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## **COST OF CAESAREAN SECTION RATES IN TURKEY AND THEIR BURDEN IN THE TURKISH HEALTH ECONOMICS**

### **Abstract:**

Caesarean section is generally recommended when it is not possible to confidently complete the vaginal birth or there is a certain risk of increase in the morbidity and mortality rates of mother and/or infant due to vaginal birth. Even though caesarean section is recommended only under certain conditions, the rate of caesarean sections has shown a significant tendency of increase in recent years in Turkey. The increase of caesarean sections, which are more costly compared to normal births, causes an unnecessary cost for the national economy. The objective of this study is to give information about the rates of caesarean sections in Turkey, make assumptions about the approximate costs of normal births and caesarean sections and their postpartum outcomes in our country, and propose solutions for decreasing the rates of caesarean sections and thus, the economic burden it causes in our country.

### **Keywords:**

Caesarean section, cost, Turkey

**JEL Classification:** I19

## Introduction

Birth by caesarean section is one of the most frequently performed surgical attempts in recent years both around the world and in Turkey (Kiran and Jayawickrama 2002; Hopkins and Amaral 2006). Caesarean section is an operation in which fetus weighing 500 gr. or more are delivered through front abdominal wall and uterus laceration (Güney et al., 2006; Amirikia et al., 1981). Generally, caesarean section is implemented in case it is not possible to safely complete a vaginal birth or if there is an apparent risk of increase in maternal and/or fetal morbidity or in mortality along with the vaginal birth (Republic of Turkey Ministry of Health, 2010).

Caesarean section, in early stage, brings about the risk of many complications such as: risks of anaesthesia, loss of blood, bladder and intestinal injuries, injury of the baby; infection and bleeding in post-operation period, respiratory tract problems in newborn infants; placenta problems, womb injuries, recurrent caesarean section risks in the later pregnancy period; infertility, intestinal obstruction, chronic pelvic ache in future periods (Dölen and Özdeğirmenci, 2004). There are still no strong proofs regarding the relative risks and benefits of caesarean section birth carried out due to non-medical reasons. Nevertheless, the evidences indicate that the normal vaginal birth is safer both in the short and long run in terms of the mother and the baby. Surgical interventions made on the uterus have negative effects on the future pregnancy and births (Turkish Society of Obstetrics and Gynecology, 2013).

Increases are observed in caesarean section rates in almost all OECD countries. The most important reasons of this increase are the increase in birth age, increase in multiple pregnancies as a result of false reproduction techniques, convenience of appointment both for the mother and the physician, and the fact that some women prefer having an optional caesarean section birth (OECD, 2015-14). In addition to these factors, the use of electronic fetal monitor becoming widespread, socio-economic factors, concerns of the physicians on malpractice, and the increase in the number of the women with uterus scars caused by previous caesarean section (Geidam et al., 2009; Nino, 2011), painless birth by epidural anaesthesia not being too widespread, considering the normal birth as a waste of time, the changes in the education of midwife and doctors, provision of inadequate information and support in pre-birth care, fear of vaginal birth and false beliefs in vaginal birth (Duman et al., 2007; Büyükbayrak et al., 2010; Yaşar et al., 2007) are the factors causing an increase in the caesarean section rates. Although it is failed to reach concrete results of the detailed cost research for caesarean section operation in our country, when it is compared to vaginal births in western countries like the USA, medical measures have been taken recently to decrease the rates of caesarean section and started to be implemented, as it brings about quite high costs (Geidam et al., 2009; Nino, 2011). Moreover, the mother mortality rates that increase in caesarean section births, baby and mother diseases, and the increasing post-birth complications caused an increase in the questions regarding the suitability of caesarean section births which are not required medically. The law-making processes regarding caesarean section were

finalized and the optional caesarean section was banned as a precaution to the caesarean section rates increasing in our country (Çakmak et al., 2014). The increase in Turkey's rate of caesarean section has become a significant health problem due to the fact that it causes a cost increase, when compared to the increasing risks in terms of mother and baby health and to normal birth (Geidam et al., 2009).

## 2. Caesarean section Birth Rates in Turkey

In table 1, the rates of births and caesarean section births that occur in health institutions in Turkey are provided as a share within all births. Accordingly, while the rate of births that occurred in 2002 in health institutions was 75%, this rate increased to 98% in 2014. The rates of caesarean section in all births, however, reached the level of 51.1% with a great increase in 2014, while they were 21.0% in 2002.

**Table 1: Caserean Sections Among All Births by Years, Turkey**

	2002	2010	2011	2012	2013	2014
<b>Births in Health Care Institution (%)</b>	75	92	94	97	98	98
<b>Casarean Sections Among All Births (%)</b>	21.0	45.5	46.6	48.0	50.4	51.1
<b>Primary Casarean Sections Among All Births (%)</b>	-	25.7	24.8	24.6	25.9	26.3

Source: Republic of Turkey Ministry of Health, Health Statistics Yearbook 2014

The caesarean section birth rates by years and sectors are provided in Table 2. Accordingly, while the rate of births that occurred in 2002 in the Ministry of Health was 40.2%, this rate decreased to 35.5% in 2014. The rate of caesarean section in private hospitals, however, increased from 63.7% to 69.5% in 2014. As it can be seen from the table, the rates of caesarean section in university hospitals and private hospitals are higher than those in the hospitals of the Ministry of Health.

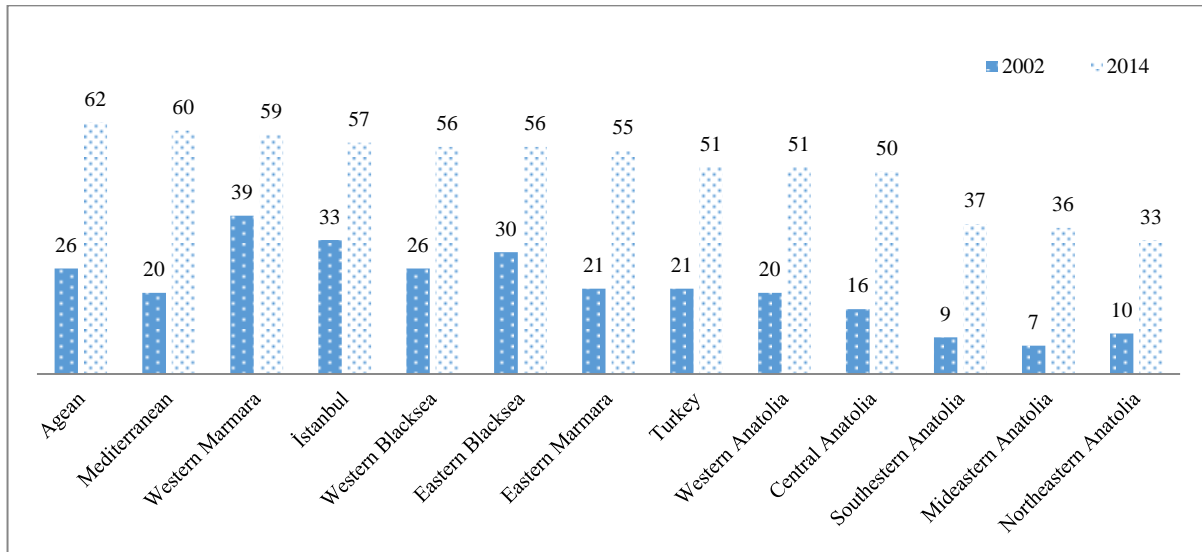
**Table 2: Casarean Sections Among All Hospital Births by Years and Sectors, (%), Turkey**

	2010	2011	2012	2013	2014
<b>Ministry of Health</b>	40.2	36.8	35.3	36.0	35.5
<b>University</b>	65.2	65.9	62.6	63.0	63.8
<b>Private</b>	63.7	66.6	66.2	67.9	69.5
<b>Total</b>	<b>49.7</b>	<b>49.7</b>	<b>49.6</b>	<b>51.4</b>	<b>52.4</b>

Source: Republic of Turkey Ministry of Health, Health Statistics Yearbook 2014

In figure 1, the rates of caesarean section births, which occurred in 2002 and 2014 by regions in Turkey, in all births are provided. As it can be seen from the figure, the highest rate of birth occurred in Aegean Region by 62%, while the lowest rate occurred in Northeastern Anatolia Region by 33%.

**Figure 1: Proportion of Cesarean Sections Among All Births by Regions in Turkey (%), 2002-2014**

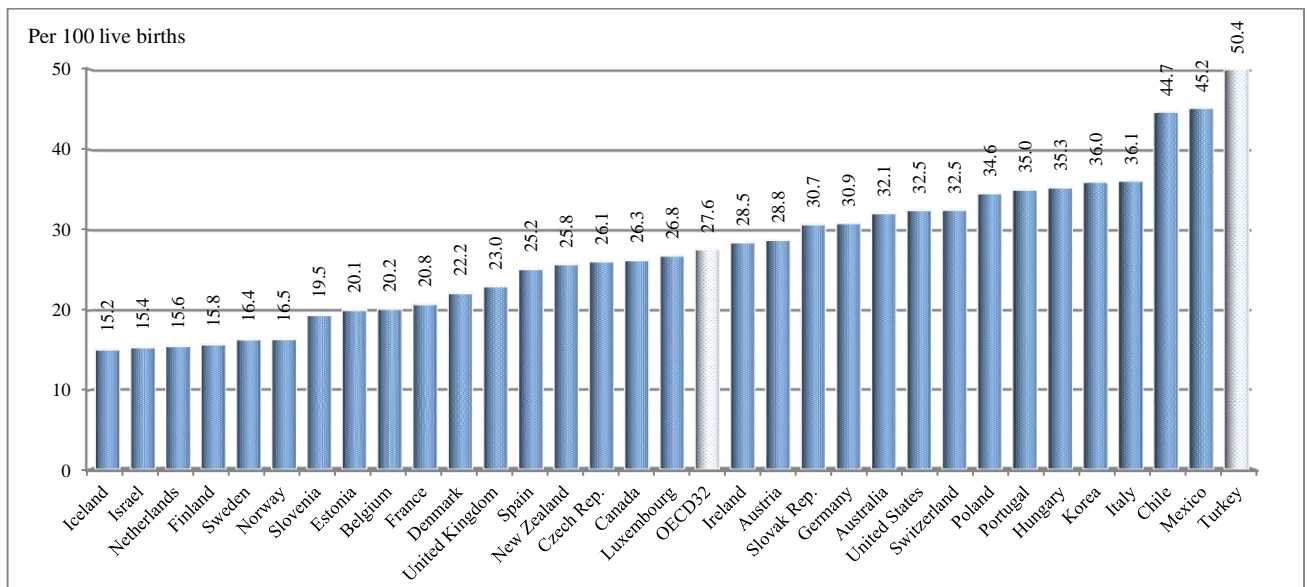


Source: Republic of Turkey Ministry of Health, Health Statistics Yearbook 2014

### 3. Turkey’s Place among World Countries in Caesarean Section Rates

In Figure 2, the rates of caesarean section births that occurred in OECD countries in 2013 are shown. As per this figure, while Turkey is the country with the highest caesarean section birth rate by %50.4, the country with the lowest rate is Iceland by 15.2%. The OECD average is 27.6%.

**Figure 2: Caesarean section rates, 2013 (or nearest year)**

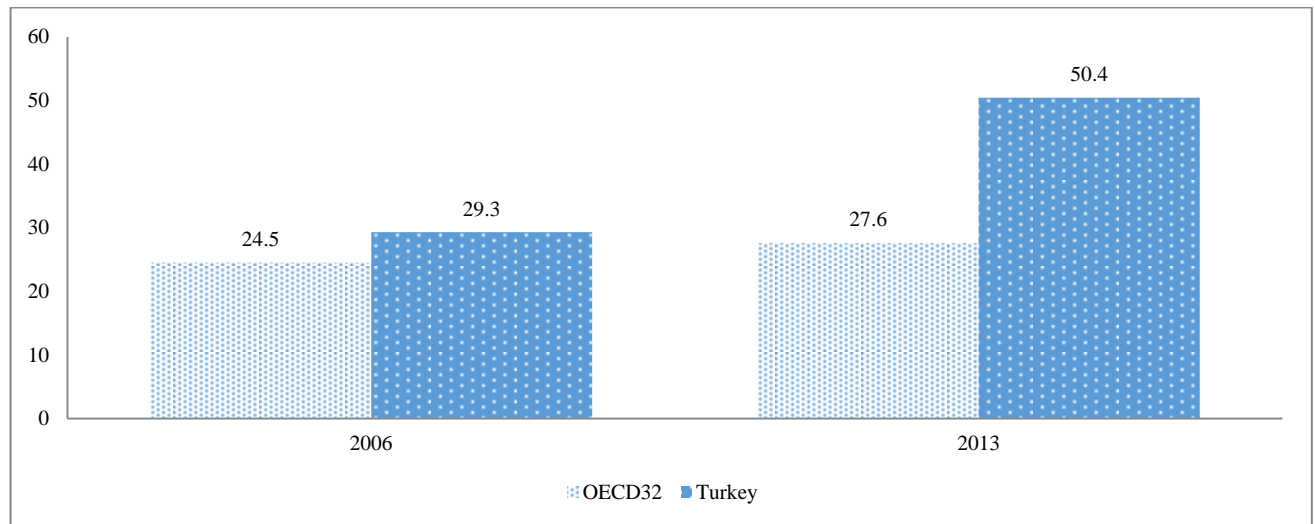


Source: OECD Health Statistics 2015, <http://dx.doi.org/10.1787/health-data-en>.

The graphic of change of caesarean section birth rates that occurred in Turkey and OECD countries in 2006 and 2013 is provided below. Accordingly, while the rate of caesarean section is 29.3% in Turkey in 2006, it is 24.5% in OECD countries. This

differential expanded in 2013, and the rate of caesarean section in Turkey was 50.4 (Figure 3).

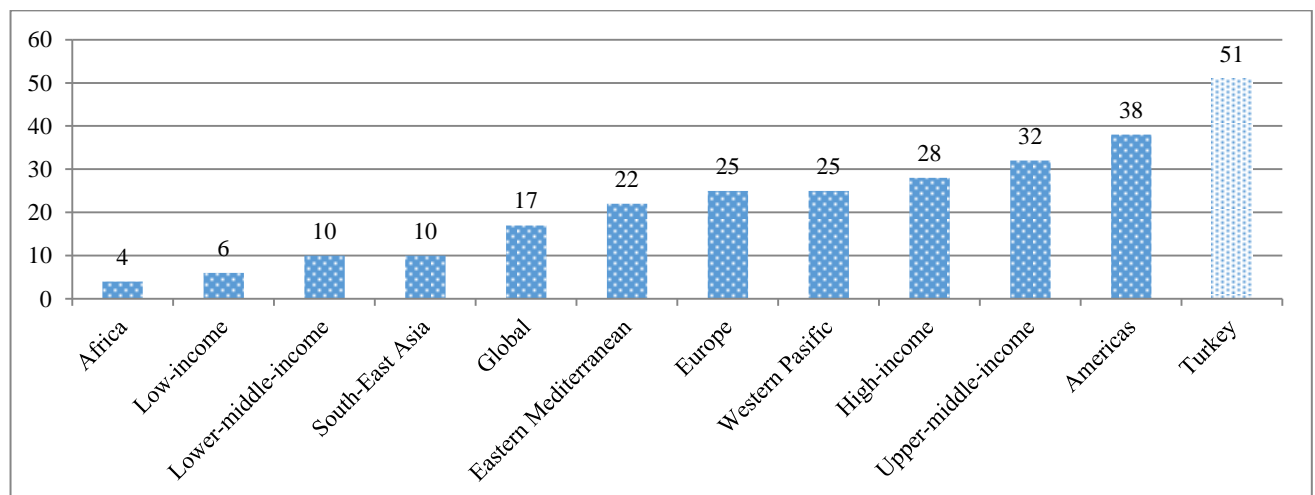
**Figure 3: Changes in caesarean section rates, 2006 to 2013**



Source: OECD Health Statistics 2015, <http://dx.doi.org/10.1787/health-data-en>.

In Figure 4, international comparison of the caesarean section birth rates in 2014 is provided. Accordingly, while the caesarean section rate in the whole world is 17, it is 25 in the European region, and 4 in the African region. When considered in terms of income groups, this rate is 32 in countries with intermediate income, while 6 in countries with low income. Turkey, however, is on the highest levels in this comparison.

**Figure 4: International Comparison of Cesarean Sections Among All Births, (%), 2014**



Source: WHO Statistics 2015 <http://apps.who.int/gho/data/view.main.1610?lang=en>

#### 4. Costs of Birth in Turkey

The fees of birth in Turkey are regulated in Health Application Communiqué ANNEX-2/C published by Social Security Institution (SSI), the organization in charge of repayment. Subparagraph 16 of article 2.2 titled "Methods of provision of health services funded, and the rules of payment" included in the Health Application

Communiqué states as follows: "The coefficient is determined for the transactions included in ANNEX-2/C list by the scores subject to payment, the price of transaction is the amount to be found by the multiplication of the related score by the coefficient." Furthermore, the rate of VAT implemented on health services in Turkey is 8%. A calculation based on this fact is made in the following table. In addition, all private hospitals may get a maximum 200% additional price. Accordingly, while the amount of payment made by the SSI in Turkey for normal vaginal birth is 432,00 TL, the payment made for caesarean section births is 486,00 TL. Furthermore, due to the fact that caesarean section is a risky group, the duration of stay in hospital gets prolonged, the numbers of examination and analysis increase, and the treatments they receive may differ from the standard treatments. In training - research hospitals, however, when students attending, consumables, wearing fees of fixtures, complications based on the processes carried out, and their treatments are combined, the cost of patient in quality hospitals go way beyond the amount stipulated (Ertekin et al., 2009).

**Table 3. Costs of Birth**

	Operation Score	SSI Payment	Can be Taken Maximum Extra Charge (%) (VAT included) TL
Normal vaginal birth	674,54	$(674,54 \times 0,593) + \text{VAT} = 432,00 \text{ TL}$	864,00
Normal vaginal birth (first birth)	843,17	$(843,17 \times 0,593) + \text{VAT} = 539,98 \text{ TL}$	1.079,96
Normal vaginal birth (multiple pregnancy)	843,17	$(843,17 \times 0,593) + \text{VAT} = 539,98 \text{ TL}$	1.079,96
Cesarean section	758,85	$(758,85 \times 0,593) + \text{VAT} = \mathbf{486,00 \text{ TL}}$	972,00
Cesarean section (multiple pregnancy)	876,00	$(876,00 \times 0,593) + \text{VAT} = 561,01 \text{ TL}$	1.122,02

Source: SSI (2016), [http://www.sgk.gov.tr/wps/portal/tr/mevzuat/yururlukteki\\_mevzuat/tebligler](http://www.sgk.gov.tr/wps/portal/tr/mevzuat/yururlukteki_mevzuat/tebligler)

In Table 4, the payments made by the SSI are calculated by the normal birth and caesarean section + primer caesarean section birth numbers obtained from Turkish Public Hospitals Institution. The calculation carried out in the table does not consider the differences such as first birth or multiple pregnancy, and additional prices received private hospitals, only the minimum difference of cost that may occur approximately was calculated. Accordingly, normal vaginal births are more in the hospitals of the Ministry of Health than other sectors, while caesarean section + primer caesarean section births are more in private hospitals than other sectors; therefore the costs are higher. As it can be seen from the table, approximately 73.065,240 TL difference occurred in two birth types. In the study of Özmen et al. in 2012 through which they examine the simple cost-effectiveness analysis in type of birth and complications in fetal macrosomia (baby bigger than normal), the fact that it is found that the total cost per patient in caesarean section operation is nearly more than twice the vaginal birth (937 TL/patient and 491 TL/patient) supports or findings.

**Table 4. Number of Births and Total Birth Costs by Sectors in Turkey**

	Normal Vaginal Birth			Cesarean section + Primer Cesarean section			Total Cost Difference Between Two Birth Types
	*Number of Births	SSI Payment	Total Cost	* Number of Births	SSI Payment	Total Cost	
<b>Ministry of Health</b>	431.366	432,00 TL	186.350,112	258.900	486,00 TL	125.825,4	<b>73.065,24 TL</b>
<b>University</b>	21.192		9.154,944	47.105		22.893,03	
<b>Private</b>	159.244		68.793,408	388.159		188.645,274	
<b>Total</b>	611.802		264.298,464	694.164		337.363,704	

\*Source: Public Hospitals Administration of Turkey (2014) <http://rapor.saglik.gov.tr/istatistik/rapor/index.php>

## 5. Discussion

As a result, considering the fast increase in caesarean section rates causing a serious economic financial burden on Turkey, the health policy and services regarding this issue must be reviewed. When compared to vaginal births, considering the complications occurring in the mother and the baby during the caesarean section operation and the problems that may occur in future births, it is required not to carry out births which are not medically necessary, and the healthcare personnel must not encourage the parents.

Furthermore, as stated in Table 1, the primer caesarean section rates among all births are quite high too (2014: 26.3%). The fact that the mothers having primer caesarean section are highly required to perform caesarean section in the future births, and the limitation of the number of births to be carried out must be taken into consideration, and this case must be evaluated for the good of the patient particularly in risky pregnancies.

Necessary measures in terms of healthcare workers must be taken against the discouraging from carrying out vaginal birth due to reasons such as the fact that the vaginal birth is considered a waste of time by the healthcare officials, physicians' concerns about malpractice, provision of inadequate information and support in pre-birth period, and the fact that C-section operation provides a convenience of appointment both for the mother and the physician. It is important that the physicians and particularly midwife encourage vaginal birth, have a good tracking and communication with the parents, and eliminate the pre-birth concerns by encouraging.

As a summary, in line with the decrement of caesarean section rates in our country, it is suggested that measures be taken to encourage normal birth, to make the use of analgesia widespread, to implement protocols and algorithms of the Ministry of Health, to popularize the educational courses on the preparation to parenthood and for the related health personnel, to determine the preferences of birth of the women and their reasons, and the problems they face regarding the caesarean section process, and to



decrease the caesarean section-related physical and psycho-social problems (Şahin, 2009).

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