

# The Effects of Elimination of Gate-Keeping on Tertiary Care and the Social Insurance System

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## ABSTRACT

The aim was to investigate the effects of elimination of gatekeeping on a university hospital and Social Insurance Institute (SII). Electronic records of 2006-2007 were analyzed. The mean outpatient visits was 273.8±69.9 before the gate-keeping elimination, it was 471.8±114.7 after the gate-keeping elimination ( $p<0.001$ ). The increased rate of visits were in the department of cardiology (95.4%) followed by respiratory medicine (33.3%), orthopedics (22.6%), neurology (16.1%) and gynecology (11.4%). Also the most frequent diagnoses changed in these departments. The most frequent diagnoses before and after elimination were as follows; hypertension in comparison to anxiety disorders after elimination in cardiology, chronic obstructive lung disease compared to myalgia in respiratory medicine, fracture follow up compared to joint pain in orthopaedics, epilepsy compared to dizziness in neurology and infertility compared to vaginitis in gynecology. SII has paid 10.67 fold higher dues after elimination for these 7 departments and diagnoses. Consequently; elimination of the gate-keeping can easily be applied to tertiary care and can increase health expenditures.

**Key Words:** Gate-keeping, university hospital, health expenditures

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## Introduction

Authorization of referrals from primary care to secondary care specialists by a designated primary care provider is commonly referred to as gate-keeping (1). Gate-keeping has been considered essential because of evidence that unrestricted access to specialists induced a demand for costly and sometimes unnecessary services (2, 3). This could lead to increasing the possibility that diagnostic and therapeutic procedures will be applied inappropriately (4). Cost arguments aside, primary care gate-keeping provides an important filter to specialist care (4). Incentives and penalties for physicians acting as gatekeepers can reduce the cost of ambulatory services by limiting specialist visits (5).

Gate-keeping systems have emerged in countries with scarce medical resources and have developed in countries with a limited supply of specialists. At issue is how to manage patient demand for specialist care in a healthcare environment rich in specialists that promotes expectations for direct access and reliance on invasive technologies over less invasive primary care interventions (4).

Health care all over the world is continuously reforming with time. Health care reform has become an increasingly important agenda for policy change in both developed and developing countries, including Malaysia (6) In 1998, European countries with a gate-keeping system spent less on healthcare as a percentage of their gross national product

than those that allowed direct access to specialists (7.9%-8.6%) (7, 8). On the other hand, in 2006, IPI (Institute for Policy Innovation) found a significant link between compulsory referrals to general practitioners (GPs) and long waiting lists. The official justification for gate-keepers is that it reduces costs, however, the study of IPI has shown that there is no evidence to support this assertion; systems with direct access to specialists are no more costly than others (9).

While in the Scandinavian countries, UK and Germany, patients need a referral from their (primary care) general practitioners (GPs) to obtain access to a hospital or to a specialist, in the U.S., some health maintenance organizations (HMO) have relaxed the restrictions on access to specialists (10).

Although the gate-keeping role of the general practitioner was first described in Turkey in the law named Socialization of Health Care (no:224), in 1963 (11), it could not be appropriately applied (12). In Turkey, the gate-keeping system was eliminated in two stages:- in April, 29<sup>th</sup> 2006 for officers and their families who reside in that municipality area (first intervention), and then in June, 15<sup>th</sup> 2007 for all members of the general Social Insurance Institute (SII) (excluding patients with Green cards and patients coming from another municipality area (second intervention).

The aim of this study was to investigate the effects of the elimination of the gate-keeping for patients admitted to the university hospital outpatients, and the costs to SII.

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## Methods

### Descriptions

**Study Center:** The University Hospital where this study was carried out is located on the Eastern Mediterranean coast of Turkey and serves a population of more than a million. It was founded in 2003.

**Social insurance institutions in Turkey:** Health insurance was provided by five different governmental organizations. These are; Emekli sandığı (Pension Fund for Civil Servants: This is a Government Employees Retirement Fund for retired civil servants, it also includes health insurance), SSK (Social security organization: This is a social security institution for private sector and blue-collar public sector workers) and Bag-kur (Social security institution for the self-employed: This institution covers the self-employed including craftsmen, artisans and small businessmen, technical and professional people who are registered to a chamber or professional association, shareholders of companies other than co-operatives and joint stock companies, and self-employed in agriculture). The health expenditures of the members of the above mentioned three different social insurance systems were provided by SII. The other is the Greencard System. This system is for poor people earning less than a minimum level of income which is defined by the law, who are provided with a special card giving free access to health care. In addition, health expenditures of officers in the public sector (government employee) are financed with the funds from the general budget. There are also out of pocket payments, and private health insurance.

**The first intervention to gate-keeping:** Elimination of gate-keeping for government employees in the public sector and their parents in April 29<sup>th</sup> 2006.

**The second intervention to gate-keeping:** Elimination of gate-keeping for members of SSK and Bag-kur in June 15<sup>th</sup> 2007.

**Fixed-payments for outpatient visits in 2006-2007:** SII pays 11 Turkish Lira (TRL) for each outpatient in primary health care, while the price for outpatients differs according to specialties in tertiary health care (University Hospital) For example, SII pay 61 TRL for gynecology, 56 TRL for cardiology, 55 TRL for internal medicine, physical medicine and rehabilitation, general surgery, neurosurgery, plastic and reconstructive surgery and urology, 51 TRL for neurology, 49 TRL for respiratory medicine, pediatric surgery, cardiovascular surgery and orthopedics and traumatology, 44 TRL for pediatrics 43 TRL for Ear-Nose-Throat, 41 TRL for dermatology and 36 TRL for ophthalmology, psychiatry. SII also pays extra for some special procedures.

### Analysis

In this cross-sectional analytic study, the electronic medical records of Mustafa Kemal University hospital of a 23 month period, starting in January 2006 and ending in November 2007, were retrospectively analyzed. Records were obtained for a total of 167215 outpatients over this period.

Differences in the mean visit numbers on the work days before intervention, after the first and after the second interventions to a gate-keeping system were analyzed using one

way ANOV. These analyses were then made according to the patient's social security type.

Also, visit rate according to departments were calculated before and after the intervention in the SSK members group, because second intervention affected SSK members group. The ratio of increase of visit rate was measured by finding the proportion between the visit rates before and after the elimination of gate keeping. Three main outcome measures were analyzed: the most frequent diagnosis and changes after interventions according to departments, frequencies and costs of these diagnoses.

These costs were calculated using the fix-payment prices for departments of the University Hospital. The costs of these diagnoses were then calculated and compared using the fix-payment prices for primary care. SPSS 11.5 version was used in statistical analysis, p-value <0.05 was accepted as statistically significant.

## Results

Between January 2006-November 2007 (23 months period), 167215 patients were admitted to the hospital. Of these admissions, 12.4% (20.857) were made in the first 4 months, 50.0% (83.563) were during 13.5 months after the first intervention, and 37.6% (62.795) were during the last 5.5 months. The mean age was  $42.5 \pm 35.3$  years; 60.7% (101.499) were female and 39.3% (65.716) were male patients. The mean outpatient visits in workdays was  $256.8 \pm 45.9$  before intervention to gate-keeping system, it was  $273.8 \pm 69.9$  after first intervention to gate-keeping system ( $p=0.335$ ). However, it was  $471.8 \pm 114.7$  for second intervention to gate-keeping system ( $p<0.001$ ) (Figure 1).

The mean visits of patients with SSK in a workday to the hospital as outpatients was  $41.6 \pm 19.9$  before second intervention to the gate-keeping system and  $158.2 \pm 33.9$  after this intervention ( $p<0.001$ ). Similarly, these data for patients with

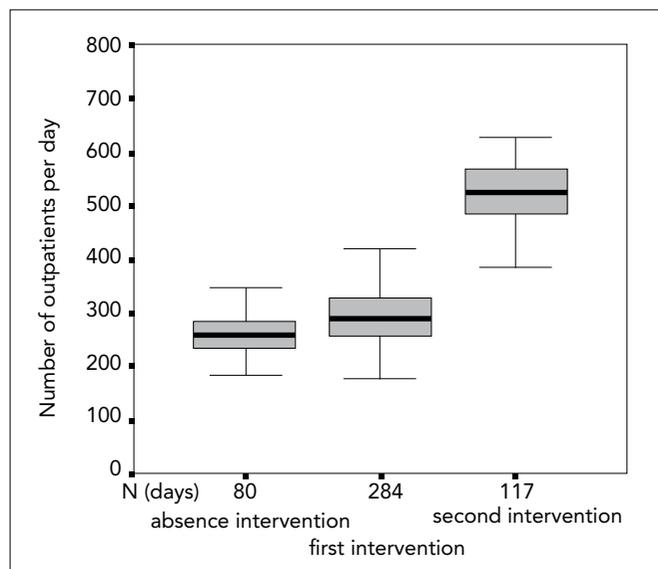


Figure 1. The relation of the gate keeping to the number of patients visiting a university hospital

Bag-kur were  $2.4 \pm 3.0$  and  $105.9 \pm 66.2$ , respectively ( $p < 0.001$ ). The mean visits of patients with green cards who weren't affected by both interventions were  $18.2 \pm 6.9$ ,  $25.1 \pm 15.4$  and  $35.7 \pm 19.2$ , respectively ( $p < 0.01$ ).

Figure 2 shows the changes in the number of visits of patients with different social insurances according to months in 2006-2007.

It was determined that rates of applications of patients with SSK increased in ten departments after the second intervention to gate-keeping. The highest increase in the rate of visit was observed in the department of cardiology (95.4%). This was followed by cardiovascular surgery 45.2%, respiratory medicine 33.3%, orthopedics 22.6%, physical medicine-rehabilitation 18.3%, neurology 16.1%, pediatric surgery 14.2% and gynecology 11.4% (Table 1). On the other hand, it was determined that rates of application decreased in six departments during the same period.

In the department of cardiology and during the first period before the second intervention, the most frequently diagnosed illness was essential (primary) hypertension (International Classification Disease (ICD) code is I10.01), meanwhile the anxiety disorder (ICD code is F41.9) was the most diagnosed illness in the second period after the second intervention (Table 2). The proportions of essential hypertension and anxiety disorders were 18.9% and 20.0%, respectively. The increased rates of visits, proportion of diagnosis for both periods and most frequently diagnosed illnesses in other departments are also shown in Table 2. In the departments of cardio-

vascular surgery, general surgery and physical medicine and rehabilitation, the most frequently diagnosed illnesses were similar in both periods.

In addition, we compared the most frequently diagnosed illness in the second period with the same illness with regard of numbers and proportions in the first period for each department (e.g. anxiety disorder was 2.2% (6 patients) in the first period and 20.0% (183 patients) in the second period departments of cardiology, myalgia was 0.9% (2 patients) in the first period and 14.3% (72 patients) in the second period in respiratory medicine (Table 3).

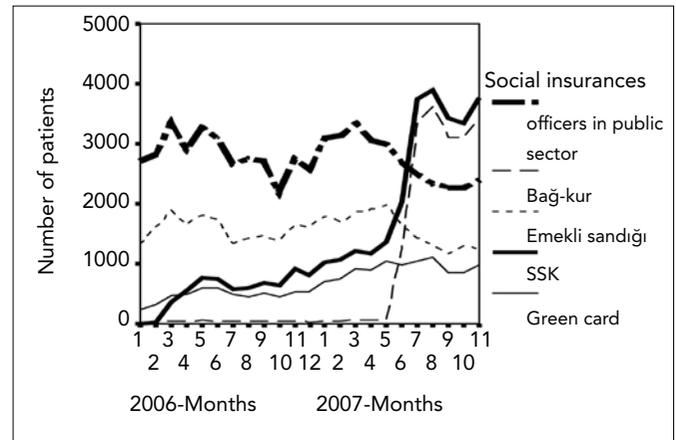


Figure 2. Number of patient by months according to social insurances (2006-2007)

Table 1. Effects of elimination of Gate-Keeping on outpatient visit rates in SSK members

Departments	Gate-keeping (17.5 months) (n=9937) Visit no (%)	No Gate-keeping (5.5 months) (n=17702) Visit no (%)	Ratio of increase of visit rate (%)
Cardiology	262 (2.6)	913 (5.2)	95.4
Cardiovascular surgery	48 (0.5)	127 (0.7)	45.2
Respiratory Medicine	202 (2.1)	503 (2.8)	33.3
Orthopedics	1230 (12.4)	2697 (15.2)	22.6
Physical Medicine and Rehabilitation	598 (6.0)	1257 (7.1)	18.3
Neurology	552 (5.6)	1152 (6.5)	16.1
Pediatric surgery	73 (0.7)	142 (0.8)	14.2
Gynecology	874 (8.8)	1743 (9.8)	11.4
General surgery	495 (5.0)	960 (5.4)	8.0
Urology	498 (5.0)	899 (5.1)	2.0
Dermatology	1144 (11.5)	1146 (6.4)	-43.8
Brain surgery	682 (6.8)	920 (5.2)	-24.3
Ophthalmology	722 (7.3)	1125 (6.4)	-12.3
Ear, nose and throat	821 (8.3)	1342 (7.6)	-8.3
Infectious diseases	211 (2.1)	351 (1.9)	-7.0
Internal medicine	1170 (11.7)	2076 (11.7)	-0.4
Pediatrics*	340 (3.4)	349	-
TOTAL	9937 (100.00)	17702 (100.0)	

\*This department was not constantly active

**Table 2. Comparison of the pre and post intervention data of the most prevalent diagnoses in SSK patients**

Departments	Gate-keeping			No gate-keeping		
	ICD	Diagnosis	%	ICD	Diagnosis	%
Cardiology	I10.01	Essential hypertension	18.9	F41.9	Anxiety disorder, unspecified	20.0
Respiratory Medicine	J44.9	Chronic obstructive pulmonary disease, unspecified	26.9	M79.1	Myalgia	14.3
Orthopedics	Z09.4	Follow-up examination after treatment of fracture	10.2	M25.5	Pain in joint	41.6
Neurology	G40.9	Epilepsy, unspecified	31.5	R42	Dizziness and giddiness	35.8
Gynecology	N97.9	Female infertility, unspecified	22.9	N76.1	Subacute and chronic vaginitis	25.6
Urology	N40.01	Hyperplasia of prostate	22.6	N39.0	Urinary tract infection, site not specified	29.3
Physical Medicine and Rehabilitation	M51.0	Lumbar and other intervertebral disc disorders with myelopathy	22.9	M51.0	Lumbar and other intervertebral disc disorders with myelopathy	15.3
Pediatric surgery	K40.9	Unilateral or unspecified inguinal hernia, without obstruction or gangrene	10.7	R68.0	Other general symptoms and signs	11.9
General surgery	R10.4	Other and unspecified abdominal pain	11.7	R10.4	Other and unspecified abdominal pain	11.7
Cardiovascular surgery	I87.2	Venous insufficiency	32.0	I87.2	Venous insufficiency (chronic) (peripheral)	59.0

**Table 3. Comparison of outpatient payments according to specialties before and after elimination of Gate-Keeping in SSK**

Departments	Fix-payment per visit (TRL)	The most frequent diagnosis after the intervention	ICD code	Gate-keeping (17.5 months)		No Gate-keeping (5.5 months)	
				Number of patient (%)	Payment (TRL)	Number of patient (%)	Payment (TRL)
Cardiology	56	Anxiety disorder	F41.9	6 (2.2)	336	183 (20.0)	10248
Respiratory Medicine	49	Myalgia	M79.1	2 (0.9)	98	72 (14.3)	3528
Orthopedics	49	Pain in joint	M25.5	101 (8.4)	4949	1123 (41.6)	55027
Neurology	51	Dizziness and giddiness	R42	10 (1.9)	510	413 (35.8)	21063
Gynecology	61	Subacute and chronic vaginitis	N76.1	41 (4.5)	2501	447 (25.6)	27267
Urology	55	Urinary tract infection	N39.0	66 (13.0)	3630	261 (29.3)	14355
Pediatric surgery	49	Other general symptoms and signs	R68.0	7 (10.4)	343	12 (11.9)	588
	Total			229 (6.2)	12367	2511 (31.3)	132076

TRL: Turkish Liras

In the final evaluation for the seven departments of the university hospital, the payment of SII for each diagnosis was calculated using the fix-payment prices (Table 3). The calculated payments for each department in the two periods were added and compared. The total payment of SII in the first period was 12367 TRL and in the second period was 132076 TRL. The total payment of SII for the second period was

10.67 fold higher than the first period. These illnesses which were diagnosed during the second period in the university hospital, if they were diagnosed in a primary health care, the SII would have paid 27621 TRL only (SII fix price for per patient is 11 TRL). The total payment of SII for the second period in the University Hospital was 4.78 fold higher than in primary health care.

## Discussion

In the last few years, and as a result of the flexibility in the gate-keeping and discretionary referrals, there has been a decrease in controlling the outpatient specialist visits. In this study, we found an increase in the number of outpatient visits to the specialist clinics in a university hospital and a decrease in the control of this visits, after the cancellation of the gate keeping by some of the social security institutes. There was a statistically significant relation between the decrease in the control of referral and removal of the gate-keeping (Second intervention) in the SSK and Bag-kur. With the second intervention, there has been an increase in the visit rates to some of the departments for SSK patients. The highest visit rate was found in the departments of cardiology, cardiovascular surgery, respiratory disease and the orthopedics. In a study of a commercially insured population of adults, Timothy et al. (1) had found that the percentage of visits to primary care physicians and to specialists changed little after gate-keeping had been removed, and the increase in percentage of visits to specialists was due in part to relative decreases in the percentage of visits to obstetricians and gynecologists.

In our study, we found that the elimination of gate-keeping for patients registered with SSK have resulted in a relative increase in visits to specialists in the University Hospital for anxiety disorder, myalgia, joint pains, giddiness, subacute and chronic vaginitis and urinary tract infection. These symptoms or diseases can be diagnosed and treated easily in primary health care units. In their study, Timothy et al. (1) had found a relative increase in visits to specialists for low back pain and this may be an indication of the extent to which people in the United States seek alternative care for back pain. In one of the few comprehensive assessments of the effects of managed health plan controls on specialty referrals, Grembowski and colleagues found that, among patients with common pain problems, a specialty withhold was associated with lower likelihood of referral (13) and among patients with depressive symptoms, this finding held true for low-income patients (14). In our study, and in accordance with the results of Gremboski et al. (14) workers with low-income, members of the SSK and blue-collar public sector have anxiety disorders.

Another study in Switzerland has compared two local health plans, a gate-keeping and fee for service plan, offered by the same group of health insurance companies. The characteristics of gate-keeping and fee for service beneficiaries were largely similar. Unadjusted total costs per person were 8% lower in the gate-keeping group. After multivariate adjustment, the estimated cost savings achieved by replacing fee for service based health insurance with gate-keeping in the source population amounted to Sw fr 403-517 (15%-19%) per person (12). In our study, we found that the removal of the gate keeping programme in SII patients has resulted in an increase in cost spent for outpatient visits. Furthermore, we found that the tertiary care outputs were changed (15).

There has been a 10.67 fold increase in the health spent on the SII outpatients, after the removal of the gate-keeping, for the increased rate of visits and for the most frequently diagnosed diseases in the seven outpatient departments. Besides,

these diagnoses can be managed easily and less expensively in primary care, and has been in the first line in most departments of the tertiary care units. Incorporating nurses into primary health care may provide benefits such as cost savings (16). The integration model of community centres in Malaysia involving doctors, nurses and allied health professionals, such as physiotherapists, in a single location deserves further examination (16).

Particularly in patients with anxiety disorders, they had visited the cardiology clinics instead of visiting the psychiatry clinics. Probably, this had resulted in unnecessary prescriptions and unnecessary expenditures by the SII.

### Limitations of this Study

Several limitations of our study should also be considered. First, in our study we investigated the effects of removing the gate-keeping programme on the expenditure and fixed payment for outpatient visits but we did not perform the cost analysis. Second, detailed analysis involved the SSK only and not the other social security institutes. Third, the prescriptions were not evaluated. Fourth, there was no active pediatric outpatient clinic in the hospital in which this study was performed, so the change in the pediatric outpatient visits was not evaluated.

These limitations indicated that elimination of gate-keeping affects SII, especially costs, but revealed the necessity for research this issue.

## Conclusion

In conclusion, this study has shown that removal of the gate-keeping has resulted in an increased rate of visits to a tertiary care center (university hospital). Most of these visits can be unnecessary and less expensive in the primary care centers.

### Conflict of Interest

No conflict of interest was declared by the authors.

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