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Income-expense analysis in medical institutions-Application in Turkey

Faruk Dayi^{a*}, Yusuf Esmer^b, Mehmet Civan^c

^a Department of Foreign Trade, Tosya Vocational School, Kastamonu University, Kastamonu 37300, Turkey

^b Department of Tourism and Hotel Management, Vocational School, Sinop University, Sinop 57000, Turkey

^c Department of Business Administration, Faculty of Economic and Administrative Sciences, Gaziantep University, Gaziantep, 27100, Turkey

Abstract

In medical sector a huge reform has started by health transformation program came into effect in 2003 in Turkey. The primary purpose is to provide to level up the service standard of the public hospitals with the same one of the private hospitals, even maintaining this service standard increasingly. The Public Hospitals Association was established for levelling up the service quality of the public hospitals and optimization of their financial capabilities in 2011. So, the necessary infrastructure is prepared for both serving the patients and making profit. Therefore, financial statements and various statistical information of 10 public hospitals in Zonguldak have been analysed. The implementation consists of data belong to 2009-2012 period. According to findings obtained the income of the public hospitals increased between 2009-2012 periods. However, the expenses have increased more.

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1. Introduction

By implementation of “Health Transformation Program” in medical sector it took a new turn in 2003 in Turkey. The economical objective of this program is to provide the implementation of neo-liberal economical politics in medical sector, as well. By raising the standard of health service provided by the state, the Health Transformation

* Faruk Dayi, Tel.:+90 366 280 22 56; fax.:+90 366 313 21 50.

E-mail address: fdayi@kastamonu.edu.tr

Program offers an effective and productive service. This can only be carried out by placing more importance on financial management in public health institutions (Ercan et al., 2013, p.55-56). By optimization in cash management and debt follow-up the same result can be obtained in financial management of health institutions, as well (Bertoneche and Knight, 2001, p.90).

Today's technology is in a rapid and continuous change and development. Each passing day advancing technology is being used more for enhancing the quality of the health services. However the prices of newly discovered and produced medical devices are quite high and then this causes the health institutions making higher investment. The increasing costs are continuously rising against undetermined prices which causes damage of the businesses, even collapsing of them (Gourieroux and Jasiak, 2007, p.1-2). Because as the debt increases, so does the financial risk (Ercan and Ban, 2008, p.189). The financial structure is deteriorated in this way (Civan and Dayi, 2013, p.13).

Providing efficiency and productivity are aimed in administration of expenses of the public health institutions by Health Transformation Program (Dayi, 2013, p.1). For realizing this income and expense management must be considered important (Dayi and Akdemir, 2013, p.2-4).

2. Literature

In this section some brief information is given about medical sector in Turkey. Afterwards, the institutional service evaluation indications of Ministry of Health of Turkish Republic are explained in two parts. The first part is about income indications and the second one is about the indications of expenses (Ministry of Health of T.R., 2013, p.43).

2.1. Current Situation of Medical Sector

In this part a short evaluation shall be carried out by macro indications about the medical sector in our country. First of all, when we look at the population in Turkey, we see an increase in the amount of population like from 56,4 millions in 1990 to 76,7 millions in 2013. Therefore, in parallel with increase in the population, also an increase in health expenditures is being observed. By "Health Transformation Program" started to be implemented in 2003 a noticeable rising is being seen in service quality of our hospitals. In terms of either the number of doctors or medical devices and equipment the hospitals in any region of our country have been equipped with cutting-edge technology. According to data from 2013 together with general hospitals there are 17 type branch hospitals in our country. Total bed numbers are 202.031. Examining the quality bed numbers there were 18.924 quality beds in 2002; this number rose to 92.542 pieces in 2013. When quality bed numbers data for 2012 compared to other countries, Turkey's average quality bed number 26,4 one per ten thousand, the World average is 27 and the average of European Union countries is 50,8 (Statistics of Ministry of Health, 2013, p. 72-73). It can be seen that we have a low number in terms of quality bed either on the basis of European Union countries or in the world. As for the numbers of hospital patients about 5,5 million people were in-patient in 2002. When it came to 2013 this number reached about 12,5 million persons. So, the increase amount of in-patient is about 127% (Statistics of Ministry of Health, 2013, p.104).

In 2002 the application number of the patients to a hospital was about 125 millions, this number rises about 380 millions in 2013. The application number to second and third line hospitals was 2,0 per doctor, this number rose to 5,3 in 2013 (Statistics of Ministry of Health, 2013, p.101). After having examined the numbers of the medical staff we see the following numbers: total number of the doctors in 2002 was 91.949, total medical staff were 378.551 persons; in 2013, however, the number of total doctors was 133.775, total medical staff were 735.159 (Statistics of Ministry of Health, 2013, p.136-137). According to international benchmarking the number of doctors was 174 per one hundred thousand in 2013 in Turkey. This number was 325 in European Union countries (Statistics of Ministry of Health, 2013, p.139).

With respect to health expenditures our country's GDP was 233 billion \$ and the realized health expenses was 12.2 billion \$ in 2002. This amount corresponded to 5, 2% of the GDP. By 2013 the GDP 786, 5 billion \$, the total health expenses 40, 5 billion \$ which corresponds to 5, 1 % of the GDP. So, there is not any significant change in health expenditures within the last 10 years. Public health expenses on the other hand, for per person was 753\$ in 2013 in our country. This amount has been realized as 2.168\$ in European Union countries (Statistics of Ministry of Health, 2013, p.130). Therefore, the investments in health sector should be increased in Turkey. In that way the

investment expenses increases and risk levels of the health institutions decreases (Paterson and Wendel, 1996, p.20).

2.2. Service Evaluation Indications Regarding Incomes

Financial performances and evaluations of public health institutions are carried out by service indications determined by Ministry of Health of Turkish Republic herself. In this part institutional service performance indication for income shall be examined and five important indications shall be explained.

- **Income Per Examination:** Income per examination is calculated by dividing total examination number in one year to total income in that year. As the number of examination increases, rising in income is also expected.
- **Income Per Bed:** Income per bed is calculated by dividing total income realised in one year to the number of beds. In fact, it is expected that as the number of having examined patients increases, the examination incomes also rise, but when the number of hospital patients does not increase, a significant increase is not observed in incomes of the hospitals.
- **Income Per In-Patients:** Calculated by dividing total income to total number of hospital patients in that year. If the number of the hospital patients are high, the incomes of the hospital are getting higher, as well. As there is not any in-patients in Mouth and Teeth Health Clinics, these places are out of the scope of the analysis.
- **Income Per Doctor:** Calculated by dividing one year's income of the public hospital to total number of doctors serving in that year.

2.3. Service Evaluation Indications Regarding Expenditures

Expenditure is the expense or consumption for achieving economic benefit from the activities carried out by the business (Buyukmirza, 2013, p.53). The expenditures of the public hospitals are high which is an important problem. Therefore we can say that the health institutions do not have an effective expense management. In this part we are dealing with important expenditure subjects in respect of institutional service performances.

- **Expense Per Examination:** An important rate can be used for comparing both financial and institutional performances of the public hospital. It is calculated by dividing one year's total expenditure of the health institution to total examination number realized within one year.
- **Expense Per Bed:** It is calculated by dividing total expenditure of the Hospital for one year to total bed number. At Mouth and Teeth Health Clinic 1 and Mouth and Teeth Health Clinic 2 only outpatient treatment is available, that is why these institutions are out of the scope of expense per bed analysis.
- **Expense Per In-Patient:** The rate of expense per in-patient is calculated by dividing one year total expenditure of public hospitals to total number of in-patients in that year.
- **Expense Per Doctor:** Calculated by dividing total expenditure of the public hospital for one year to number of doctors in charge during that year.

3. Findings

Our study has been carried out by using the data of Zonguldak province located in the region of Black Sea. The analysis has been carried out by using financial statements of the public health institutions subject to Zonguldak Public Hospitals Association and some data belong to them. The implementation of the work includes the period of 2009-2012. Because of renewal in electronic information system the data before 2009 cannot be reached. The purpose of our study is to put forward the financial performance of the period before the Public Hospitals Association was established.

3.1. Analysis Results About Incomes

In this part by utilizing various statistical information about the incomes of the health institutions an analysis was made. The obtained findings are as follows: income per examination, income per bed, income per in-patient and income per doctor.

3.1.1. Income Per Examination

The results of analysis of income per examination can be found at Table 1 below. When we look at the results of analysis of income per examination in Zonguldak, we see that the income is increasing in every passing day. Comparing with data for 2012 average of income per examination in Turkey is 81,23 ₺, the average of Zonguldak province is 52,63 ₺. Comparing with 2012, average income per examination for 10 health institutions in Zonguldak province are quite below the average of the country.

Table 1. Results of analysis of income per examination(₺)

Health Institutions	2009	2010	2011	2012
Mouth and Teeth Health Clinic 1	40,73	32,72	48,50	55,64
Hospital 1	45,01	33,25	36,70	43,42
Hospital 2	46,13	54,08	56,53	60,78
Hospital 3	46,33	47,65	42,87	35,99
Hospital 4	28,60	29,58	35,04	44,03
Mouth and Teeth Health Clinic 2	0,00	32,14	42,23	49,20
Hospital 5	39,76	43,39	45,21	49,26
Hospital 6	74,23	97,67	103,99	117,05
Hospital 7	26,00	22,50	23,90	27,11
Hospital 8	34,59	36,54	37,95	43,83
Average of Zonguldak Province	38,14	42,95	47,29	52,63
Average of Turkey	-	-	-	81,23

According to Table 1 average of income per examination for Zonguldak province has been realized as 38,14 ₺, 42,95 ₺, 47,29 ₺ and 52,63 ₺ by years respectively. Income of hospital 6 per examination was 74,23 ₺ in 2009, by 2012 it rose 117,05 ₺. It become the hospital having the highest examination income within the province.

3.1.2. Income Per Bed

The results of analysis of income per bed was given below Table 2. The country average of income per bed was 94.194 ₺ in 2012. At the same year the average of income per bed for Zonguldak province was 116.756,50 ₺. Zonguldak's average income per bed is 22% higher than the country average.

Table 2. Results of analysis of income per bed (₺)

Health Institutions	2009	2010	2011	2012
Hospital 1	110.131,81	145.370,52	144.983,02	130.113,39
Hospital 2	81.353,85	80.254,23	103.684,92	115.843,40
Hospital 3	88.741,78	108.733,82	114.257,86	107.352,22
Hospital 4	66.356,79	88.340,56	109.063,76	108.027,44
Hospital 5	77.617,81	80.397,64	80.397,64	83.604,36
Hospital 6	40.760,33	45.648,75	53.489,61	51.046,88
Hospital 7	287.114,95	257.244,61	246.037,35	268.823,12
Hospital 8	63.130,27	67.314,65	69.778,58	69.241,20
Average of Zonguldak Province	101.900,95	109.163,10	115.211,59	116.756,50
Average of Turkey	-	-	-	94.194,00

Hospital 7 is the health institution where the income per bed highest in Zonguldak Province. As the number of beds in the hospital mentioned above is much lower when compared to the other health institutions, and this resulted

in calculation of high income per bed. Hospital 6 is the health institution having lowest income per bed in the province.

3.1.3. Income Per In-Patients

The results of analysis of income per in-patient are submitted in Table 3 below. According to results of income per in-patient between 2009-2012 period, the income per in-patient increased in 2010 and decreased in 2011 and 2012. In our country the average income per in-patient is 2.703 ₺ in 2012. This amount is 2.547,87 ₺ in Zonguldak.

Table 3. Results of analysis of income per in-patient(₺)

Health Institutions	2009	2010	2011	2012
Hospital 1	6.866,07	2.879,76	2.983,19	3.385,06
Hospital 2	2.567,83	2.661,29	2.696,73	2.291,13
Hospital 3	1.685,79	1.741,98	1.995,97	2.024,93
Hospital 4	2.897,43	2.619,40	2.730,61	2.164,79
Hospital 5	1.619,88	1.630,12	1.837,58	1.888,20
Hospital 6	1.355,89	1.501,88	1.564,15	1.684,56
Hospital 7	-	7.499,84	6.374,02	6.040,97
Hospital 8	1.030,75	970,79	921,53	903,30
Average of Zonguldak Province	2.574,81	2.688,13	2.637,97	2.547,87
Average of Turkey	-	-	-	2.703,00

Generally in Zonguldak province the Hospital 8 is the institution having lowest income per in-patient; the highest one is Hospital 7. In fact, newly opened number of seventh hospital's bed capacity is only 10 beds which results in high calculation of the income per in-patient.

3.1.4. Income Per Doctor

The results of analysis of income per doctor can be found in Table 4 below. The average income per doctor in 2012 was 262.669,00 ₺ throughout the country. This average is 445.518,76 ₺ in Zonguldak. The average of Zonguldak province is about 1,7 times more than the country average.

Table 4. Results of analysis of income per doctor(₺)

Health Institutions	2009	2010	2011	2012
Mouth and Teeth Health Clinic 1	266.338,12	180.697,10	307.054,30	344.927,92
Hospital 1	550.659,05	302.855,26	278.813,50	416.362,84
Hospital 2	310.007,46	396.008,60	510.648,24	595.334,32
Hospital 3	352.277,99	374.845,55	467.743,10	520.857,06
Hospital 4	241.728,30	204.789,48	252.829,62	324.082,31
Mouth and Teeth Health Clinic 2	-	164.641,48	233.617,16	257.464,84
Hospital 5	497.739,58	436.943,72	436.943,72	540.545,44
Hospital 6	541.000,73	589.283,89	949.440,51	906.082,18
Hospital 7	358.893,69	367.492,30	223.670,32	268.823,12
Hospital 8	315.651,37	296.976,41	436.116,14	280.707,57
Average of Zonguldak Province	381.588,47	331.453,38	409.687,66	445.518,76
Average of Turkey	-	-	-	262.669,00

Income per doctor is following an increase trend within 4 years period and has risen about 17 %. The hospital having highest income per doctor is Hospital 6. The institution having lowest income per doctor is Mouth and Teeth Health Clinic 2. Actually, it is considered the income per doctor shall be risen, as the number of doctors increase.

However, the results of analysis indicate that increasing the number of doctors causes decreasing the income per doctor. In fact, the doctors are increasing the incomes of the hospitals but applying wrong treatment methods on the patients unwittingly results in patients suit for damages and as a result the hospitals are being convicted to indemnity in huge amounts (Cagliano et al., 2011, p.695-696).

3.2. Results of Analysis Regarding the Expenditures

In this part an analysis was made by utilizing various statistical information about expenditures of the health institutions. The obtained findings are as follows; expense per examination, expense per bed, expense per in-patient and expense per doctor.

3.2.1. Expense of Examination

The results of analysis of expense per examination are given in Table 5 below. As of years the expense per examination has risen. For 2012, the average of Zonguldak province was 51,39 ₺, Turkey's average is 76,04 ₺.

Table 5. Results of analysis of expense per examination(₺)

Health Institutions	2009	2010	2011	2012
Mouth and Teeth Health Clinic 1	25,78	27,92	34,62	39,39
Hospital 1	27,05	36,24	42,18	46,76
Hospital 2	56,04	61,45	60,14	62,51
Hospital 3	51,56	50,17	45,56	38,50
Hospital 4	26,84	26,23	33,79	45,06
Mouth and Teeth Health Clinic 2	29,54	27,06	31,54	36,55
Hospital 5	41,81	42,90	49,19	51,58
Hospital 6	90,69	106,30	115,95	117,59
Hospital 7	15,88	16,67	20,59	23,27
Hospital 8	38,06	40,80	46,80	52,58
Average of Zonguldak Province	40,32	43,57	48,04	51,39
Average of Turkey	-	-	-	76,04

Hospital 6 is the public hospital having highest expense per examination in Zonguldak. For the hospital the expense per examination was 90,69 ₺ in 2009. This amount rose to 117,59 ₺ in 2012. Rising of expenses of the hospital each passing year results in rising the average of Zonguldak province, as well.

3.2.2. Expense Per Bed

The results of expense per bed for public hospitals can be found in Table 6 below. As of the years the results of analysis of expense per bed in Zonguldak province; 87.786 ₺, 94.770 ₺, 118.591 ₺ and 117.029 ₺ respectively. The expenses are increasing year by year, but it decreased in 2012 very slightly.

Table 6. Results of analysis of expense per bed (₺)

Health Institutions	2009	2010	2011	2012
Hospital 1	66.182,51	79.202,92	166.622,60	179.366,02
Hospital 2	98.837,38	91.190,62	110.303,16	119.131,53
Hospital 3	98.761,66	114.490,23	121.429,06	114.839,44
Hospital 4	62.286,01	78.321,71	105.162,07	110.549,25
Hospital 5	81.635,30	79.486,36	87.471,95	87.546,04
Hospital 6	49.801,06	49.682,38	59.641,35	62.273,59
Hospital 7	175.323,44	190.628,56	212.041,97	230.749,03
Hospital 8	69.468,18	75.161,50	86.059,88	83.063,62

Average of Zonguldak Province	87.786,94	94.770,54	118.591,50	117.029,42
Average of Turkey	-	-	-	85.652,00

Hospital 7 is the hospital having highest expenses in Zonguldak province. Since it was established, it serves with only 10 bed capacity, which causes high calculation of rate of expense per bed.

3.2.3. Expense Per In-Patient

The results of analysis of expense per in-patient at public hospitals are given in Table 7 below. Having evaluated the results of analysis a regular decrease in expenses per in-patient was determined. Besides, the mentioned expenditure's average for Zonguldak province is below the average of country.

Table 7. Results of analysis of expense per in-patient (₺)

Health Institutions	2009	2010	2011	2012
Hospital 1	4.126,09	4.937,84	3.300,76	3.690,66
Hospital 2	3.119,68	3.023,95	2.868,86	2.356,16
Hospital 3	1.876,13	1.834,20	2.121,24	2.166,16
Hospital 4	2.719,68	2.322,33	2.632,92	2.215,33
Hospital 5	1.703,72	1.611,65	1.999,27	1.977,22
Hospital 6	1.656,63	1.634,59	1.744,04	2.055,04
Hospital 7	17.358,76	5.557,68	5.493,32	5.185,37
Hospital 8	1.134,24	1.083,96	1.136,55	1.083,63
Average of Zonguldak Province	4.211,87	2.750,77	2.662,12	2.379,65
Average of Turkey	-	-	-	2.483,00

From 2009 expense per in-patient began to decrease and reached at lowest level of the last 4 years in 2012. Province average for Zonguldak in terms of expense per-inpatient in 2012 was 2.379,65 ₺, however the country average was 2.483 ₺. Decreasing the expense of per in-patient as of the years shows us that treatment expenditures of hospital patients have been controlled and thus the productivity are increasing.

3.2.4. Expense Per Doctor

The results of analysis of expense per doctor are given in Table 8 below. It was determined a regular increase in expense per doctor between 2009-2012 period. Accepting as a 100% basis the expense per doctor for 2009 and making a trend analysis, an increase is seen to 100,87% in 2010, 127,55% in 2011 and to 134,41% in 2012 (Akdogan and Tenker, 2007, p.600). In four years period the expenditure increased 34%.

Table 8. Results of analysis of expense per doctor (₺)

Health Institutions	2009	2010	2011	2012
Mouth and Teeth Health Clinic 1	168.579,37	154.203,58	219.212,64	244.160,58
Hospital 1	330.912,54	396.014,60	347.130,41	344.934,66
Hospital 2	376.630,31	449.973,39	543.243,04	612.232,49
Hospital 3	392.053,87	394.690,01	497.100,23	557.183,93
Hospital 4	226.899,05	181.563,96	243.784,80	331.647,75
Mouth and Teeth Health Clinic 2	116.902,70	138.606,73	174.467,45	191.276,53
Hospital 5	523.502,58	431.991,11	475.391,06	566.030,43
Hospital 6	660.995,92	641.354,41	1.058.633,89	1.105.356,25
Hospital 7	219.154,30	272.326,52	192.765,42	230.749,03
Hospital 8	347.340,91	331.594,85	537.874,25	336.744,42
Average of Zonguldak Province	336.297,16	339.231,92	428.960,32	452.031,61

Average of Turkey

239.252,00

The average expense per doctor working for public hospitals in Zonguldak province was 452.031 ₺ in 2012, the average of Turkey was realized as 239.252 ₺. Expense per doctor in Zonguldak is almost double of country average.

4. Conclusion

The revenues of Zonguldak Public Hospitals Association have been risen within four years period regularly. Although, the share of the public hospitals getting from the state is decreasing year by year, increasement in their sales revenues is increasing the total income. While the revenues of the hospitals are increasing, the expenses incurred to be seen are increasing more than the revenues. As accepting a basis of 100 % by selecting the year of 2009, it was determined that these expenses had risen to 116 % in 2012. If total expenses are divided into two parts as fixed costs and variable expenses by selecting 2009 as a basis year and accepting 100%, the fixed costs to be seen rose to 131% in 2012; the variable expenses decreased to 79 % in the same year (2012). Increasement in fixed costs results in decrease in variable expenses.

Rising of income per examination is expected by increasement in the number of examination. Income per examination increased 36% between 2009-2012 period. Within the same period expense per examination continously increased and rose about 25%. Thus, it is concluded that productivity in income per examination was provided. Examining the results of analysis of income per bed, to be observed the income per bed had 15 % rising in four years period. By evaluating analysis of expense per bed it seems that there is an increasement between 2009-2011 period, a decreasement in 2012 and within four years period increasement about 34%. One of the reasons that the expense per bed is increasing is that the number of beds remaining inactive is high. This is because some costs shall have to be incurred for that bed, even if in-patients are not available at the hospitals having many beds.

Income per in-patient is rising by increasing the number of in-patients. By evaluating the results of 2009-2012 period, it was determined that income per in-patient did not increase, on the contrary it decreased 1%. As for the expense per bed, the average expense for Zonguldak province decreased about 45% in 2009-2012 period. By examining the results of analysis of income per doctor the income increased 16%, the expense have risen regularly and increased about 34%. In the studies the most important reason of the increasement in expense per doctor is seen the rising in additional payments of the doctors.

In our study, incomes and expenses of 10 public hospitals active in Zonguldak province were examined by various indications and the data for 2012 have been compared to the average of the country. The main purpose of our study was putting forward the performance of Turkey, by comparing the data to both country's data and OECD data. However, deficiency of data and difficulties with accessing each data prevent the study's being in this direction unfortunately. In the next studies different indications that shall examine the incomes and expenses of the public health institutions can be derived and these indications can be compared with both on regional and countries basis. Comparison was not made with economical indications such as GDP, Turkey's annual health spending, macroeconomic indications separately. As in comparing the health spending in the world using microeconomic indications instead of macroeconomic ones shall be meaningful for getting better results

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