize patient throughput.

Our research revealed that diagnostic departments in the hospital production process, operate in a lot of cases as constraints in the normal flow of the patients, as they are described in the theory of constraints, otherwise as bottlenecks.

Theory of Constraints (TOC) is a business philosophy that was first described by Eli Goldratt [8] in the early 1980s and has since been used extensively, mainly in industry. It is rather a set of thinking processes than a list of solutions, that provides focus in a world of information overload and uses cause and effect logic to understand what is happening and then to find ways of improving it. TOC initially attempted to solve problems in production systems of manufacturing firms, but soon incorporated solutions to problems relating marketing and sales and to supply chain management [9]. Furthermore, TOC philosophy has been used to explain problems which arise in various service organizations.

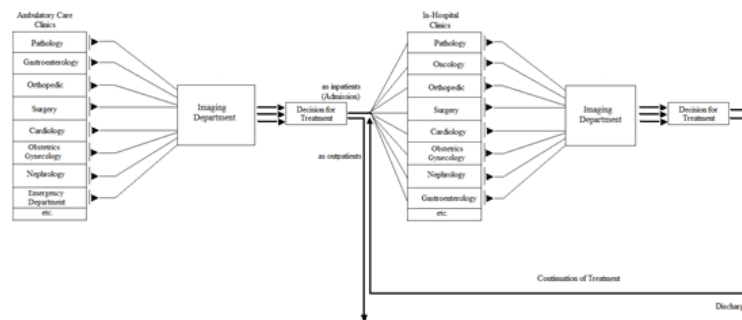
TOC is based on the assumption that organizations are complex systems consisting of resources, which are linked by the (interacting) processes they perform, in order to achieve their goal. The strength of this chain of multiphase processes –as in every chain- is defined by the strength of its single weakest link that means that the ability of the organization to achieve its goal depends at least on a single, and at most on very few constraints, that prevent the organization from achieving a higher level of performance [10]. These limiting factors that are frequently described as bottlenecks, can be physical such as machines or equipment, policy constraints, behavioral constraints, or even external constraints.

The common mistake of management, according to Goldratt, is the focus on measurement of the local (or departmental) efficiency rather than the measurement of system's efficiency.

In our case, there is a dramatic rise in diagnostic imaging during the past decades. The factors that explain this increasing usage of imaging tests, are mainly the wider availability of technology, the favorable reimbursement and the increasing demand by patients and physicians. It is remarkable that in a lot of cases, the increased demand by physicians is driven by their fear of medical malpractice law-suits [11]. Greece is the first among the OECD countries with 0,32 CT per capita when the corresponding number in US is 0,18 and in England 0,03 [12].

Therefore, all the clinical departments of a hospital order imaging tests to diagnose with certainty and in its entirety the patients' health problem, as well as to determine the treatment, the improvement, or the complications that maybe created. This causes a jam in Imaging departments, which in turn causes delays in decisions of doctors of other clinics and eventually elongates the length of stay in the clinics of the patients.

The following figure gives a graphic illustration of the problem:



4. Conclusions

Goldratt summarized the application of TOC as having five key steps:

1. Identify the constraint.
2. Get the most out of the constraint. There are several ways in which the efficiency of the constraint can be maximized.
3. Support the constraint through subordinating the non-constraints to the constraint.
4. Elevate the constraint. The first three steps mainly focus on changing the way the constraint is used without spending money.
5. Go back to step 1. Goldratt argued that TOC was a continuous process of improvement. Inertia could become the next constraint.

As for the 2nd and 3rd step of the proposed solutions, the administrations of hospitals should examine the possibility of increasing the capacity of Imaging departments based on their existing infrastructure.

A good tool for this purpose that has already been successfully used, is the theory of constraints, combined with the philosophy of lean production [13–17].

It is necessary to map the process in all clinics and departments and examine if there are sub-processes that do not add value to the process. Can they be reduced or even eliminated in order to increase a turnover in specific segments?

The international literature mentions cases in which the capacity of specific parts were increased by 25%, just from the reorganization of sub-processes in patient flow, without any increase in equipment or personnel [13]. Such studies should also be exploited in Greek hospitals as well.

As for the 4th step of the proposed solutions, the investments without judgement especially during the period of the crisis affecting the Greek economy, is both impossible and ineffective. However, targeted investment in equipment and personnel in these weak parts of the Greek hospitals which can improve the efficiency of the whole organization is both essential and feasible.

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