

IMPACT OF ECONOMIC CRISIS ON GREEK NATIONAL HEALTH SYSTEM: NEW DISTURBING EVIDENCE FROM A SAMPLE SURVEY AMONG PATIENTS IN GREEK PUBLIC HOSPITALS

Christos C. Frangos, Technological Educational Institute of Athens, Dept. of Business Administration,
e-mail: cfragos@teiath.gr

Constantinos C. Frangos, University College, London, Department of Medicine,
e-mail: Constantinos.Frangos.09@ucl.ac.uk

Sotiropoulos Ioannis, Technological Educational Institute of Athens, Dept. of Auditing and Finance,
e-mail: sotiropoulosioan@yahoo.gr

Litsi Christina, Technological Educational Institute of Athens, Dept. of Business Administration
e-mail: afro_litsi2@hotmail.gr

ABSTRACT

The Greek National Health System (GNSH) has been established in 1983. Its purpose was the free provision of medical and hospital treatment to the population of Greece through the establishment of Centers of Health in every part of the Greek State. We investigate through a sample survey among 1393 patients the degree of satisfaction of Greeks for their National System as well as the factors which contribute to the inefficiency of the services of the Greek National System of Health, in the context of the present economic crisis.

An Exploratory Factor Analysis was carried out and it has identified the following main factors of inefficiency of GNSH:

(a) Shortage of medical doctors and fully equipped medical centers in the Greek islands and remote areas. (b) Corrupt dealings of medical doctors with patients in order to have prompt medical assistance. (c) Corrupt dealings between Medical administrators and pharmaceutical companies. (d) High cost of medical services and medicines provided by GNSH. (e) Inefficiency and loose functioning of the System of National Medical Emergency Services (EKAV).

A Binary Logistic Regression reveals that the following factors of dissatisfaction with GNHS : Shortage of medical Doctors, Corruption in the areas of medical services and Medicines, High cost of Services and Inefficient service of (EKAV), are statistically significant at the 0,05 level of significance.

Key Words: Greek National Health System (GNHS), Logistic Regression, Public Healthcare in Greece.

1. Introduction and literature review

Since October 2009, Greece has been undergoing a severe economic crisis due to a debt of 330 billion Euro which the previous governments have been accumulating on the Greek Economy with their mismanagement. This Crisis has led to the signing of the Memorandum of Economic and Financial policies ("Mnimonion") with the three lenders: the International Monetary Fund (IMF), The European Commission (EC) and the European Central Bank (ECB) in exchange of a 110 Billion Euro loan, initially. The loan has been given under strict austerity conditions which led to a rise of unemployment to 25 %, to the reduction by 20% of the Greek Gross Domestic Product (GDP) and to disturbing socioeconomic consequences in every sector. The Greek National Health System (GNHS) has been affected badly in the following two areas (Economou, 2010), (Kentikelenis et al., 2012), (Simou and Koutsogeorgou, 2013):

- a. General population Health (GPH), which includes : Mental Health, Suicides, Epidemics, Eating Disorders.
- b. Public Healthcare , which includes : Public health expenditure and Management, Healthcare workforce and services, Pharmaceutical market and Biomedical research.

1a. Public Health Expenditure and Management

The Ministry of Health (MoH) has introduced the following measures since the beginning of the crisis, seeking to reduce public expenditure on healthcare : a. the merging of four of the largest social security organizations under the National

Organization for the Provision of Healthcare Services (EOPYY). b. cutting Medical Doctors' and Nurses' salaries.

c. implementing a Diagnosis-Related Group (DRG) system of payments d. introducing the electronic prescription system e. reducing the price of medicines and medical supplies by introducing more transparent practices and f. limiting recruitment of medical Doctors and other health personnel, (Fragkoulis, 2012) and (Polyzos et al, 2013).

1b. Healthcare workforce

The salaries of the medical personnel have been cut by 15% initially and the pensions by 10%. Today the GNHS operates with 10-40% fewer medical workers whose salary has been cut by 30-40%. (Pavlopoylos, 2012), (Karatzanis et al, 2012).

1c. Healthcare Services

The Primary Health Care (PHC) and the University Hospitals have been affected badly by the economic crisis with respect to staffing and medical equipment. (Falagas et al, 2012). According to some researchers

(Zavras et al, 2013), (Emmanouilidou and Bourke, 2013),

the cost of services, the waiting time for the admission to hospital, the limited access to healthcare, the travel distance to public health centers, have been some disturbing issues of GNHS and a constant obstacle to the provision of Public medical services in Greece (Vandoros et al, 2014).

These issues are examined in this paper through a sample survey among 1393 patients in Greek public hospitals . The respondents' answers are statistically analyzed in the following sections.

1d. Pharmaceutical market

During the last decade the pharmaceutical expenditure has increased more than threefold with the pharmaceutical expenditure per capita being less than 200 Euro in 2000, whereas in 2008 it was 700 Euro (Vandoros and Stargardt, 2013). The government imposed reductions in pharmaceutical prices in order to reduce costs. Specifically, it imposed wholesale margin profit and decreased the price of generic medicines ("genosima") (at 90% of original medicines' prices). It increased, also, the value-added tax (VAT). These increases, along with the frequent strikes of pharmacists have caused a wide dissatisfaction of the public to the government and to GNHS in particular.

1e. Informal payments and clientism in the dealings between Medical Doctors, patients, politicians, Hospital administrators and pharmaceutical companies.

In an important paper (Liaropoulos et al, 2008), describe the ways of informal payments ("fakellaki", small envelope in Greek) (Brian-Abel Smith et al. ,2004) to the Medical Doctors from patients who were afraid of receiving substandard care (if they did not pay) or because the Doctors were demanding such a payment. They estimate that the probability of extra payments is 72% higher for patients aiming to "jump the queue" compared to those who were following the regulations. They estimate, further, that 42% of patients have given to doctors

informal payments. Hence, informal payment is like an ugly flower which is growing in the fields of GNHS, and the existence of economic crisis multiplies its numbers continuously.

The hospital administrators purchase medicines and medical equipment at inflated prices from pharmaceutical companies and they are getting monetary gifts and trips abroad, whereas the politicians are hiring administrative and medical staff without qualifications, only with the promise to vote for them in future elections.

1f. The need for a sample survey exploring the feelings of patients towards GNHS

In this paper we present a sample survey among patients in a panhellenic basis in order to achieve the following:

- To examine the consistency of survey estimates of patients' satisfaction or not with the different characteristics of the GNHS functions with interpersonal aspects of hospital experience.
- To assess the influence of gender, age, marital status, income and social insurance type of a patient on the degree of his or her satisfaction with the GNHS.
- To monitor the performance of the units of GNHS and to stimulate improvements in the healthcare system.

2. Methods

2.1 Sample and Procedure

We have carried out a sample survey among 1393 patients who were treated in public hospitals operated by GNHS in Greece, trying to identify the factors of dissatisfaction with GNHS. 808 respondents were women and 585 were men. Their age was as follows: 556 were 17-29 years of age, 283 were 30-39 years of age, 240 were 40-49 years, 170 were 50-59 years of age and 144 were more than 59 years of age. Most of the patients (1302) were Greek, 41 patients were from Albania, 8 from Romania, 5 from Bulgaria, 6 from Western Europe countries or from North America and the rest from African Countries. The statistical analysis of the questionnaires has been carried out with the help of Statistical Package for the Social Sciences (SPSS) 21.0, (Pallant, 2007).

3. Statistical Analysis

3.1. χ^2 tests of independence

We perform χ^2 tests of independence in order to test the hypothesis:

H0: The variable :Are you satisfied from the quality of health care which is provided by the GNHS?

Is independent of the variable V_K ,

where

V_K ($K=1, \dots, n$) is a demographic variable or a variable related to the problematic areas of GNHS, as they have been described in section 1.

H1: The variable: Are you satisfied from the quality of health care which is provided by the GNHS?

Is dependent on the variable V_K ,

The following table shows the results of the χ^2 tests :

Table 1. χ^2 tests of independence. χ^2 statistic, Degrees of Freedom, p-value, Level of significance: 0,05.

Variable V_K	Variable V: Are you satisfied from the health care services of GNHS?	χ^2 Statistic	Degrees of Freedom	p-value
Demographic				
1. Gender		16,9	6	0,012
2. Income		133,3	6	0,002
3. Profession		45,4	6	0,332
Highest degree obtained		157,6	6	0,001
Type of health insurance provider		45,2	6	0,006

Problematic areas of GNHS				
Shortages of workers, centers, instruments				
1. Shortage of well equipped Centers of Health	158,5	12	0,0001	
2. Shortage of Centers of Health in islands and in not easily accessible areas	157,5	6	0,0001	
3. Shortage of Diagnostic Centers equipped with modern medical instruments	176,8	12	0,0001	
4. Shortage of Medical Doctors and Nurses	165,2	6	0,0001	
5. Treatment of patients with chronic diseases	47,7	6	0,0001	
6. Shortage of Units of Intensive Care	94,7	6	0,0001	
7. Excessive cost of Medical and pharmaceutical services	72,9	12	0,0001	
Corruption, clientism, overpricing of services				
8. Hiring of health workers by political party affiliations criteria	96,3	6	0,0001	
9. Non existent real postgraduate seminars for Doctors	75,3	6	0,0001	
10. Existence of corrupt dealings of management in hospitals and pharmaceutical companies for provision of overpriced medicines and machines ('promithia', 'grigosimo')	172,2	6	0,0001	
11. Illegal informal payments "fakellaki" from patients to doctors for providing efficient and fast services	176,2	6	0,0001	
12. Insufficient participation of EOPYY to medical expenses	146,3	6	0,0001	
13. Introduction of Electronic prescription system	43,3	12	0,0001	
14. Delays in arriving of EKAV ambulances to homes of patients to carry them to hospital	119,1	6	0,0001	
15. Waste of medicines and medical equipment due to bad management	395,9	6	0,0001	

It is interesting to note that in 13 women the 12 ones have the opinion that there are taking place informal illegal payments ("fakellaki") from patients to doctors to do their duty reliably and fast ("grigosimo"). The correspondent ratio for men is 1 in 9.

3.2. Factor Analysis

The 15 items of the Questionnaire for identifying the problematic areas of GNHS causing dissatisfaction to patients, which are shown in Table 1 were subjected in Principal Component Analysis (PCA) using SPSS Version 21. Prior to performing PCA, the suitability of data for Factor Analysis was assessed. Inspection of the Correlation matrix revealed the presence of many coefficients of .5 and above. The Kaiser-Meyer-Olkin value was 0,873, exceeding the recommended value of 0,6 (Kaiser, 1970, 1974) and Bartlett's Test of Sphericity (Bartlett 1954) is 4749,1 reaching statistical significance, supporting the factorability of the correlation matrix.

Principal Components Analysis revealed the presence of five components with eigenvalues exceeding 1, explaining 23,7%, 6,9%, 6,4%, 5,9% and 5,2% of the variance respectively.

We name the five components as follows: Corrupt Practices in GNHS, Inferior Postgraduate Education for Doctors, Shortage of Medical Doctors, Nurses and Medical Centers, Exorbitant cost of medical treatment and improper conditions of patient examinations at outpatient clinics.

Table 2, shows, the factors, the variables which belong to each factor and all the dimension coefficients:

Table 2. Pattern Matrix for PCA with Oblimin Rotation of five Factor solution of the Questionnaire variables, with factor loadings of each of the variables

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
F1. Corrupt practices in GNHS					
Unlawful payment(fakellaki) from patients to Medical Doctors in order to have prompt medical care	.64				
Shortage of Integrated and fully Equipped Centers of Health in the Greek Islands and in not easily accessible areas	.60				
Corrupt relation between some Pharmaceutical Companies, Heads of Hospitals, Medical Doctors and Politicians	.52				
F2.Inferior Postgraduate Education					
Shortage of Real further Postgraduate Education of Medical Doctors		0,77			
Tendency to hire Medical and Nursing Personnel according to Political Party affiliation		0,72			
F3. Shortage of Medical Workforce and Medical Hospitals and Clinics					
Shortage of Medical and Nursing Personnel			0,75		
Shortage of properly educated Medical Personnel			0,69		
Shortage of a sufficient number of units of Intensive care			0,59		
Shortage of Integrated and fully Equipped Centers of Decease Prevention			0,58		
F4. Exorbitant cost of medical treatment					
Problematic treatment of patients suffering from chronic deceases				0,65	
High cost of medical and pharmaceutical services				0,59	
F5. Improper examination of patients					
Public Medical examination of patients in the emergency Clinics Of GNHS					-0,85
Inadequate updating of patients in the corridors of a hospital without any sort of privacy					-0,79

3.3 Logistic Binary Regression

Direct Logistic Regression was performed to assess the impact of a number of factors on the likelihood that respondents would report that they were satisfied from the services of GNHS. The model contained seven independent variables(Shortage of Integrated and fully Equipped Centers of Health in not easily accessible areas and in the islands, Shortage of sufficient and well paid Doctors and Nurses, Corrupt relationships between Doctors, Hospitals, Politicians and pharmaceutical companies, Illegal informal payments(“fakellaki”) by patients to Doctors, Insufficient participation of EOPYY to medical expenses, Improper examination and updating of patients in the corridors of hospitals and considerable waiting time by EKAV to take and bring to the hospital an emergency case). The dependent variable is: Satisfaction of patients from the services of GNHS. The full model

containing all predictors was statistically significant, $\chi^2(10, N=1318)=347,08$, $p<0,0001$, indicating that the model was able to distinguish between respondents who reported and did not report that they were satisfied from GNHS. The model as a whole explained between 23,9% (Cox and Snell R Squared) and 36,1% (Nagelkerke R Squared) of the variance in frequency of satisfaction cases from GNHS, and correctly classified 83,1% of cases. The Hosmer and Lemeshow test (9,35 with 6 degrees of freedom, $p=0,15$) is showing a good fit of the model. As shown in the following Table 3 all seven independent variables made a unique Statistically significant contribution to the model (Satisfaction or not from the services of GNHS).

Table 3. Logistic Regression Predicting Likelihood of patients' satisfaction from services of GNHS

INDEPENDENT VARIABLE	B	WALD TEST	DF	p	EXP(B) Odds Ratio	95% C.I. For Odds Ratio	
						Lower	Upper
Shortage of Integrated and fully Equipped Centers of Health in not easily accessible areas and in islands	-20,1	0,001	1	0,99	0,43	0,30	0,60
Shortage of sufficient and well paid Doctors and Nurses	-0,84	24,73	1	0,01	0,47	0,30	0,75
Corrupt relationships between Doctors, Hospitals, Politicians and pharmaceutical companies	-0,73	9,9	1	0,02	0,39	0,24	0,66
Illegal informal payments ("fakellaki") by patients to Doctors	-0,92	12,30	1	0,01	0,44	0,31	0,62
Insufficient participation of EOPYY to medical expenses	-1,1	39,32	1	0,002	1,50	1,08	2,1
Improper examination and updating of patients in the corridors of hospitals	0,40	5,85	1	0,98	0,30	0,18	0,42
Considerable waiting time by EKAV in emergency cases	-18,1	0,001	1	0,001	0,55	0,39	0,71
Constant	2,73	83,1	1	0,001	15,47	11,3	19,2

3.4 Discussion

The results of this paper added to the growing body of evidence indicating that the causes of dissatisfaction with the health care provided by GNHS are both due to shortages of Health centres and medical staff in not easily accessible areas and the islands, the endemic Corruption practices between the managers of the Hospitals and pharmaceutical companies and between the patients and medical staff in order to have fast service ('grigorosimo') and proper treatment. The delays caused by the EKAV system in transporting emergency cases to hospitals are worth mentioning because they contribute significantly to the general dissatisfaction. An important step towards reducing the cost and eliminating the corruption practices is the establishment of the electronic prescription system.

The new finding of this paper is that the lack of proper examination rooms for the emergency cases and the treatment of patients in the general view is a very unpleasant picture of a public hospital which contributes to the general miserable picture of shortages. Also, the lack of organizational qualities of GNHS contributes to significant corruption practices and waste of resources. Today, in Greece, there is a considerable shortage of staff due to the economic crisis and there is also a health crisis because of severe shortage and inequalities of medical staff.

Table 4, shows the percentages of answers of the 1393 respondents with respect to the functions and conditions of healthcare provided by the the GNHS:

Table 4. Percentages (N;%) of the answers of respondents as regards problematic characteristics of GNHS. N=1393 respondents

Problematic Area of Functioning of GNHS	Percentage of accepting the existence of the problem by respondents (Answer 'YES')	Percentage of rejecting the existence of the problem by respondents (Answer 'NO')
F1. Corrupt practices in GNHS		
Unlawful payment(fakellaki) from patients to Medical Doctors in order to have prompt medical care	91,1	8,9
Shortage of Integrated and fully Equipped Centers of Health in the Greek Islands and not easily accessible areas	89,8	10,2
Corrupt relation between some Pharmaceutical Companies, Heads of Hospitals, Medical Doctors and Politicians ('promithia', 'grigorosimo')	87,8	12,2
F2. Inferior Postgraduate Education		
Shortage of Real further Postgraduate Education of Medical Doctors	74,7	25,3
Tendency to hire Medical and Nursing Personnel according to Political Party affiliation	76,3	23,7
F3. Shortage of Medical Workforce and Medical Centers		
Shortage of Medical and Nursing Personnel	76,8	23,2
Shortage of properly educated Medical Personnel	69,5	30,5
Shortage of a sufficient number of units of Intensive care	80,5	19,5
Shortage of properly equipped Diagnostic Centers	79,3	20,7
Shortage of Integrated and fully Equipped Centers of Disease Prevention	80,8	19,2
F4. Exorbitant cost of medical treatment		
Problematic treatment of patients suffering from chronic diseases	58,8	41,2
High cost of medical and pharmaceutical services	82,9	17,1
F5. Improper examination of patients		
Public Medical examination of patients in the emergency Clinics of GNHS, in the eyes of many people	64,8	35,2
Inadequate updating of patients in the corridors of a hospital without any sort of privacy	68,8	31,2
F6. Medical Equipment, Drugs, EKAV, EOPYY		
Shortage of Modern Medical Equipment	78,2	21,8
Introduction of Electronic Prescriptions system to fight corruption	62,6	37,4
Considerable waiting time for EKAV AMBULANCE to Transport aa emergency case to hospital	75,3	24,7
Considerable waste, because of disorganization ,of drugs, resources, instruments	86,3	13,7
Insufficient coverage of medical expenses by EOPYY	75,7	24,3
F7 . Salary of medical and nursing personnel		
Cuts in salary and overtime pay of medical and nursing personnel	78,8	21,2
F8. Satisfaction from the healthcare provided by GNHS		
Did you use the services of GNHS during the past twelve months?	83,2	16,8
Are you on the whole satisfied from the healthcare provided by the GNHS?	24,1 (answer: YES)	75,9 (answer: NO)

3.5 Policy Implications

Important policy measures which must be taken by the Ministry of Health (MoH) in order to reduce the level of dissatisfaction of patients with the GNHS are the following:

- a. Increase of control and audit mechanisms within the GNHS.
- b. Impose severe penalties to the persons who are caught blackmailing patients and officials having underground dealings with service providers.
- c. Transparency in the system of hiring medical staff.

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