



INTERNATIONAL JOURNAL OF ECONOMIC STUDIES

ULUSLARARASI
EKONOMİK ARAŞTIRMALAR DERGİSİ

June 2017, Vol:3, Issue:2
e-ISSN: 2149-8377

Haziran 2017, Cilt:3, Sayı:2
p-ISSN: 2528-9942

journal homepage: www.ekonomikarastirmalar.org



Cost of Health Care and Utilization of Emergency Departments in Turkey

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ARTICLE INFO

Article History:

Received 17 May 2017
Received in revised form 12 June 2017
Accepted 14 June 2017

Keywords:

Free Emergency Department Visits,
Emergency Department Utilization,
Diseases and Accidents, Blinder-Oaxaca

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ABSTRACT

The purpose of this study is to understand the relationship between some diseases /accidents and emergency department visits. Turkey implemented a series of healthcare reforms aimed at providing healthcare services less expensive and easily accessible to citizens. I study the impact of providing free emergency care services to the patients in Turkey regardless of their insurance status on utilization of emergency departments at hospitals. Using a Blinder-Oaxaca method, I observe that coefficients explain more than 100 % of the difference and that patients regardless of health concern visit emergency departments. I also find that emergency care visits for all insurance types increased after the policy change in 2008 by about 5 %.

INTRODUCTION

Turkey has undergone many healthcare reforms since the beginning of the Health Transformation Program (HTP) which has started in 2003. These reforms aimed at increasing access to healthcare services, reducing the inequity among those who have different socio-economic backgrounds, and improving health outcomes.¹

One of the most significant reforms in Turkey was to provide free emergency department (ED) visits to everyone regardless of their insurance status. The policy shift was put into implementation on 26 June 2008. This indeed increased the average number of visits to emergency rooms in hospitals between the years of 2008 and 2010 for different insurance types such as SSK (social insurance for formal sector employees), Green Card holders (for the poor), uninsured people, and privately insured citizens.

Current literature on ED care covers various aspects such as overcrowding, ambulance diversion, poor quality of care, unnecessary patient death, and longer waiting times. Some studies in Turkey expose only either before the policy change period or after the change which states that emergency care is free regardless of insurance status, when they analyze the relationship between the emergency department visits and the reason for visit.²⁻⁴

The purpose of this study is to construct before and after analysis, considering the policy change regarding the ED visits in 2008. To the best of my knowledge, no other studies in Turkey have done such analysis via utilizing a Blinder-Oaxaca method through which I could employ mean comparisons of the outcome variable over the years. It is also important to note that this study utilizes nationally representative datasets which current literature in Turkey had also been missing in their analyses.

1. Theoretical Framework / Existing Studies

Turkey has introduced a major health system program, the HTP, which aimed at overcoming major inequities and providing access to necessary care. One important aspect of the HTP is to provide all citizens free ED visits regardless of their insurance status, which had not been offered patients in the past without being insured. This policy change is of great importance because the ED treatment performs procedures to instantly ease situations³ and is to treat seriously ill and injured patients.

However, reducing the cost of emergency care services might increase the utilization of emergency rooms by those who possess diagnosis which are not appropriate for emergency care, which then would lead to overcrowding and other undesirable results.

Overcrowding is an important issue at emergency care departments of hospitals. Visiting emergency departments for diagnosis which are not emergency appropriate would contribute to overcrowding⁵ and this action appears too costly.⁶

Overcrowding would lead to frequent ambulance diversion, which then threatens public health, poor quality of care, and even unnecessary patient deaths.^{7,8} Inappropriate utilization of the ED prevents real emergency cases to be accessed and reduce the acquisition of care and affect the quality of care.³ Moreover, an increase in the number of emergency visits could raise the length of waiting time for non-urgent visits.^{9,10}

It is also important to note that those who have lower income substitute emergency rooms for family practitioners¹¹ and those who wait for care in an emergency departments are mostly poor, uninsured, and young people and who have access barriers to other services.⁹

The emergency departments provide continuous availability of services such as diagnostic and therapeutic services, acute medical and surgical conditions¹², that would make them appeal to patients especially after physician hours, which would then lead to overcrowding and other sort of problems³.

2. Empirical Analysis

2.1. Data

The Turkey Health Surveys 2008, 2010, and 2012 provide information on various types of diseases such as arthritis, back pain, hypertension, asthma, heart failure, stroke, infarcts and many more and self-reports on the use of healthcare services by members of the households for individuals 15 years and older. The survey samples all settlements in the territory of the Republic of Turkey. Institutional populations (soldiers, individuals living in dormitories, prisons, hospitals at the long terms, homes for the elderly, etc.) and small villages with population less than 132 persons are excluded from the survey. The survey is representative of the country.

The Health Surveys 2008, 2010, and 2012 derive many indicators on health including health conditions of adults and the utilization of healthcare services such as utilization of emergency departments, outpatient care services, and inpatient care in the last 12 months, and satisfaction levels from these services, difficulties faced during daily activities and cigarette and alcohol using habits for individuals 15 years old and over.

2.2. Methodology

The decomposition technique discovered by Blinder¹³ and Oaxaca¹⁴ is used to investigate the mean outcome differences between groups.

Suppose there are two groups, a and b; and a dependent variable, Y; and a vector of predictors. The idea is to figure out how much of the mean outcome difference between the groups, a and b:

$$R = E(Y_a - Y_b) \quad (1)$$

where E(Y) indicates the expected value of the dependent variable.

The Blinder-Oaxaca estimates are based on the linear model:

$$Y_l = X'_l \beta_l + e_l, \quad E(e_l) = 0 \quad l \in (a, b) \quad (2)$$

where X is a set of predictors and a constant, β includes the slope parameters and the intercept, and e is the error term. Therefore, the mean outcome difference can be found as the difference in the linear prediction at the group-specific means of the regressors:

$$R = E(Y_a) - E(Y_b) = E(X_a)' \beta_a - E(X_b)' \beta_b \quad (3)$$

where $E(\beta_l) = \beta_l$ and $E(e_l) = 0$ by assumption.¹⁵

The methodology to illustrate the outcomes (utilization of ED) by groups (by years) is to decompose mean differences in outcomes by Oaxaca decomposition method based on linear regression models. Oaxaca explains mean differences in outcomes by three components which are endowments (explained by group differences in predictors), coefficients (unexplained by group differences), and interaction terms.

To find the contribution of group differences in observables, (3) will be reorganized as follows (see Winsborough and Dickinson¹⁶; Jones and Kelley¹⁷; and Daymont and Andrisani¹⁸):

$$R = \{E(X_a - X_b)\}' \beta_b + E(X_b)' (\beta_a - \beta_b) + \{E(X_a - X_b)\}' (\beta_a - \beta_b) \quad (4)$$

This is called a threefold decomposition in which the outcome difference is divided into three parts:

$$R = E + C + I \quad (5)$$

The first component, E accounts for the differences between groups, A and B in the predictors, that is called the endowments effect. The second component, C stands for the differences in the coefficients including the intercept. The last component, I, represents an interaction term which explains that the differences in endowments and coefficients occur at the same time between the two groups.¹⁵

The purpose of doing Oaxaca decomposition is to unfold the outcome variable which in our case is the ED visits in the last 12 months by a set of diseases and accidents. I want to know which diseases and accidents are explaining factors in visiting the ED.

I exploit Blinder-Oaxaca method to decompose the effect of this policy change which took place in June 26, 2008 in Turkey. I utilize the datasets implemented by the Turkish Statistical Institute (TurkStat) in 2008 and 2010; before and after the policy change. Through this method, I can do the mean comparisons before and after the change and can identify the percent change that occurred after 2008 with respect to endowments and coefficients of the surveyed people.

In this study, I report Blinder-Oaxaca decomposition estimates of the effect of offering a free healthcare service on utilization of emergency department rooms. The urgency of a complaint was determined according to a set of rules which is defined by the Turkish Ministry of Health. I first determine two categories which are named as emergency appropriate for diagnosis and emergency discouraged for diagnosis¹. In addition, there have some diseases and accidents in the survey, which may fall into either appropriate or discouraged categories, which I call in-between diseases². Therefore, I do the mean comparison analysis in outcomes by adding these in-between diseases in each category separately as well.

I utilize different types of diseases taken from the survey (whether the person experience the disease in the last 12 months) to construct these two categories. Then, I implement Blinder-Oaxaca decomposition to explain differences in these two designated groups (emergency appropriate and emergency discouraged) by years specified as 2008 and 2010.

2.3. Results

Model 1 and Model 2 in Table 1 do not display any differential impacts of in-between diseases when I put them in each model separately such that the mean outcome difference of emergency care visits report very similar results in both models. Therefore, from this point onwards, I will focus on the results by Model 1.

In this study, the group variable is time which stands for 2008-before the policy change and 2010-after the change. Our analyses show that there is an increase in the use of emergency rooms in hospitals after the policy change between 2008 and 2010 by 4.80 percent for all sample irrespective of insurance status. In the regression analysis, I control for some diseases and accidents through which I can explain whether there is a relationship between the visit and the experienced disease (or accidents) and can specify whether the visit was necessary. The necessity of visits is classified into two groups which are emergency department appropriate for diagnosis and emergency department discouraged for diagnosis as defined above.

When broken into components, Blinder-Oaxaca results indicate that most of the difference (more than 100%) could be explained by coefficients (5.80 %) and the constant term illustrates 3.40 % of the impact of coefficients, which means that everybody regardless of health concerns is visiting emergency department of hospitals no matter what.

¹ Emergency discouraged categories: arthritis, backache, neck pain, allergy, ulcer, migraine, urinary, anxiety, depression, anemia, mental problems, sinus, school accidents, and home accidents.

Emergency appropriate categories: heart failure, liver cirrhosis, cancer, continuous injury, car accidents, job accidents, infarcts, and stroke.

² In-between categories: hypertension, heart disease, bronchitis, asthma, and diabetes.

Table 1: Blinder-Oaxaca Decomposition Estimates

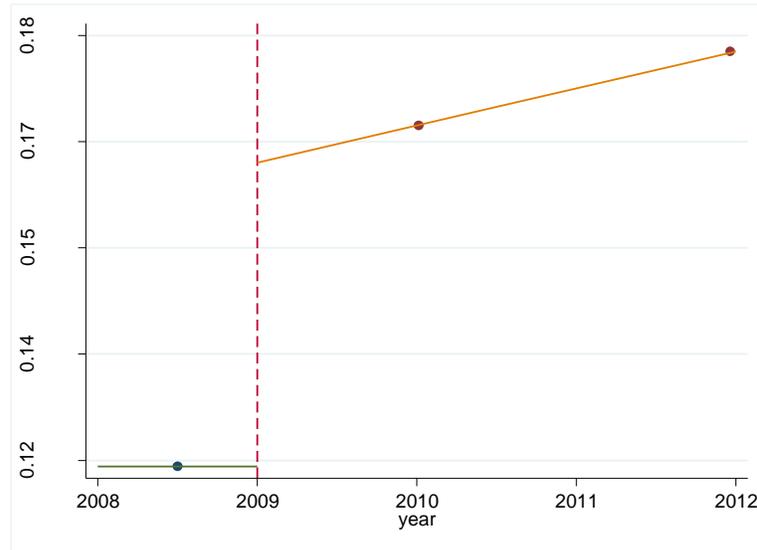
	Model 1	Model 2
	Coefficient / se	Coefficient / se
Overall		
Group 1 (2010)	0.167***	0.167***
	(0.003)	(0.003)
Group 2 (2008)	0.119***	0.119***
	(0.003)	(0.003)
Mean difference	0.048***	0.048***
	(0.004)	(0.004)
endowments	-0.007***	-0.006***
	(0.001)	(0.001)
coefficients	0.058***	0.056***
	(0.004)	(0.004)
interaction	-0.003***	-0.002***
	(0.001)	(0.000)
<i>Endowments</i>		
er discouraged	-0.005***	-0.004***
	(0.001)	(0.001)
er appropriate	-0.001*	-0.002***
	(0.001)	(0.000)
<i>Coefficients</i>		
er discouraged	0.025***	0.023***
	(0.004)	(0.005)
er appropriate	-0.001	-0.000
	(0.003)	(0.001)
Constant	0.034***	0.033***
	(0.006)	(0.006)
<i>Interaction</i>		
er discouraged	-0.003***	-0.002***
	(0.001)	(0.000)
er appropriate	0.000	0.000
	(0.000)	(0.000)

* p<0.05, ** p<0.01, *** p<0.001. ED discouraged for diagnosis in Model 1 does not include in-between diseases. ED discouraged in Model 2 does cover in-between diseases or accidents. Turkey Health Surveys 2008 and 2010 are used in the regression analysis.

Table 1 also shows that when endowments are broken down to “er discouraged” and “er appropriate”, fewer people with emergency department appropriate and emergency department discouraged for diagnosis visit the ED, which indicates that people are getting healthier. However, those who satisfy the necessary condition for emergency discouraged for diagnosis visit emergency care a lot more indicating 2.50 % increase in their visits.

I also notice that emergency department visits increased from 2008 to 2010 on average for everyone regardless of insurance status after the policy change. Figure 1 illustrates the increase in emergency care visits, which raised to 17 % from about 12 %.

Figure 1: Mean of Emergency Department Visits for All Patients

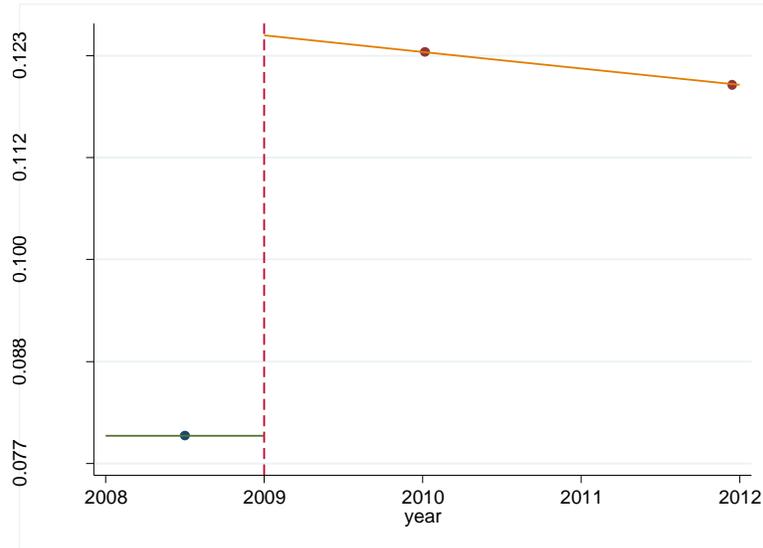


Authors' analysis, using data from Turkish Statistical Institute (TurkStat) Turkey 2008, 2010, 2012 Health Survey.

Data Source: Turkey Health Surveys Data from TurkStat are available by request.

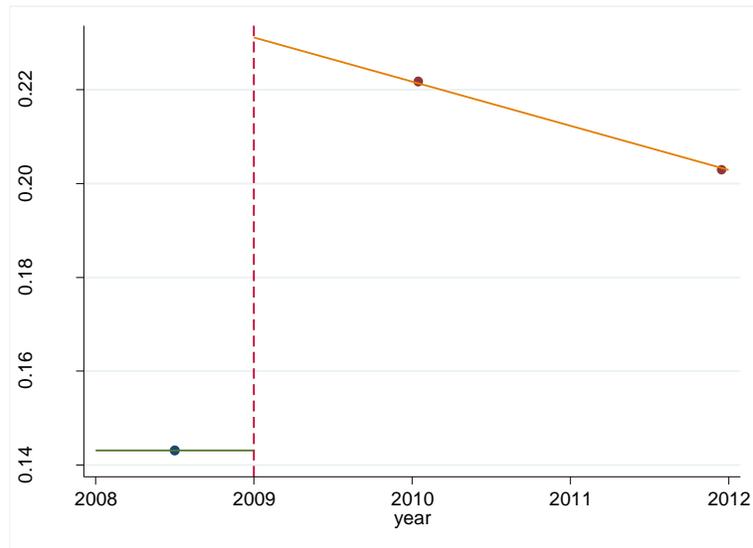
The distributional impacts of the policy change among those who have different types of insurance schemes such as SSK (formal sector employees), Green Card (the poor), non-insured, and privately insured people are worth to mention in this analysis.

Figure 2 and 3 illustrate the average emergency visits over the years (2008, 2010, and 2012) for uninsured citizens and Green Card holders, respectively. There were immediate jumps in the utilization of emergency care departments for these two groups right after the policy change. However, this change does not show a stable pattern (constant or increasing) for the year-2012 for both groups. The decline in utilization for both groups (felt more by Green Card holders) might be attributed to another policy change which took place on 27 January 2012. According to that change, patients must pay co-payment whatever insurance status they may have for emergency care discouraged diagnosis. The 2012 Health Survey covers three months' period after the change so the study was unable to encompass the full effect of this policy.

Figure 2: Mean of Emergency Department Visits for Uninsured

Authors' analysis, using data from Turkish Statistical Institute (TurkStat) Turkey 2008, 2010, 2012 Health Survey.

Data Source: Turkey Health Surveys Data from TurkStat are available by request.

Figure 3: Mean of Emergency Department Visits for Green Card Holders

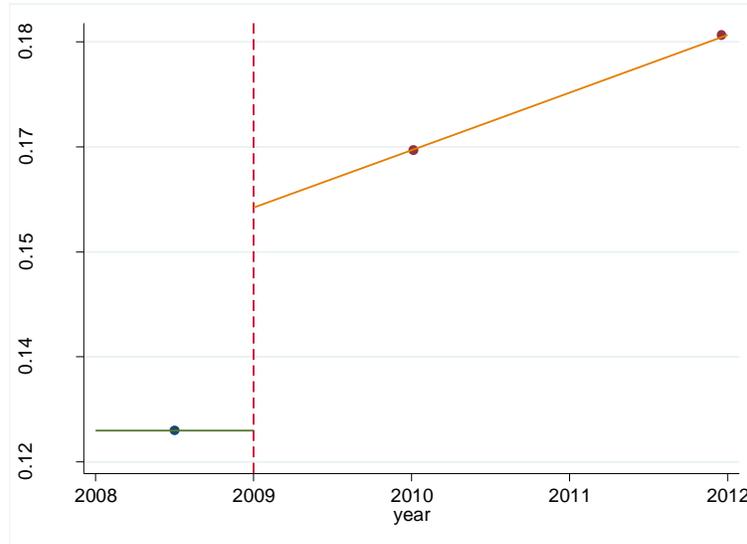
Authors' analysis, using data from Turkish Statistical Institute (TurkStat) Turkey 2008, 2010, 2012 Health Survey.

Data Source: Turkey Health Surveys Data from TurkStat are available by request.

Another important result in this study is that for SSK members and privately insured, I do not observe any reduction in the utilization of emergency care services (see Figures 4 and 5). This states that people with different socio-economic background were affected differently by the change in the law which implements a co-payment rule if the visit is not appropriate. It appears that those with higher income can ignore the

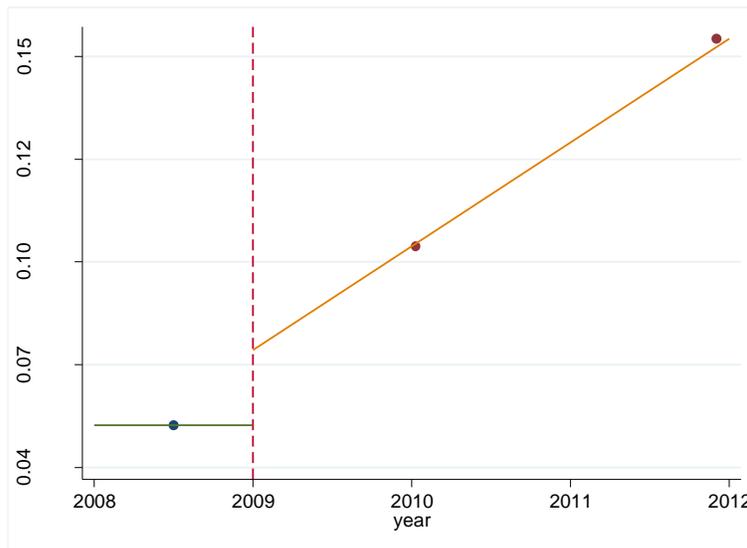
policy change and they could get treatment by paying out of pocket even if the diagnosis was not appropriate for emergency.

Figure 4: Mean of Emergency Department Visits for SSK Members



Authors' analysis, using data from Turkish Statistical Institute (TurkStat) Turkey 2008, 2010, 2012 Health Survey.
Data Source: Turkey Health Surveys Data from TurkStat are available by request.

Figure 5: Mean of Emergency Department Visits for Privately Insured



Authors' analysis, using data from Turkish Statistical Institute (TurkStat) Turkey 2008, 2010, 2012 Health Survey.
Data Source: Turkey Health Surveys Data from TurkStat are available by request.

CONCLUSION

In this study, I assess the impact of free ED visits to the general population in Turkey on the ED utilization with respect to the mean outcome differences. I find that more people are visiting emergency care departments right after the policy change in 2008. However, this stops at some point in 2012 for some groups with requiring non-urgent patients to pay a fee for their visits to the emergency departments. It is apparent that these groups are mostly the most vulnerable groups that might have some financial problems.

Our results indicate that offering free emergency care to everyone will increase the number of non-urgent cases to visit the ED at hospitals. This, in turn, will increase costs to the healthcare system¹⁹ and endangering the quality of emergency treatment when emergency departments get overcrowded (Rowe et al. 2006; Ding et al. 2006).^{20, 21}

Further research needs to be done with respect to considering utilization of other healthcare services. For example, looking at utilization of primary care and outpatient care delivery at hospitals, one could see what type of relationship exists between emergency care and these health services on whether they are substitutes or complements.

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