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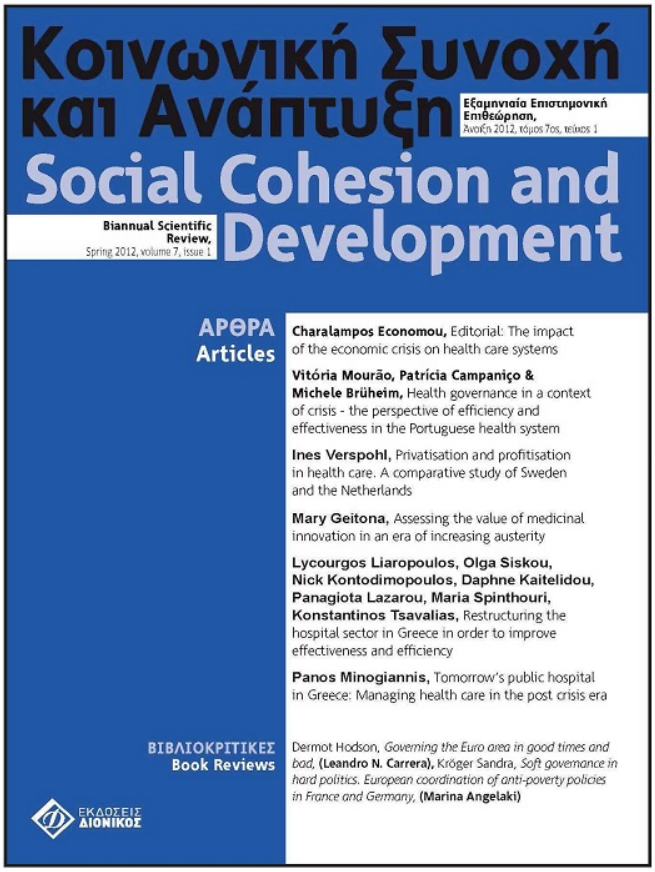

Restructuring the hospital sector in Greece in order to improve effectiveness and efficiency

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Restructuring the hospital sector in Greece in order to improve effectiveness and efficiency

Lycourgos Liaropoulos, Olga Siskou, Nick Kontodimopoulos, Daphne Kaitelidou, Panagiota Lazarou, Maria Spinthouri, Konstantinos Tsavalias, *University of Athens*

Αναδιάρθρωση του νοσοκομειακού τομέα στην Ελλάδα προς βελτίωση της αποτελεσματικότητας και της αποδοτικότητας

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ABSTRACT

This paper discusses the study focused on the reform of Greek Hospital Sector, also known as "hospital mergers". The aim of the study was to propose a new pattern of organizing hospitals in groups based on the reform of emergency care and the management of five main chronic diseases (AMI, Stroke, Cancer, Diabetes Mellitus and COPD). The proposals in general concern the creation of a national network of health services provided mainly by primary healthcare units and the largest hospitals of the groups in each health region. In the context of improving the hospital sector efficiency, ways of collaborations between private and public sector and expenditure containment measures are presented. The restructuring of the public hospital sector relied on six specific criteria including the population criterion, catchment area, hospital size, infrastructure age, utilization of hospital facilities and cost. Due to its nature, the study was exposed to various factors such as the diversity of actors being involved, collection and compilation of the relevant data in a short term of three months, last minute adjustments and the variety of audience.

KEY WORDS: Restructuring hospital sector, hospital mergers, cost-efficiency criteria

ΠΕΡΙΛΗΨΗ

Το άρθρο αυτό παρουσιάζει τη μελέτη που αφορούσε στην αναδιάρθρωση του Ελληνικού Νοσοκομειακού Τομέα Σκοπός της μελέτης ήταν να προτείνει ένα νέο πρότυπο οργάνωσης των νοσοκομείων σε ομάδες με βάση την αναμόρφωση της επείγουσας φροντίδας και τη διαχείριση των πέντε κύριων χρόνιων νοσημάτων (Οξύ Έμφραγμα του Μυοκαρδίου, Αγγειακό Εγκεφαλικό Επεισόδιο, Καρκίνος, Σακχαρώδης Διαβήτης και Χρόνια Αποφρακτική Πνευμονοπάθεια). Στο πλαίσιο της βελτίωσης της αποτελεσματικότητας και αποδοτικότητας του νοσοκομειακού τομέα παρουσιάστηκαν προτάσεις όπως η συνεργασία ιδιωτικού και δημόσιου τομέα καθώς και μέτρα περιορισμού των δαπανών. Η αναδιάρθρωση του δημόσιου νοσοκομειακού τομέα στηρίχθηκε σε έξι διακριτά κριτήρια τα οποία συμπεριελάμβαναν το πληθυσμιακό κριτήριο, τη συγκέντρωση του πληθυσμού, το μέγεθος του νοσοκομείου, την παλαιότητα των υποδομών, την ένταση της αξιοποίησης της νοσοκομειακής υποδομής και την οικονομική αποδοτικότητα του νοσοκομείου.

ΛΕΞΕΙΣ-ΚΛΕΙΔΙΑ: Αναδιάρθρωση νοσοκομειακού τομέα, συγχωνεύσεις νοσοκομείων, κριτήρια κόστους-αποδοτικότητας

1. Introduction

On January 5, 2011 the Minister of Health announced that Prof. L. Liaropoulos of the Athens University was commissioned to conduct a study on restructuring the Greek Hospital Sector. The study was part of the obligation Greece had undertaken to contain health care costs, under the MoU between Greece on the one hand and the IMF, the ECB and the E.U Commission (also called the "Troika") on the other. Prof. Liaropoulos was free to form his own study group, which was subsequently formalized by a decision of the Secretary General of the Ministry of Health, and a budget of €65.000 was agreed upon by the chief investigator and the Minister. The Study was to be completed in a period of three months. The time schedule was kept, and, beginning with Athens in April 10, the study was presented in public hearings in the various Regional Health Administrations. The task of hospital sector restructuring, also known as "hospital mergers" implies the reorganization of two or more hospitals, with the aim of lowering the total costs of the services they provide, and does not necessarily result in the closure of one hospital and the extension of another, nor does it imply that a new investment replaces two or more older hospitals. A "merger" may mean that hospital services are reduced in one hospital and concentrated in another in such a way that the former hospital retains only a limited number of specialties or services.

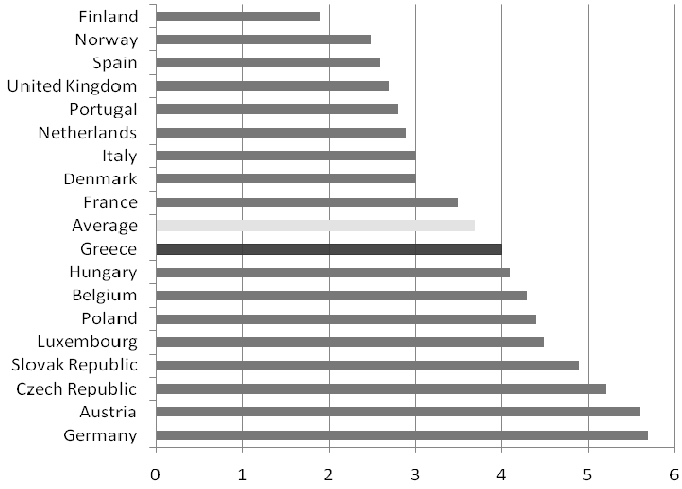
The inefficiencies and shortcomings of the Greek NHS, since its establishment in 1983, are well known and have been covered extensively in the literature (Davaki & Mossialos, 2005; Mossialos & Allin 2005, Mossialos et al., 2005). Legislative initiatives undertaken in the 1990s to confront these inefficiencies were not successful due to political particularism, fiscal constraints and administrative weaknesses, thus resulting in either partial implementation or total abolition of the attempted reforms (Kristensen, 2010). Hospital mergers captured the public eye and became the center piece of health policy reform at the time of serious fiscal and debt crisis faced by Greece during the last two years. The reason why health has been targeted is the fact that Greece at the end of the previous decade came to spend about 10% of GDP [OECD Health Data, 2011] and at the same time it has been widely published that corruption, under-the-table payments and tax evasion are rampant (Liaropoulos et al., 2008). Despite the widespread interest and the high level of exposure given by the mass media, the fate of hospital restructuring four months after the completion of the study is not promising. The political will and the determination to face up to the proposed changes, although these are not very radical, do not seem to be very firm. Obstacles are also posed by the arcane administrative system, the complexity of the legal status of many hospitals and the understandable resistance to change inherent in major social re-engineering projects.

2. Study presentation

2.1 The hospital sector in Greece

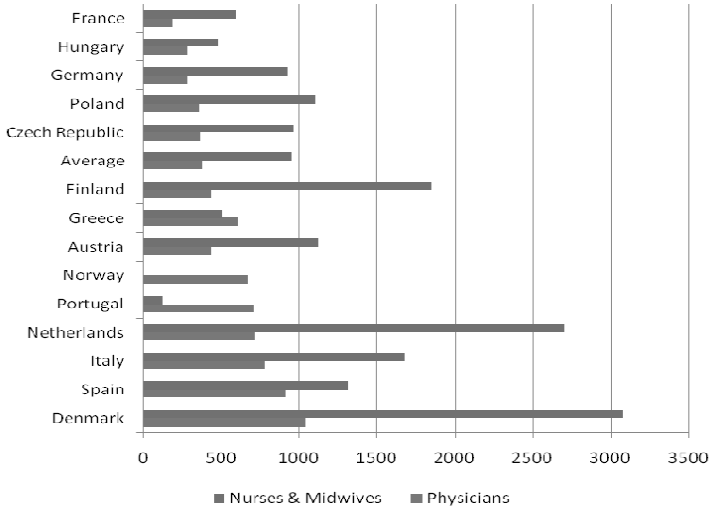
Greece has currently 158 Public Hospitals and 84 private hospitals and small clinics. The main characteristics of public hospitals which are the subject of this study are the small bed capacity, the age of the infrastructure, and their uneven distribution along historical lines and patterns of political patronage. Considering hospitals per 1,000 inhabitants (Fig. 1), Greece is at the high end of the scale.
Beds per 1000 population
Doctors /bed
Nurses/bed

Figure 1: Curative care beds / 1,000 pop in 2008



Source: OECD Health Data, 2010

Figure 2: Hospital Physicians and Nurses & Midwives per 1,000 hospital beds, adjusted with occupancy rate in 2008



Source: OECD, Health Data 2010

2.2 The aims of the study

What the study attempted to do was to propose a new pattern of organizing hospitals in order to achieve better productivity, higher quality of care, and greater efficiency both at a sector level and at the level of groups of hospitals or even individual hospitals. Greece has a great number of doctors, but few nurses. It has a surplus of high-end diagnostic and curative technology, but the majority is

in the private sector. Finally, the public hospital sector has two very serious management problems. First, hospital managers are political appointees with all the serious drawbacks of cronyism.[1] Many writers have located party plutocracy as the main source of corruption in Greek public administration (Mouzelis, 2005). Second, the main drawback in public administration is the total lack of functional supervising mechanisms independent of government direct control. Despite the widespread and persistent reference to corruption and wasteful behavior in hospitals for at least 20 years, there are still no reliable computer-assisted financial reporting mechanisms, pharmaceutical consumption is almost unchecked and the, often fraudulent, misuse of medical technology widespread. Merging hospitals, has always been seen as a means to achieving economies of scale, better utilization of resources, and the application of new management techniques. It is for this reason that the main building block of our analysis and our main proposal is the creation of hospital groups of two to six hospitals as a framework in which such productivity improvements can be realized.

3. The main branches of the analysis

3.1 Emergency care

The main problems in the hospital sector in Greece centers around emergency care and the way patients are admitted. Emergency care in the two Metropolitan Areas of Athens and Thessaloniki is organized on a rotating basis where only a few hospitals admit patients on a given day, while all other hospitals are essentially "closed for business" in terms of new admissions. The result is overcrowding every 3-4 days, in every hospital on this rotating "emergency duty" schedule. The problem with patient admissions is also related to this. Since patients can only be admitted into a hospital when it is on emergency duty, hospital doctors arrange for "their" essentially private patients to come to the emergency department, and the patient is admitted on bogus emergency admission orders by the "attending" physician. Of course, this means that an actual emergency case may find needed hospital beds already occupied, if brought to the hospital at a late hour, while non-emergency cases admitted before will probably wait for 2-3 days until the necessary tests and probable surgery can be scheduled. The end result is a waste of resources and money, patient dissatisfaction, often resulting in negative media coverage, and on rare occasions, adverse effects on a patient's health.

Our proposal to deal with this situation is the creation of independent Emergency Care Units in selected large hospitals, operating on a 24 h/7 days basis. These hospitals are usually the largest in a group of hospitals.

3.2 Small hospitals - hospitals in Islands

Another area where intervention in the form of hospital mergers is required has to do with the small size of Greek hospitals. Greece features a vast number of islands and islets, ranging between 1,200 and 6,000 depending on the definition, 227 of which are inhabited, although only 78 of those have more than 100 inhabitants. This particular form of insularity does not exist in any other European country. The population of many of the islands may increase by ten times or more during the summer as a result of tourism. Thus for the larger islands which have either a general hospital or an expanded health center, and taking into consideration that obviously no other health facilities are available in close proximity, it would be violating the important social criteria of equity and accessibility to propose any "reducing" restructuring of these particular hospitals,

and all efforts should be directed to enhancing their role in their respective catchment areas. Thus, by excluding these island hospitals (and the respective populations) from the analysis, the number of general hospitals in Greece per 100,000 inhabitants falls below 1.98 calculated previously and suggests an abundance of approximately 30 (and not 40) hospitals compared to the OECD average of 1.62 general hospitals per 100,000 inhabitants.

3.3 The five main clinical areas of interest

We focused our interest on re-organization of the hospital sector concerning the effective management of the five main chronic diseases: Acute Myocardial Infraction (AMI), Stroke, Mallignant Neoplasms, Diabetes Mellitus, and Chronic Obstructive Pulmonary Disease (COPD). We analyze the status quo concerning the provision of health services for facing the above mentioned diseases and also we submit specific proposals for improving the provided services.

3.3.1 Cardiovascular diseases

Cardiovascular diseases consist the first cause of death both in Greece and in Europe, as they are related with half of deaths and moreover they consist the first cause of inpatient admissions in Greece (OECD Health Data Base). According data derived from Eurostat, the standardized mortality ratio concerning ischemic heart disease and cerebrovascular diseases (for the period 2006-2008) is higher in Greece than in the other EU countries since they were estimated to 72.2 and 86.8 per 100,000 pop respectively, when the corresponding European ratios were 70.4 and 43.5 per 100,000pop., the same period.

3.3.1.1 Strokes

Strokes consist the third cause of death and the first cause of chronically disabled people in Greece, where the incidence is 310 new cases per year per 100,000 pop (30.000-35.000 in total). About one-third of these patients (approx. 10.000) are dying within the fisrt year, and 35% become permanent disabled. Patients suffering from stroke occupy 15% of in patient beds, with often extended length of stay due to insufficient development of rehabilitation units (Vemmos et al., 1999 & Ntaios et al., 2011).

Managing patients suffering from Stroke: status quo and problems

- Population is not sufficiently informed about the preliminary symptoms of stroke due to the lack of health promotion programs. However, thanks to the effective emergency ambulatory services, the time between the onset of symptoms and the admission to the emergency care services of the hospital is estimated to less than 3 hours for the 45% -60% of patients.
- The majority of patients suffering from stroke are admitted in internal medicine departments and only few of them are admitted in neurological departments (mainly younger patients less than 50 years old), while the existing specialized stroke units are very few, with only 25-30 beds in total. Moreover, those few stroke units are facing staffing problems especially in nurses, physiotherapists and logo therapists.
- There are serious problems concerning the access to rehabilitation services for these patients, since few public centers operate, located mainly in Attica. Consequently, after the acute phase of the disease, the majority of patients are hospitalized either in private rehabilitation centers, where the cost is party covered by Social Security Funds, or return to their homes without actually participating in any specific rehabilitation program.

Proposals for improving provided services to patients suffering from Stroke

Our main proposal for managing patients with stroke was the development of *a national network of specialized stroke units* all over the country, in a way that each patient suffering from stroke could reach one, in less than 90 minutes according the Austrian model. According those assumptions it can be easily estimated that taken into account the incidence of the disease and the average length of stay approximatelly 650 beds are needed. However, due to the economic recession of the country, the development of all these units in the near future is not considered as a realistic aim. Therefore our proposal is, in a pilot phase, to be developed 17 units in big public hospitals all over the country, at which the majority of needed resources already exist (CT, MRI, ICU, specialized health professionals etc). Each hospital in which a stroke unit is operating would be considered as a specialized referral center for strokes, where the complicated cases will be hospitalized. Each one of these specialized stroke unit could be considered as a referal center for its catchment area. Moreover, the adoption of a common *clinical protocol* concerning the management of stroke patients at their arrival at emergency departments should be a priority along with the development of telemedicine services in order to support physicians (both at diagnostic and therapeutic phase) in remote areas.

3.3.1.2 Acute myocardial infraction

According the results of HELIOS study conducted in the years 2005-2006 in 31 Greek hospitals, the incidence of AMI is 18.5 patients /10,000 pop (which mean 20,000 new cases in total per year) without remarkable variances, between the various geographical areas. The corresponding ratio in other EU countries varies from 9-31.2 patients /10,000pop. The inpatient fatality of AMI in Greece is estimated to 7.7%, while in Europe varies from 4.2-13.5% (Andrikopoulos et al., 2007).

Managing patients suffering from AMI: status quo and problems

- There is a remarkable number of patients who would be potentially eligible for receiving *reperfusion therapy*, but in practice they don't receive. The pre-hospital beginning of reperfusion therapy (in Health Centers and in ambulances) is not applying in Greece, although the advantages it provides.
- The percentage of *acute* Percutaneous Coronary Interventions (PCI), is limited because of the lack of a well organized emergency transportation system to hemodynamic laboratories.
- More over the time between the onset of symptoms (pain) and arrival to hospital is high, due to delays from the beginning of symptoms to call for help from the emergency ambulatory services.

Proposals for improving provided services to patients suffering from AMI (and other heart diseases)

Our proposal for managing patients suffering from severe heart diseases, includes the determination of already existing hospitals in each health region that would be considered as *specialized referral centers* for these patients. These hospitals should have at least cardio logical department, AMI unit, hemodynamic laboratory and in some cases cardio surgery department.

Moreover, as the development of many new hemodynamic laboratories (for performing PCI), is not considered as a realistic aim (due to geographical particularities of the country and the high cost of development) we proposed to increase the rates of *acute reperfusion therapy* that in some cases should be performed even in pre-hospital units (e.g health centers, emergency ambulance services etc). In order to achieve the previous purpose, the modification and adaptation of the European Society of Cardiology clinical guidelines is necessary.

However, we considered as necessary the development of one new *hemodynamic laboratory* in the area of Peloponnesus, where none exists, in order to be covered a population of 600,000 inhabitants.

Finally, we proposed the creation *of a Coordinating Center in Emergency Ambulatory Services,* in order to manage in an effective way the transfer of acute heart diseases patients to the appropriate health units. This center should be supported by telemedicine services and also could be staffed by transferring existing personnel, from other units (which are under operating).

3.3.2 Malignant neoplasms

Malignant neoplasms constitute the second cause of death both in Greece and in Europe. According the European Cancer Observatory (Country Report) the age standardized incidence rate per 100,000 pop in 2008 was estimated in Greece to 235.3 (38,229 new cases in total) while in EU-27 countries the corresponding ratio was estimated to 374.1. The same year, the age standardized mortality rate per 100,000 pop was estimated to 153.5 per 100,000 pop (26,815 deaths in total), while the corresponding ratio was estimated to 172.5 per 100,000 pop in EU countries (OECD Health Data Base, 2010). In a study conducted in 2004 by Tountas et al. (2007), was reported that 25% of all deaths were related to cancer. Even though Greek morbidity statistics are not very reliable, it has been revealed from various surveys that ten percent of patients discharged from a hospital have been hospitalized due to cancer disease.

Managing patients suffering from Mallignant Neoplasms: status quo and problems

- In general, geographical imbalances concerning the provision of oncological services are reported both for screening and therapeutic interventions. Some patients are late diagnosed due to insufficient development of mass screening programs and generally because of the under development of Primary Health Care.
- There is a limited number of specialized Oncological inpatient departments even in territory hospitals and insufficient number of some kind of biomedical devices (3.5/million pop. linear accelerators while in a study conducted from the EC in 2005, the needs for Greece was estimated to 5.5/million pop.)
- Even the few operating oncological departments are facing staffing problems and more over in the majority of hospitals the oncological boards are not performing in practice.
- Hospices and generally Palliative care services are also under-developed in all country.

Proposals for improving provided services to patients suffering from Mallignant Neoplasms

As health care delivery system in Greece is hospital oriented, services related to patients with cancer are characterized by structural and allocation problems, understaffing and low patients' accessibility.

Patients with cancer need a multidisciplinary approach. Health services for these patients in Greece are totally fragmented. The suggestion is to create an *oncology health services network per health district* in order to facilitate services and health workers coordination to a more integrated model *with compliance to national or international clinical guidelines for cancer treatments.* The network will consist of a specialized oncology centre and three graduate units. All these services should be in direct coordination with primary health services of the region. Health region after examination of criteria set fulfilment will be able to certify specialized health units for a specific neoplasm or group of neoplasms. This will give the region an outstanding position in the cross border care services mosaic at the South - East Europe.

The suggestion also includes the reinforcement of early diagnosis and treatment units of primary and secondary health services and the increased staffing with oncologists, radiation physicists, nurses and other specialties at all health regions. Also it is suggested to reorganize small hospitals *per health district to cancer palliative care and end-stage patients centres.* An investment in new health care technologies such as adequate number of linear accelerators per health region is also part of the suggestion. The ultimate purpose of all these is more oncology patients have an easier access to a more integrated and quality health services network.

3.3.3 Diabetes mellitus

Diabetes mellitus constitutes the 12th cause of death all over the word. The probability of a patient suffering from diabetes mellitus to die is double compared to the general population. According data from the European Observatory on Health Systems and Policies, the prevalence of diabetes mellitus in Greece was estimated to 0.15% in 2004; while in 2000 the percentage of population over 20 years suffering from diabetes mellitus was estimated to 10.3%.

Managing patients suffering from Diabetes Mellitus: status quo and problems

- Some patients are late diagnosed due to insufficient development of Primary Health Care (especially lack of organized diabetes prevention and screening programs). This is a common phenomenon especially for patients suffering from diabetes mellitus type II.
- There has been developed an insufficient number of clinics relevant to diabetes (obesity clinics, smoking cessation clinics, etc).
- No clinical protocols concerning disease management at the emergency departments of hospitals have been adopted.
- Although there is a sufficient number of internal medicine and endocrinology departments in hospitals, there hasn't been developed a sufficient number of specialized diabetes mellitus departments. Even the few ones, are facing staffing problems mainly for nurses and for specialized physicians on diabetes.
- According data derived from the National Center of Diabetes, only 14 diabetes centres have been developed in the country (11 in Attica, 2 in Thessaloniki and 1 in Patras).
- The average waiting time in order a diabetes mellitus patient to arrange an appointment at a specialized unit of Attica hospitals is estimated from 3.5 to 4 months. This time could be reduced, in case that some patients were referred for follow-up at out patient units.

Proposals for improvi1ng provided services to patients suffering from Diabetes Mellitus

Preventing diabetes is the most effective way to reduce morbidity, mortality and health care expenditures. It includes the modification of dietary habits, regular physical activity, achieving and maintaining normal body weight and avoiding smoking. Therefore and considering the fact that diabetes is one of the main causes of mortality in Greek population, the expected increase in the prevelance of the disease during the coming decades and the urgent need for rational and efficient allocation of resources in the health system, we concluded that it would be necessary to create *an organized National Action Plan to address, control and prevent diabetes* in order to reduce its impact both on the population and on the NHS. Key objectives of the National Action Plan for diabetes should be the early prevention, diagnosis, treatment and management of the disease and the effective, timely, organized and continuous patients' monitoring at all levels of care.

Patients with diabetes need regular monitoring and care by trained health professionals at primary health care level and specialized diagnostic and therapeutic care by specialized health professionals at secondary and tertiary health care level. Our proposal *is to create a regional*

network for diabetes at each Health District as to facilitate cooperation among health services and health professionals and the consolidation of services where appropriate. In addition, networks for diabetes will enable the harmonization among all health services and health professionals with the creation of national (and global) standards of prevention, treatment and rehabilitation of diabetic patients. Special units of each diabetes network will be able to qualify for specific range of services, upon approval by the competent Health District. This certification will also give a significant advantage both on national and on cross-border health care and will strengthen the medical tourism in the country.

Our detailed report includes specific detailed suggestions according to predefined operating criteria for each Health District and each hospital in the country concerning the reallocation of services, staff, departments and clinics, etc. in order to create both a district and a national network for diabetes and to facilitate the coordination of services for diabetic patients across the country.

Our main suggestions for each Health District include:

- Creation of Diabetes Units in all hospitals with pathological sections > 20 beds.
- Strengthening Diabetes Centers with specialized health personnel (mainly nurses and dietitians but also psychologists, GPs, etc).
- Creation of diabetes clinics in primary health care organizations (IKA, OTA, etc).
- Creation of more clinics for obesity, smoking cessation hyperlipidemia, hypertension, etc. in all health regions.
- Development of home care services in many hospitals and health centers.

3.3.4 Chronic Obstructive Pulmonary Disease (COPD)

COPD constitutes the fourth cause of death both in Greece and in Europe. In Greece, the prevalence of COPD is higher than in other EU countries due to the high rates of smoking habit (WHO, Centers of Disease Control and Prevention). It is estimated that 70% of the total burden of the disease is attributed to tobacco smoking (which is the cause of death that can be almost entirely prevented). In a study contacted in 2004 (Tzanakis et. al., 2004) was found that among Greek smokers over 35 years old, 8.4% were suffering from COPD. The prevalence was higher in rural areas and among men.

Main cost driver of the COPD treatment, is inpatient care, in case of severe exacerbation. According the results of a study conducted in 2011 from Geitona et al., the cost for COPD patients hospitalized at ICU was estimated from € 1.711 to €2.614 /patient/exacerbation.

Managing patients suffering from COPD: status quo and problems.

- In general, geographical imbalances are reported concerning the provision of specialised respiratory services to patients suffering from COPD.Some patients experience repeated exacerbations due to the lack of a well organized referral system to specialized centers.
- Even the few specialized (on COPD) respiratory departments are facing staffing problems mainly concerning nurses.
- There are very few respiratory rehabilitation units operating (apart from Attica and Central Macedonia) and because of this, serious shortages of respiratory rehabilitation beds are reported.

Proposals for improving provided services to patients suffering from COPD

COPD can not be cured but can be prevented. Since the main cause is smoking (including passive exposure to it) the *effective prevention of COPD depends entirely on the effective tobacco control.* Preventing COPD is therefore the most effective way to reduce morbidity, mortality and related health expenditures. It includes smoking cessation and modification of conditions that contribute

to the occurrence of exacerbations of the disease through education, systematic physical motivation and learning self-care techniques. Therefore and considering that COPD is one of the main causes of mortality, a large increase in the prevalence of COPD is expected in the next decades in the country since Greece reports the highest proportion of heavy smokers and tobacco consumption in Europe, we concluded that it would be necessary *to create an organized National Action Plan to address, control and prevent COPD in order to reduce its impact both on the population and the NHS.*

Key objectives of the National Action Plan for COPD should be the early prevention through effective and systematic prevention programs, the early diagnosis, treatment and management of the disease, the effective, timely, organized and continuous patients' monitoring at all levels of care and the continuity of care and rehabilitation for all COPD patients.

Patients with COPD need regular monitoring and care by trained health professionals at primary health care level and specialized diagnostic and therapeutic care specialized health professionals at secondary and tertiary health care level. Our proposal *is to create a regional network for COPD at each Health District* as to facilitate cooperation among health services and health professionals and the consolidation of services where appropriate. In addition, networks for COPD will enable the harmonization among all health services and health professionals with the creation of national (and global) standards of prevention, treatment and rehabilitation of COPD patients. Special units of each COPD network at every health district will be able to qualify for specific range of services, the providers. This certification will also give a significant advantage both on national and on cross-border health care and will strengthen the medical tourism in the country.

Our detailed report includes specific detailed suggestions according to predefined operating criteria for each Health District and each hospital in the country concerning the reallocation of services, staff, departments and clinics, etc. in order to create both a district and a national network for COPD and to facilitate the coordination of services for COPD patients across the country. Our main suggestions for each Health District include the creation of more clinics for smoking cessation in all health regions, the creation of pulmonary clinics in primary health care organizations (IKA, OTA, etc), the development of home care services in all hospitals and health centers *and the strengthen of respiratory Rehabilitation Centers with* specialized health personnel (mainly nurses and physiotherapists, but also GPs, psychologists, etc)

3.4 Improving the efficiency in hospital sector: partnerships and cost containment measures

The two sectors of in patient care, public and private, have been grown with different aims and problems in their financing and provision of care. Our proposals for possible areas of joint practices, in a way of mutual benefits, include the following:

- The exploitation of the opportunities of Public Private Partnerships (PPP), in the Health Sector. Possible areas of joint action in the hospital area can range from construction ventures to hospital management and outsourcing.
- The partly usage of public inpatient care facilities from private health insurance, by disposing a number of beds and other special services- a practice which has already been announced and ministerial decision taken (19.08.2011), (until now 560 beds are provided for private use).
- The strengthening of the practice expected to be instituted by the new organization EOPYY regarding the contracted work with private providers: medical doctors, diagnostic centers and also private hospital services.

Moreover, apart from partnerships, it is necessary to be taken some expenditure containment measures such as:

- Completing the application of *double-entry* accounting system for the effective economic and financial management of hospitals and the implementation of analytical accounting systems.
- Upgrading the practice of publication of *economic statements* (income and expenditure) at hospital level, through ESY.net for evaluation and benchmarking. Enhancing and improving the Supply System for medical provisions and drugs, utilizing the "Prices Observatory" (observe.net) and promotion of the already proved as a success case the e-Auction and tendering.
- Developing and formalizing best practices for rational use of resources and economies of scale, in the networks of hospitals which have been emerged by applying the new structural change instituted by the Minister (re-organization and rationalization of the operation and management of hospitals).

3.5 The criteria for restructuring the public hospital sector

Most of the studies reviewed in a recent hospital merger study (Kristensen, Bogetoft, Pedersen, 2010) primarily used a pre-merger parametric, semi- or non-parametric DEA-approach to investigate the effect of mergers on productivity and cost efficiencies. In Greece, no empirical studies of potential economic gains from hospital mergers have been conducted, although the available evidence regarding hospital efficiency indicates that significant efficiency gains can be achieved (Aletras, 1999; Athanasopoulos et al., 1999; Athanasopoulos et al, 2001; Giokas, 2001; Kontodimopoulos et al., 2006; Aletras et al., 2007; Flokou et al, 2010). Whilst efficiency is obviously the predominant criterion in resource allocation and in the merging process as well, the sensitive nature of health and healthcare dictates that policy-makers equally value the usually contradicting (to efficiency) criterion of access equity. Moreover, in light of the current economic crisis in Greece, it is extremely important that any suggestions, which may eventually lead to hospital merger policy decisions, be fair, well justified and based on transparent criteria. For example, it would be contradicting the criterion of equity to limit the medical specialties available on a small island or to decrease the number of hospital beds, despite the fact that efficiency analyses results might be pointing in this direction. It is taken as axiomatic that the role of health care is to improve health and reduce access inequalities and that policy-makers concurrently seek the twin goals of efficiency and equity (Manyard, 1999; Sheldon & Smith, 2000). Although international experience is indeed an important factor to guide decision-making, the existing political and economical situation in Greece, in conjunction to an intense social turmoil, made it evident that the restructuring criteria adopted in the present study should rely less on technical and analytical tools, and more on various social, political, geographical and other peculiarities existing nationally and locally in Greece. Six distinct criteria, covering all aspects of hospital functioning, were considered. More specifically:

i. The *population* criterion. International experience, with adjustments, was the starting point. According to 2008 data (OECD Health Data, 2010 & 2011), the average number of general hospitals per 100.000 inhabitants in Europe, and in Greece separately, was 1.62 and 1.98 respectively, revealing a 22.2% difference. At that time the number of general hospitals in Greece was 222 (including small rural hospital-health centers, IKA and military hospitals and private hospitals / mixed clinics). These figures suggest an abundance of approximately 40 hospitals compared to the OECD average. By comparing only with "Mediterranean"

countries, i.e. countries with similar social, cultural, and geographic aspects, i.e. Italy, Spain, Portugal, Turkey and France, the above mentioned difference decreases to 10%, which is still considerable and suggests an abundance of approximately 20 general hospitals in Greece after adjustment for population differences. These figures are only a crude approximation of the number of general hospitals justified by the population criterion.

ii. The *catchment area* criterion. Greece is characterized by an extremely high population density in the greater Athens area, where approximately 40% of the country's population resides. A second densely populated area is Thessaloniki region with approximately 10% of the country's population. The rest of the population lives in smaller urban, semi-urban and rural areas. The average number of general hospitals per 100.000 inhabitants in the Athens area is 2.16, approximately exceeding the national average by +9.6%, in Thessaloniki 1.66 (-15.7%) and in the rest of the country 1.94 (+1.6%). Catchment area refers to the geographical area of permanent residents from which a hospital is expected to draw its patients and in a sense reflects accessibility as well. Twelve regions designated by EKAB, i.e. the National Service for Medical Transport, were adopted in the present study as respective catchment areas. This division is based solely on geographical and transportation criteria, as opposed to a recent legislative reform with an administrative division into 13 peripheries. To understand a hospital's contribution within its catchment area, a "coverage" index was calculated. Specifically, the percentage of cases handled by a hospital annually in respect to the cases handled in its catchment area was divided by the percentage of its beds in respect to the total beds of the catchment area. For example, if a hospital handled 33.8% of the cases in its catchment area, while accounting for only 28.4% of the beds in that area, the coverage index is 33.8% / 28.4% = 1.19. In other words, that hospital "carried" 19% more weight in its catchment area (i.e. more patients) than would be expected from the proportion of beds it owns. Hospitals with a coverage index < 0.90 were scored with -1, those between 0.90-1.10 with 0, and those exceeding 1.10 with +1, thus roughly forming tertiles, i.e. three evenly sized groups.

iii. The *size* criterion. Hospital size is typically measured by the number of beds available for treating inpatients. It is generally expected that larger general hospitals can more effectively cover the needs of the population in their catchment area. They attract patients with more complex conditions and expand the scope of their activities. It is also likely that larger hospitals tend to treat patients with more advanced and complex equipment. Producing services on a larger scale, though not necessarily linked to scale efficiency which is a different concept not addressed in this study, might imply that that a hospital is better prepared to serve its patients. For example, lower mortality can be expected for patients treated with coronary disease in a larger hospital which handles many similar cases, compared to a smaller hospital in which there might be an experience deficit. Furthermore, larger hospitals can attract specialized physicians and offer more medical specialties as well as better medical training. They typically provide better isolation of medically contagious cases due to the availability of specialized units, thus reducing in-hospital infections. Other advantages include fewer referrals to other hospitals and better management of outpatients and emergencies. Generally, hospital size is determined by considering factors such as catchment area, epidemiological profile, transportation infrastructure, proximity to other health facilities and local health hazards. With an aim of again forming tertiles in terms of the size criterion, hospitals with less than 125 beds were scored with -1, those with 125-300 beds with 0, and those with +300 beds with +1.

iv. The infrastructure *age* criterion. Hospital infrastructure in Greece was developed over the years according to historical, geographical and, to a large extent, political criteria. This, in

part, may explain the increased age of most public hospitals and the unsuitability of a large proportion of the respective facilities. It is noteworthy that the average age of the 117 public hospitals included in this study is 45 years, whereas the average age of a US hospital building is 27 years (Guenther & Vittori, 2007). Following the establishment of the Greek NHS, via the introduction of Law 1397/1983, there was an increase in and upgrading of infrastructure (buildings and medical equipment) and staffing, as well as improvements in quality and access to health care, especially in rural areas. Since then, new regional university hospitals in large urban areas, many prefectural hospitals in smaller cities and more than 200 health centers in rural areas have been built, while many existing facilities have been renovated or extended. The rationale in the present restructuring effort was to further strengthen the newer and more modern hospitals, and concurrently exploit the useable infrastructure of older ones. The latter were not to close down, but in many cases could be used differently, e.g. care units for patients with long-term illnesses or for elderly, and other such services currently provided by general hospitals, thus relieving them of the respective physical and financial burden. Infrastructure age was determined via a questionnaire sent to the regional health authorities supervising the hospitals. Response rates were slow and large portions of the data were missing and incomplete, hindering the process. Furthermore, most hospitals had undergone multiple renovations in some of their facilities over the years, making it extremely difficult to designate a unique age for each. Eventually, 46 hospitals were classified as "relatively new" (opening after 1985), 37 hospitals as "middle-aged" (1960-1985) and 34 hospitals as "old" (before 1960), and were scored +1, 0 and -1 respectively.

v. The *utilization* criterion. The purpose of this criterion was to measure how well each hospital exploited its facilities and resources for treating inpatients. Two commonly used indices for measuring hospital utilization and capacity were selected:
   - Patient *throughput which* is expressed as the average number of patient discharges per available hospital bed per annum.
   - Bed *turnover interval* which is the average number of days a hospital bed remains unoccupied between admissions.

   Both indices were given equal weight and patient throughput and bed turnover interval were calculated for each hospital. For each index, hospitals were sorted from best to worst (i.e. descending throughput and ascending turnover) and were categorized into tertiles scored respectively +1, 0 and -1. Hence, each hospital was allocated two marks which were summed to provide an overall score between -2 and +2. This was regarded as an "intermediate" score and was transformed for comparability with the other criteria mentioned previously as follows: an intermediate score of -2 or -1 was given a final score of -1, an intermediate score of 0 was given a final score of 0 and an intermediate score +1 or -+2 was given a final score of +1.

vi. The *cost* criterion. Although consensus on the appropriate unit of hospital output (hospital case vs. patient days) is not always apparent, efficiency of hospital services has traditionally been measured by simple economic indices of both outputs (i.e. cost per day and cost per patient). Despite providing straightforward information about performance such indices are indeed limited by some obvious shortcomings, such as one input and output, the need to incorporate relative weights and the difficulty to explain the behavior of individual hospitals when ranking efficiency across many hospitals. For these, and other, reasons multiple input-output parametric and mostly non-parametric methods have prevailed in efficiency analyses. Moreover, hospitals provide services to cases that differ in terms of complexity and severity of illness and to deal with this, researchers have typically incorporated general diagnostic groups

(such as Diagnosis Related Groups -DRGs) in their models. In Greece, the ministry of health plans to change the hospital payment method in the future; however, it has not yet been decided how the change will be introduced or whether it will involve the expansion of DRGs or the introduction of global budgets [17]. In the present study, the two abovementioned indices and cost per bed were used as three crude approximations of the economic performance of each hospital. All costs incurred in hospital functioning were considered, e.g. pharmaceuticals, consumables, reagents and all other materials, for inpatients and outpatients (including day surgeries, dialysis, chemotherapies). However staff salaries, despite constituting the largest portion of hospital cost, were not included as they are covered centrally by the state budget and do not burden the hospitals themselves. Furthermore, as hospital management has no control over staff hiring (or firing), a basic principle of the present restructuring effort was that proposals would only involve some staff reallocation and not in any case reductions. Therefore, we decided to focus only on controllable costs. Cost per case, cost per day and cost per bed was calculated for each hospital and given equal weight. Hospitals were sorted from best to worst by each index (i.e. ascending costs) and were categorized into tertiles scored respectively +1, 0 and -1. Hence, each hospital was allocated three marks which were summed to provide an overall score between -3 and +3. As in the previous criterion, this was regarded as an "intermediate" score and was transformed as follows: an intermediate score of -3 or -2 was given a final score of -1, an intermediate score of -1, 0 0r +1 was given a final score of 0 and an intermediate score +2 or -+3 was given a final score of +1.

The scores for criteria ii to iv were summed and each hospital was allocated a final score ranging from -5 to +5. It should be noted that the overall score serves the purpose of informing on possible weaknesses encountered in each hospital, which should be seen as priorities by management for potential improvements. It also assisted the study group in the formulation of reasonable suggestions for improving the health services in each hospital. It is emphasized that no restructuring suggestions were based solely on the individual score of a particular hospital.

4. A novel way to conduct a study

From the very beginning it was clear that a study of this nature was going to be used for wide public debate among the many stakeholders in the health system, regional stakeholders, professional interested parties, and ultimately for policy formulation. It, therefore, had to answer to certain preconditions in order for it to be useful. As hospital mergers have been known by European experience to be rather sensitive political subjects on a regional basis (Tsavalias et al., 2011), the study parameters could be disseminated early and widely, but the detailed proposals by health region should not be made public until the time of public debate by region. Second, the difficulties of collecting the relevant data, which in many cases were not readily available, compiling them, creating the necessary indices, and come up with policy suggestions in the time frame of 3 months, made the presentation of a printed document impossible. Third, the need to have many people, from different parts of the country, working on different sections simultaneously made distance working essential. Fourth, the need to have as much time available for last-minute adjustments and/or corrections, made it essential that the "text" could be changed even on the last day before presentation. Lastly, the study audience was understood to be very diverse, and the desire to go into detail could vary considerably. The Report, therefore, should

make it easy for everybody to go to the results or proposals of their interest immediately, and print anything, but, at the same time make all the information by which the given results or proposals were obtained, available to the interested party. All these considerations pointed to the need for the Study to be conducted in the form of a website, to which the study team could add information continuously, under the exclusive approval of the study coordinator who had the exclusive right of publication. In this way, we were able to finish the study in the period of 3 months, to present the results in a very functional way, and to use and present information, data, and analysis which, if printed, would require more than 400 pages. The website http://platon.cc.uoa.gr/~reconweb/new2/ is available (in Greek) at the main site of the Department of Nursing, University of Athens, where most of the Study team members teach or collaborate with the Center for Health Services Management and Evaluation (CHESME).

Notes

1. The only occasion on which hospital directors were appointed by a board of high-ranking public servants, on the basis of a CV, was during the period 2001-2004 under Law 2889/2001, passed by Minister Al. Papadopoulos, who also introduced the Regionalization of the Public hospital sector.

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