



# Numbers of Brain Deaths and Deceased Donors in Hospitals in Istanbul Region That Have Transplantation Units: A Retrospective Analysis Between the Years 2005 and 2015

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## ABSTRACT

**Background.** Turkey is one of the countries facing a serious organ shortage problem, with thousands of patients with end-stage organ failure. The Social Security Institution started to increase the reimbursement for transplantation operations in 2007 to solve this problem, and this policy has continued since then. Although the number of transplantation centers and operations in Turkey increased in this term, according to organ donation and transplantation statistics from the Ministry of Health, the rate of organ retrieval from deceased organ donors has decreased.

**Methods.** This study was performed with the purpose of retrospectively analyzing (between the years 2005 and 2015) the number of brain deaths and donors after brain death in hospitals that are affiliated with the Istanbul Regional Coordination Office and have transplantation units. Data were collected via the website of the Ministry of Health. Hospitals were categorized as those directly affiliated with the Ministry of Health, university hospitals, and private hospitals.

**Results.** This study found that the number of transplantation centers has increased >3 times since 2005, and the number of private transplantation centers has increased 9 times for the same period. We also found that the number of brain deaths, donors after brain death in hospitals, and number of brain deaths and donors after brain death per hospital had varied throughout the study years.

**Conclusions.** Although the number of transplantation centers has increased since 2005, the number of brain deaths and donors after brain death has not increased to the same extent for this period in these hospitals that have transplantation units.

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**I**T is known that today, although countries have the economic, technical, pharmaceutical, and workforce resources, and of course willing patients (recipients), to perform organ transplantations, they cannot do so because of a shortage of organs [1,2]. The gap between the number of organs required and those obtained is a serious issue for organ transplantation professionals. Thousands of new patients worldwide are being added to waiting lists for transplantation every year, while those who have already been waiting cannot find any organs or die [3–5]. The deceased donor problem is more serious and unfortunately is still the most important issue for Turkey [6,7].

To solve the organ shortage problem of Turkey, the National Coordination System (NCS) was established by the Ministry of Health according to an NCS regulation that was renewed in 2008. Nine regional coordination offices were established [8]. Parallel to this formation, the Organ and

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**Table 1. Number of Brain Deaths and Number of Brain Deaths Per Hospital**

Variable	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>No. of brain deaths</b>											
University	18	2	8	11	24	12	53	54	55	55	57
MoH	2	4	19	19	21	36	37	49	46	69	52
Private	10	8	28	19	37	23	24	18	26	29	35
Total	30	14	55	49	82	71	114	121	127	153	144
<b>No. of brain deaths per hospital</b>											
University	4.5	0.5	2.0	3.6	8.0	2.4	8.8	9.0	9.2	9.2	9.5
MoH	3.3	2.6	9.3	7.5	6.2	3.8	3.4	2.6	3.7	9.9	6.5
Private	1.0	1.3	2.7	2.4	3.0	2.3	2.1	2.7	2.5	1.7	1.9
Total	3.3	1.4	3.9	3.3	5.1	2.6	3.7	3.9	4.1	5.3	4.5

Abbreviation: MoH, Ministry of Health.

Tissue Transplantation Services Directive was published [9]. According to this directive, it became mandatory for transplant centers to sign a contract with the Social Security Institution (SSI) for retrieval of organs of deceased donors from the National Coordination System. SSI increased the reimbursement for transplantation operations in 2007, and this policy has continued since then. Transplantation centers affiliated with public or private hospitals were prohibited from receiving additional payments for transplantation from patients [9,10]. These steps resulted in a huge increase in the number of transplantation centers (from 62 centers in 2005 to 140 in 2015), as well as an increase in transplantation operations (from 926 kidney transplant operations in 2005 to 3204 in 2015). There were 9 transplantation centers in the Istanbul region in 2005 (university, 4; Ministry of Health, 3; and private, 2), and it has increased to 32 (university, 6; Ministry of Health, 8; and private, 18) in 2015. However, transplantation numbers from deceased donors did not increase as much as had been expected [5,10,11].

The objective of the present descriptive study was to analyze retrospectively (between the years 2005 and 2015) the number of brain deaths and deceased donors (donors after brain death) in hospitals that are affiliated with the Istanbul Regional Coordination Office and have transplantation units.

**MATERIALS AND METHODS**

This retrospective descriptive study was conducted of hospitals that have at least 1 transplantation unit in the Istanbul Regional Coordination Office. The study used data from the website of Organ and Tissue Transplantation and Dialysis Services Office that is affiliated to the Ministry of Health, which had published all data related to transplantation centers, transplantation operations, brain deaths, and deceased or living donors from 9 regional coordination offices according to year. Hospitals were categorized as hospitals directly affiliated with the Ministry of Health, university hospitals, and private hospitals. We evaluated the data of the previous year at the beginning of the new year between the years 2006 and 2016 and calculated the number of brain death cases and donors per hospital according to hospital categories for each year.

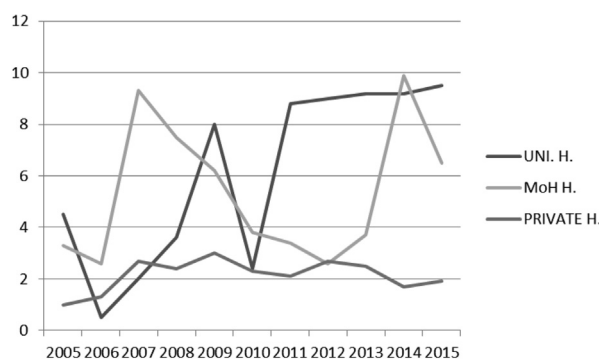
**RESULTS**

Results of this study are presented in 2 groups. First, the number of brain deaths in hospitals with transplantation

units was evaluated and then the number of diagnosed and reported brain deaths per hospital was calculated (Table 1). The number of brain deaths (30 in 2005) in hospitals increased nearly 5 times during the study time frame and reached 144 in 2015. Most of the brain death cases were reported from university hospitals in 2005, 2011, 2012, 2013, and 2015; from the Ministry of Health hospitals in 2010 and 2014; and from private hospitals in 2006, 2007, 2008, and 2009. Only the number of brain death cases that was reported from university hospitals gradually increased over the years except for 2005. The same number had fluctuated for the Ministry of Health and private hospitals.

The number of brain deaths per hospital was also calculated for each year and for each kind of hospital (Table 1). According to these findings, it was determined that the number of brain death cases reported from university hospitals was nearly 2 times higher than the other types of hospitals after the year 2010. The number of brain death cases per hospital was the lowest for private hospitals except from 2006 and 2007 (Figure 1).

The number of donors, which was 18 in 2005, has increased nearly 3 times over the years and reached 52 in 2015. Most of the donors were reported from university hospitals in 2005, 2009, 2010, and 2011 and from Ministry of Health hospitals in 2006, 2007, 2008, 2010, 2012, 2013, 2014,



**Fig 1.** Number of brain deaths per hospital (H) from 2005 to 2015. Abbreviations: MoH, Ministry of Health; UNI H., university hospital.

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