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The Correlation Analysis of Relative Values of DRGs and the National Health Public Health Service Tariffs in Turkey

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ABSTRACT

This study aims to analyze the correlation between the prices of public health service tariff (SUT) based on fee for service in Turkey with the DRGs which have being disseminated since 2009 in public hospitals in Turkey.

For this analysis, the inpatient patient data of Istanbul Haydarpaşa Numune Training and Research Hospital for 2015 were taken as basis and the 28,493 files that the hospital sent to Social Security Institution (SSI) and provisioned via SUT and the accrued amounts were obtained. Then the DRGs were obtained from the Ministry of Health's DRG application for the same cases. DRGs with fewer than 3 files were excluded from the calculation and 28,365 files were studied.

The correlation between the SUT prices of 28,365 files and the DRG's relative values of each file were calculated as 0.67 (medium related). The correlation between the average SUT prices of the 403 DRG groups corresponding to these files and the relative values were calculated as 0.79 (high correlation). When we investigate this relation based on the major diagnostic classification (MDC) of the DRGs, the relation between the file prices and the DRG relative values

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are calculated as very weak in 7 MDCs, weak in 9 MDCs, medium in 5 MDCs, high in 1 MDC. The relationship between average SUT prices of each DRG group and their relative values are also calculated as very weak in 1 MDC, weak in 4 MDCs, medium in 4 MDCs, high in 8 MDCs and very high in 5 MDCs.
The result of this analysis shows us the public healthcare service prices are medium and/or highly related with the relative values of DRGs applied in Turkey. Moreover, there are some issues to study on particularly DRGs of some MDCs which have weak and very weak relation with SUT prices (or vice versa).
Keywords: DRG, Diagnosis Related Groups, Correlation, Fee for Service, National Tariffs,

INTRODUCTION

As much as the service itself in the management of healthcare in the world, the payment models of health care are also important. The important stakeholders that make up the healthcare system are health service servers, people receiving services and repaid institutions. In Turkey, the reimbursement model and the person receiving the service are paid to the institution serving the appropriate by source according to the health assurance. Widely used and accepted payment models are as follows (Uzman, 2015):

1. Fixed budget-based payment
2. Pay per service
3. Pay per capita
4. Pay per diem
5. Pay per case

Among these models, the case-based payment model, which has been increasingly widespread in the last 30 years, is built on Diagnosis related groups-DRG. Originally reformed by Fetter and his friends at Yale University in the 1960s (Robert B. Fetter, n.d.) DRG, has emerged in other countries in this area. The world's leading countries in terms of DRG use are seen as Australia, Canada and Norway (Başara, 2015). The first purpose of the emergence of DRG is to measure the costs of hospitals ' services and to help increase their productivity with a performance-based approach (Robert B. Fetter, n.d.). However, the case-based grouping capacity of the services provided by the DRG, in a very short time with the attention of health repayment institutions,

a period of time after the DRG "pay per case" model was born (Narmanli et al., 2012) and is among the performance-based refund models in healthcare institutions (Lilford, Richard J, Brown, Celia A, & Nicholl, 2007). The case-by-case payment model, starting from the hospital patient's discharge, determination of the case group (DRG) based on the diagnosis by a grouper (Narmanli et al., 2012) and mentioned health service. According to the relevant DRG is based on the basis (AKYÜREK, 2012). DRG has a numerical value (relative value) that represents the size of the cost. In principle, the relative value of each DRG is expected to be determined periodically according to the average health service costs calculated throughout the country (Ayanoğlu, Beylik, & Orhan, 2014) (TÜKEL, 2010).

The payment to a case is not only the DRG that the case belongs to, it also depends on the case mix index, which shows how many health services the hospital offers (Turkish Republic Ministry of Health DGS Directory, 2014). As such DRG implementation, it offers a simple, flexible and traceable model according to the methods of pay per service, etc. for reimbursement agencies (Narmanli et al., 2012).

It is seen that countries that do not have DRG use DRG in numbers ranging from 600 to 1387 (K.Aksoy, 2017), they collect these groups under the Major Diagnostic Category (MDC), which varies between 20-40 (Güler, Şencan, Şeker, & Demir, 2013).

DRG APPLICATION IN TURKEY

The largest share of health assurance in Turkey belongs to the state-owned Social Security Institution (SGK). SGK has been actively implementing the pay-per-transaction model through the MEDULA system, which is a central provision system which is a central provision system implemented in 2007. The health process codes and all payment rules are updated annually in the pay-per-transaction model and are stated in the Health Service Tariff (SUT). Although a package-based structure is included in the SUT, especially for surgical procedures, these packages consist of a number of groupings made for easy operation of the pay-per-transaction model, rather than a case-based analysis, such as DRG. The Ministry of Health of the Republic of Turkey from 2009 to the global budget implementation, as well as payments made

to state hospitals, both SUT and DRG have begun to be referenced together. However, the SUT is a model that requires a process/package based and pre-service provision; DRG is based on the weight of the DRG group (relative value) and Case Mix index (VKI) which is based on the final discharge data set, which is confirmed after the patient is discharged (Hakan İstanbulluoğlu, Mahir Güleç, 2010). In addition, the functioning of the need of SUT and DRG and the different types of wages that they correspond to are a major risk for hospitals to be subjected to significant revenue losses during the transition from the pay per case model. Indeed, in 2009, the fees for the specified SUT have not been changed since then. In addition, these fees are determined and there is no average cost account across the country. On the other hand, the DRG used in Turkey has been transferred from the Australian model and a comprehensive cost study has not been made about how the relative values of 661 DRG correspond. For this purpose, although a project called "Infrastructure development project for strengthening and restructuring of health services financing structure" was conducted in cooperation with the Ministry of Health, SGK and Hacettepe University between the years 2005-2009, due to technical and practical difficulties in measuring the costs of health services, DRG's relative values have not been able to be determined (Yap & Yap, 2007).

As a result, what is used as a pay-per transaction model sin 2007, neither SUTs (SUT's; nor could we say that DRG) nor DRG were charged according to the National Health Service costs. This model became commonly used beginning in 2009.

In addition, if the same service is paid with the SUT and DRG the difference in the price varies, as a significant risk to the proliferation of DRG. However, there was no study of the differences between the SUT prices in Turkey and the DRG relative values or how the relationship was related.

It is known that the prices of the SUT and DRG relative values do not represent the exact same thing. SUT prices, not the cost of hospitals, it represents the amount (fee) payable by SGK in exchange for the service (Prof. Dr. M. Raşit TÜKEL, 2010). On the other hand, it is not entirely independent of the costs of the service with the current SUT prices; the amount to be paid to the hospital from the country is taken into consideration as the amounts of SUT. DRG Relative values must be calculated in principle based on local service,

consumables and device costs. However, there has been no comprehensive change in the relative values of DRG transferred from Australia, the relative values cannot be claimed to represent the costs in Turkey. In this case, the dispute between the DRG relative values in Turkey and the calculated case rates based on the SUT is a subject worth examining.

The aim of this study is to analyze the relationship between DRG relative values that correspond to the same cases as the service amounts accrued according to the price of the SUT in the pay for service model in Turkey.

The following sections of the article are defined as follows: Part 2 will mention the scope of our research and the methods implemented, and the results obtained are shared in section 3. In the last chapter, the results will be evaluated, and some suggestions are offered for further studies.

METHODS

The methods implemented in the study are given in order. It was evaluated under 4 main headings as data acquisition, pre-processing and data conversion, visualization and analytic, and correlation analysis.

DATA ACQUISITION

In the research, the SUT and DRG data of Haydarpaşa Numune Training and Research Hospital was obtained from the year 2015. The headings contained in the raw data set are respectively; the patient's service, DRG code, DRG description, relative value, SUT invoice price, hospitalization date, release date, diagnosis, type of admission, permission status, number of days of hospitalization, score, age, year of birth, branch, output shape, transaction codes are in the form.

DATA PREPROCESSING AND DATA CONVERSION

Data quality criteria were taken into consideration by examining the headings in the raw data set and data was passed through a pre-processing and data conversion. Data types (nominal, sequential, continuous, interval, etc.) of data obtained by the data quality criteria are considered to be incomplete, noisy or inconsistent. In addition, the number of cases with fewer than 3 DRG is considered to affect the average in the correlation analysis, the relevant

DRG is excluded from the study scope. As a result of these transactions, the number of files in raw data obtained from the hospital in 2015 28,493, the number of DRGs is 670, the total file amount is 41,175,821 TL. After the data cleaning process, the number of files after data cleanup is 28,365, the number of DRGs is 403, and the total file amount is 40,849,813 TL. Analysis studies were handled with data after data cleansing.

VISUALIZATION AND ANALYTICS

After data cleansing, the underlying data is visualized with the Business intelligence tool called Qlikview Personal EditionTM, and a summary table was created by editing the headings in the raw data set.

However, a summary table that creates work has created a good perspective for us to see all the data. The total number of files in the headers on the summary table, relative value, minimum amount of SUT (TL), maximum amount of SUT (TL), average amount of SUT (TL), total amount of SUT (TL), average amount/relative value, minimum hospitalization time (days), maximum hospitalization time (days), The average hospitalization time (days) is detailed and the information on the entire data set has been revealed in detail.

CORRELATION ANALYSIS

Based on the analysis screens developed with Qlikview, the correlation between the amounts in DRG files related to DRG relative values were calculated mainly on the basis of "amount per relative value on MDC and DRG." Correlation analysis for all DRG; both are made separately for each DRG and the correlation values were calculated.

Thus, MDCs that are more dissociated relative to the SUT amounts by their relative values of corresponding DRGs have also been identified. Also, as the correlation between the SUT amounts and the corresponding relative values of all the cases were calculated; the average SUT amount for each DRG was calculated instead of the direct file amounts and the correlation between these average amounts and the corresponding DRG relative values were also calculated. Thus, the effect on the correlation of different SUT amounts to the same DRG could be examined separately. Correlation coefficient strength was determined by referring to the following value range.

0.01 – 0.25 Very Weak Relationship
0.26 – 0.49 Weak Relationship
0.50 – 0.69 Medium relationship
0.70 – 0.89 High Relationship
0.90 – 1.0 Very High Relationship

RESULTS

In this study, the correlation analysis between DRG relative values and the corresponding SUT prices are based on the data of the Haydarpaşa Numune Training and Research Hospital, which is one of the high-end hospitals in Turkey with Case mix Index of 2015 Made. The resulting 28,493 files have been transformed into 28,365 files after the data cleanup phase.

Two different approaches are based on analyzing the relationship/ correlation between the DRG relative value of each file and the fee calculated according to SUT.

In the first analysis, correlation between the amounts of SUT and the relative value were analyzed. The correlation between DRG relative values and the amounts of SUT are found to be 0.67, corresponding to each of the 28,365 files in the data set. This value shows us that the correlation coefficient is "medium relationship" power.

In the second analysis, the 28,365 file corresponds to 403 different DRG, the average amount of SUT calculated and 403 DRG group's average SUT fee related to DRG's relative value of the correlation were investigated. As a result of this analysis, the correlation coefficient was calculated as 0.79. This value also shows us that the correlation is "high-relationship".

In comparison with the amounts of all the files and the average SUT amounts are relative values of the correlation layer of the number forces associated with the middle and the high relationship emergence of the distribution of the number of files in MDC groups, namely the strength of correlation coefficient. This leaves one wondering how it would affect the results. In this context, according to the correlation of MDC groups for each data set, the following table 1 has been compared with the analysis of the correlation analyses on MDC basis for both analyses.

Table 1: Comparison of correlation recent analyses on MDC basis

MDC Group	DRG Number	Number of files	1.Analysis Correlation Coefficient value	1.Analysis Correlation Coefficient power	2.Analysis Correlation Coefficient value	2.Analysis Correlation Coefficient power
MDC - 01 Nervous System Diseases	31	1462	0,08	Very Weak Relationship	0,22	Very Weak Relationship
MDC - 02 Eye diseases	19	5713	0,11	Very Weak Relationship	0,35	Weak Relationship
MDC - 03 ENT and Oral Diseases	23	1741	0,43	Weak Relationship	0,90	Çok High Relationship
MDC - 04 Respiratory System Diseases	24	3124	0,50	Medium relationship	0,36	Weak Relationship
MDC - 05 Circulatory System Diseases	22	311	0,21	Very Weak Relationship	0,75	High Relationship
MDC - 06 Digestive System Diseases	38	2326	0,64	Medium relationship	0,81	High Relationship
MDC - 07 Hepatobiliary System and Pancreas Diseases	22	1480	0,61	Medium relationship	0,84	High Relationship
MDC - 08 Musculoskeletal and Connective Tissue Diseases	57	2531	0,88	High Relationship	0,77	High Relationship
MDC - 09 Skin, Subcutaneous (Subcutaneous) Tissue and Breast Diseases	20	1375	0,18	Very Weak Relationship	0,54	Medium relationship
MDC - 10 Endocrine, Nutritional (Nutrition) and Metabolic Diseases	16	676	0,43	Weak Relationship	0,35	Weak Relationship
MDC - 11 Kidney and Urinary Tracts (Urinary Tract) Diseases	26	1966	0,30	Weak Relationship	0,75	High Relationship
MDC - 12 Male Reproductive Organs Diseases	12	490	0,42	Weak Relationship	0,71	High Relationship
MDC - 13 Female Reproductive Organs Diseases	12	1276	0,60	Medium relationship	0,97	Çok High Relationship

MDC - 14 Pregnancy, birth and puerperium	9	479	0,49	Weak Relationship	0,99	Çok High Relationship
MDC - 15 Newborn (and Other Neonates)	7	133	0,62	Medium relationship	0,89	High Relationship
MDC - 16 Blood and Blood-making Organs and Immune Diseases	9	753	0,22	Very Weak Relationship	0,36	Weak Relationship
MDC - 17 Neoplastic diseases (Hematological and solid neoplasms)	9	127	0,31	Weak Relationship	0,78	High Relationship
MDC - 18 Infectious and Parasitic Diseases	12	222	0,37	Weak Relationship	0,79	High Relationship
MDC - 19 Mental Health Disorders	9	399	0,30	Weak Relationship	0,58	Medium relationship
MDC-20 Alcohol / Drug Use and Alcohol / Drug-induced Organic Mental Health Disorders	1	3	-	Correlation Not analyzed.	-	Correlation Not analyzed.
MDC - 21 Injuries, Poisoning and Toxic Drug Effects	11	313	0,24	Very Weak Relationship	0,56	Medium relationship
MDC - 22 Skin Burn	8	2	It is excluded from the analysis due to the number of files.	-	It is excluded from the analysis due to the number of files.	-
MDC - 23 Factors Affecting Health and Other Types of Contacts Established by Health Services	13	1162	0,12	Very Weak Relationship	0,52	Medium relationship
Leading Major Diagnostic Classes	12	303	0,49	Weak Relationship	0,91	High Relationship

DISCUSSIONS

Based on all these results, the current relative values for the 403 DRG group can be said to be medium-high in relation to the prices of SUT. However, when we do the correlation analysis on MDC basis, the correlation between file

amounts and DRG relative values have been found to be very weak in 7 MDC, weak in 9 MDC, and 5 in MDC, and one in MDC. The correlation between average SUT amounts and relative values per DRG group was found to be very weak in 1 MDC, weak in 4 MDC, medium in 4 MDC, high in 8 MDC and 5 in MDC.

All these analyses are related to medium-high DRG relative values applied in Turkey with the prices of SUT; However, some arrangements can be made based on the relative values of DRG in the MDC groups which are particularly weak and very weak related, and/or the prices of the related SUT.

The most valuable information that our dissertation study will reveal for people who are deciding on DRG relative values is that the amount of the SUT in the data set/the relative Value section resulting from the data set average is too high or too low, the DRG's is determined. In this context, the data set we have, the average amount of SUT per DRG Group/relative value is sorted in ascending order. The following tables illustrate the DRG, which enters the lowest and highest level of 15% of the section result. In this way, decision makers can focus directly on these DRG and make appropriate changes in DRG relative values or in the amount of SUT or both, making the result of this section closer to the average of the data set (1,044 TL).

Table 2: The lowest value DRGs according to the average SUT Amount / Relative Value portion of the data set

MDC_Name	DRG	DRG_Name	Number of Files	Relative Value	Average SUT Amount	Average Amount / Relative Value
Leading Major Diagnostic Classes (MDC)	A41A	Intubation, under age 16, KK Found	3	21,85	1.043	48
MDC - 15 Newborn (and Other Neonates)	P66C	Newborn, Applied Weight 2000-2499 g, without a Major Operation Theater Operation, accompanied by a Different Problem	4	2,51	295	118
MDC - 17 Neoplastic diseases (Hematologic & solid neoplasms)	R61C	Lymphoma and Non-Acute Leukemia Within the Same Day	3	0,23	32	140

MDC - 11 Kidney and Urinary Tracts (Urinary Tract) Diseases	L67A	Kidney and Urinary Tract Diagnosis, Other, Catastrophic CK Found	4	3,36	588	175
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I68C	Spinal Diseases, Non-Surgical, In the Same Day	8	0,36	66	184
MDC - 01 Nervous System Diseases	B02B	Craniotomy, Severe / Moderate Degree KK Found	10	9,03	2.139	237
MDC - 07 Hepatobiliary System and Pancreas Diseases	H41B	ERCP, Complex Therapeutic Procedures, Catastrophic / Severe CR Non-existent	3	3,97	973	245
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I75B	Shoulder, Arm, Elbow, Knee, Leg or Foot Ankle Injuries, 64 Years Old or KK Found	10	0,88	218	248
MDC - 19 Mental Health Disorders	U66Z	Eating Disorders and Obsessive-Compulsive Disorders	11	5,22	1.332	255
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I67B	Septic Arthritis, Catastrophic / Severe CC Non-existent	5	1,55	411	265
MDC - 03 ENT & Oral Diseases	D62Z	Epistaxis (Nasal Bleeding)	4	0,46	126	273
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I08A	Hip and Femur Operations, Other, Catastrophic / Severe CK Found	4	8,13	2.374	292
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I77B	Pelvic Fractures, Catastrophic / Severe CC Non-existent	22	1,38	415	301
MDC - 19 Mental Health Disorders	U63A	Affective Disorder, Major, 69 Years Old, or Catastrophic / Severe CK Found	13	4,86	1.477	304
MDC - 16 Blood and Bloodmaking Organs and Immune Diseases	Q02A	Blood and Blood-making Organs, Operating Room Operations, Other, Catastrophic / Severe CK Found	3	6,39	2.056	322
MDC - 09 Skin, Subcutaneous (Subcutaneous) Tissue and Breast Diseases	J60A	Skin Ulcers	4	2,36	762	323

MDC - 07 Hepatobiliary System and Pancreas Diseases	H42A	ERCP, Other Therapeutic Procedures, Catastrophic / Severe CK Found	3	5,03	1.633	325
MDC - 11 Kidney and Urinary Tracts (Urinary Tract) Diseases	L60A	Kidney Failure, Catastrophic CK Found	4	4,18	1.382	331
MDC - 01 Nervous System Diseases	B02A	Craniotomy, Catastrophic CK Found	5	13,53	4.628	342
MDC - 23 Factors Affecting Health and Other Types of Contacts Established by Health Services	Z60A	Rehabilitation, Catastrophic / Severe CK Found	4	5,48	1.893	345
MDC - 21 Injuries, Poisoning and Toxic Drug Effects	X04B	Injuries, Lower Extremity, Sixty Years Old, KK None	4	1,14	397	348
MDC - 04 Respiratory System Diseases	E02C	Respiratory System, Operating Room Procedures, Other, Catastrophic / Severe CC Non-existent	4	1,47	519	353
MDC - 01 Nervous System Diseases	B66B	Neoplasm, Catastrophic / Severe KK None	11	1,79	638	356
MDC - 20 Alcohol / Drug Use and Alcohol / Drug-induced Organic Mental Health Disorders	V64Z	Dependence and Use Disorders, Other Medicines	3	0,93	355	382
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I76B	Musculoskeletal (Musculoskeletal) System, Other Diseases, 69 Years Old or KK Found	4	1,07	414	387
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I78A	Femur Neck Fractures, Catastrophic / Severe CK Found	3	1,91	741	388
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I65B	Soft Tissue, Malignities, Pathological Fractures Included, Catastrophic / Severe KK	4	1,84	722	392

MDC - 01 Nervous System Diseases	B79Z	Cranial Fractures	44	0,77	321	417
MDC - 19 Mental Health Disorders	U65Z	Anxiety Disorders	77	1,11	468	421
MDC - 09 Skin, Subcutaneous (Subcutaneous) Tissue and Breast Diseases	J14Z	Breast Reconstruction, Major	5	4,59	1.957	426
MDC - 09 Skin, Subcutaneous (Subcutaneous) Tissue and Breast Diseases	J67B	Skin Diseases, Minor, in the Same Day	11	0,21	92	440
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I01Z	Joint Operations, Lower Extremity, Major, Bilateral (Bilateral), or Multiple	7	13,57	6.078	448
MDC - 06 Digestive System Diseases	G02A	Thin and Small Bowel Procedures, Major Procedures, Catastrophic CT Findings	7	7,87	3.544	450
MDC - 15 Newborn (and Other Neonates)	P67B	Newborn, Applied Weight 2499 g, Without Major Operation Theater Procedure, Accompanied by One Major Problem	20	1,96	883	451
MDC - 04 Respiratory System Diseases	E70A	Whooping Cough and Acute Bronchiolitis, KK Found	12	0,99	454	459
MDC - 03 ENT & Oral Diseases	D67A	Dental and Oral Disorders, Except Shooting and Repair	67	0,85	396	465
MDC - 19 Mental Health Disorders	U63B	Affective Disorder, Major, Under 70 Years, Catastrophic / Severe KK None	171	3,08	1.439	467
MDC - 05 Circulatory System Diseases	F68Z	Congenital Heart Disease	3	0,96	452	471
MDC - 14 Pregnancy, birth and puerperium	O60B	Birth, Vaginal Delivery, Catastrophic / Severe CC Non-existent	11	1,10	526	478
MDC - 03 ENT and Oral Diseases	D66A	Ear, Nose, Throat and Mouth, Other Diagnoses, KK Found	5	0,97	468	483
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I05Z	Joint Replacement (Joint Replacement) and Joint Restart Operations	10	6,84	3.320	485
MDC - 05 Circulatory System Diseases	F13Z	Amputation, Circulatory System Caused, Upper Extremity and Thumb	8	2,47	1.202	487

MDC - 01 Nervous System Diseases	B02C	Craniotomy, KK	94	6,50	3.185	490
MDC - 19 Mental Health Disorders	U67Z	Personality Disorders and Acute Reactions	12	1,44	712	495
MDC - 16 Blood and Blood-making Organs and Immune Diseases	Q61A	Erythrocyte (Red Blood Cell) Diseases, Catastrophic CK Found	4	2,50	1.237	495
MDC - 14 Pregnancy, birth and puerperium	O66A	Referral, Antenatal and Other Obstetric Causes	115	0,62	308	497
MDC - 21 Injuries, Poisoning and Toxic Drug Effects	X02Z	Skin grafts and microvascular tissue transfer, aimed at hand injuries	15	1,51	755	500
MDC - 07 Hepatobiliary System and Pancreas Diseases	H62A	Pancreatic Diseases, Apart from Malignancy, Catastrophic / Severe CK Found	4	2,53	1.271	502
MDC - 14 Pregnancy, birth and puerperium	O01B	Birth, Caesarean section, Severe CK Found	7	2,44	1.274	522
MDC - 11 Kidney and Urinary Tracts (Urinary Tract) Diseases	L41Z	Cystourethroscopy in the same day	24	0,34	182	536
MDC - 14 Pregnancy, birth and puerperium	O60C	Birth, Vaginal Delivery, Unilateral, Uncomplicated, Other Discomfort	98	0,91	489	537
MDC - 03 ENT & Oral Diseases	D14Z	Diagnosis and Treatment of Oral and Salivary Glands	67	0,82	447	545
MDC - 03 ENT & Oral Diseases	D10Z	Nasal Diagnosis and Treatment Procedures	102	0,94	512	545
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I64B	Osteomyelitis, KK Non-existent	6	2,35	1.298	552
MDC - 02 Eye diseases	C02Z	Diagnosis and Treatment Procedures for Eye, Enucleation and Orbit	59	1,36	754	554
MDC - 11 Kidney and Urinary Tracts (Urinary Tract) Diseases	L09C	Kidney and Urinary Tract Diseases, Other Procedures, Catastrophic / Severe KK None	19	1,42	789	556

MDC - 08 Musculoskeletal and Connective Tissue Diseases	I69C	Bone Diseases and Specific Arthropathies, Over 75 Years Old, Catastrophic / Severe KK None	32	0,80	451	563
MDC - 14 Pregnancy, birth and puerperium	O61Z	Postpartum and Post-Late, Without Operation	3	0,57	322	564
MDC - 23 Factors Affecting Health and Other Types of Contacts Established by Health Services	Z64B	Other Factors Affecting Health Status, Within the Same Day	55	0,32	182	568
MDC - 04 Respiratory System Diseases	E63Z	Sleep apnea	1872	0,35	200	571

Table 3: The highest DRGs according to the average SUT Amount / Relative Value portion of the data set

MDC_Name	DRG	DRG_Name	Number of Files	Relative Value	Average SUT Amount	Average Amount / Relative Value
MDC - 06 Digestive System Diseases	G04B	Adheyolysis, Peritoneum, 49 Years Old or Catastrophic CK Found	27	1,93	3.410	1.767
MDC - 06 Digestive System Diseases	G70B	Digestive System, Other Diagnoses, KK None	155	0,42	743	1.769
MDC - 16 Blood and Blood-making Organs and Immune Diseases	Q62Z	Coagulation Disorders	55	1,48	2.621	1.771
MDC - 09 Skin, Subcutaneous (Subcutaneous) Tissue and Breast Diseases	J12C	Lower Extremity Procedures, Ulcer / Cellulite Findings, Catastrophic KK None, Skin Graft / Flap Repair No	4	2,37	4.205	1.774
MDC - 18 Infectious and Parasitic Diseases	T61B	Infections, Postoperative (After Surgical Procedure) and Posttraumatic (Post Traumatic), 55 Years Old or Catastrophic / Severe CC	14	1,00	1.775	1.775
MDC - 21 Injuries, Poisoning and Toxic Drug Effects	X62A	Poisoning / Toxic Effects, Medicines and Other Substances, 59 Years Old or KK Found	18	0,83	1.546	1.862

MDC - 12 Male Reproductive Organs Diseases	M64Z	Male Reproductive Organs, Other Diagnoses	19	0,31	579	1.868
MDC - 01 Nervous System Diseases	B63Z	Cerebral Function Disorders, Dementia and Other Chronic Disorders	14	2,01	3.795	1.888
MDC - 12 Male Reproductive Organs Diseases	M60A	Male Reproductive Organs, Malignancy, Catastrophic / Severe CK Found	1	2,10	3.969	1.890
MDC - 06 Digestive System Diseases	G64Z	Inflammatory Bowel Disease	38	0,95	1.808	1.903
MDC - 11 Kidney and Urinary Tracts (Urinary Tract) Diseases	L42Z	ESWL For Uriner Stones	3	0,50	977	1.954
MDC - 21 Injuries, Poisoning and Toxic Drug Effects	X63B	Sequelae, Caused Treatment, Catastrophic / Severe CK None	26	0,63	1.232	1.956
MDC - 02 Eye diseases	C61Z	Eye, Neurological and Vascular Diseases	88	0,63	1.245	1.977
MDC - 18 Infectious and Parasitic Diseases	T62A	Unknown Unknown Fire (FUO), KK Found	10	1,10	2.232	2.029
MDC - 07 Hepatobiliary System and Pancreas Diseases	H60B	Cirrhosis and Alcoholic Hepatitis, Severe CK Found	7	1,83	3.717	2.031
MDC - 05 Circulatory System Diseases	F67B	Hypertension, KK None	27	0,51	1.054	2.067
MDC - 23 Factors Affecting Health and Other Types of Contacts Established by Health Services	Z01B	Operational Procedures, For Diagnoses Made With Other Contacts Established With Health Units, Catastrophic / Severe CC Non-existent	179	0,78	1.635	2.096
MDC - 09 Skin, Subcutaneous (Subcutaneous) Tissue and Breast Diseases	J07B	Breast, Non-Malignant Events, Minor Procedures	115	0,67	1.416	2.113

MDC - 16 Blood and Blood-making Organs and Immune Diseases	Q01Z	splenectomy	6	3,14	6.700	2.134
MDC - 04 Respiratory System Diseases	E73C	Pleural effusion, Catastrophic / Severe CC Non-existent	20	0,89	1.981	2.226
MDC - 21 Injuries, Poisoning and Toxic Drug Effects	X07B	Injuries, Skin Grafting Practices, Without Hand, Without Microvascular Tissue Transfer, Catastrophic / Severe KK	12	1,37	3.071	2.241
MDC - 02 Eye diseases	C15B	Eye, Glaucoma and Complex Cataract Diagnosis and Treatment Procedures	184	0,48	1.082	2.254
MDC - 21 Injuries, Poisoning and Toxic Drug Effects	X60C	Injuries, Under 65	26	0,41	926	2.259
MDC - 17 Neoplastic diseases (Hematologic & solid neoplasms)	R04A	Neoplastic Diseases, Other, Accompanied by Other Operating Room Procedures, Catastrophic / Severe CK Found	3	2,48	5.796	2.337
MDC - 10 Endocrine, Nutritional (Nutrition) and Metabolic Diseases	K62C	Metabolic Diseases, Miscellaneous, Over 75 Years Old, Catastrophic / Severe KK None	59	0,56	1.328	2.371
MDC - 05 Circulatory System Diseases	F63B	Venous thrombosis, Catastrophic / Severe CC Non-existent	6	0,70	1.686	2.408
MDC - 01 Nervous System Diseases	B60B	Paraplegia / Quadriplegia, Identified, With or Without Operating Room Procedures, Catastrophic KK None	17	2,76	6.771	2.453
MDC - 11 Kidney and Urinary Tracts (Urinary Tract) Diseases	L65B	Kidney and Urinary Traktus Signs and Findings, Catastrophic / Severe KK None	51	0,57	1.404	2.463
MDC - 03 ENT and Oral Diseases	D61Z	Equilibrium Disorder	21	0,51	1.272	2.494

MDC - 08 Musculoskeletal and Connective Tissue Diseases	I73B	Post-Implant / Post protection Maintenance, Musculoskeletal (Musculoskeletal) System, 59 Years Old or Catastrophic / Severe CK Found	8	1,09	2.799	2.568
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I61Z	Femur, Distal Fractures	6	1,12	2.990	2.669
MDC - 05 Circulatory System Diseases	F71B	Major Non-Arrhythmia and Conduction Disorders, Catastrophic / Severe CC Non-existent	7	0,63	1.749	2.776
MDC - 01 Nervous System Diseases	B70B	Stroke, Severe CK Found	14	2,26	6.432	2.846
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I14Z	Stump Revision	5	1,42	4.078	2.872
MDC - 01 Nervous System Diseases	B71A	Cranial and Peripheral Nerve Diseases, KK Found	6	3,33	9.599	2.883
MDC - 05 Circulatory System Diseases	F73B	Syncope and Collapse, Catastrophic / Severe CC Non-existent	31	0,48	1.386	2.888
MDC - 01 Nervous System Diseases	B67B	Degenerative Nervous System Diseases, 59 Years Old, Catastrophic / Severe KK None	44	1,06	3.067	2.894
MDC - 18 Infectious and Parasitic Diseases	T61A	Infections, Postoperative (Post-Surgical) and Post Traumatic (Post Traumatic), 54 Years Old or Catastrophic / Severe CK	15	1,66	4.816	2.901
MDC - 01 Nervous System Diseases	B72B	Nervous System, Infection, Except Viral Meningitis, Catastrophic / Severe KK	28	1,72	4.990	2.901
MDC - 18 Infectious and Parasitic Diseases	T01C	Infectious and Parasitic Diseases, Operating Room, KK	21	1,45	4.315	2.976
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I68A	Spinal Diseases, Non-Surgical, CK Found	9	1,20	3.607	3.006

MDC - 06 Digestive System Diseases	G04C	Adheyzolysis, Peritoneal, Under 50 Years, Catastrophic KK None	10	0,77	2.444	3.174
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I66B	Inflammatory Musculoskeletal (Musculoskeletal) Diseases, Catastrophic / Severe CC Non-existent	40	0,60	1.964	3.273
MDC - 01 Nervous System Diseases	B70D	Stroke, Dead or Transferred Within 5 Days	7	0,57	1.887	3.310
MDC - 10 Endocrine, Nutritional (Nutrition) and Metabolic Diseases	K63Z	Metabolic Disease	15	0,60	1.993	3.322
MDC - 17 Neoplastic diseases (Hematologic & solid neoplasms)	R63Z	Chemotherapy	4	0,49	1.691	3.452
MDC - 10 Endocrine, Nutritional (Nutrition) and Metabolic Diseases	K04Z	Obesity, Major Operations	42	2,15	7.706	3.584
MDC - 18 Infectious and Parasitic Diseases	S65B	HIV - Associated Diseases, Severe CK Found	3	3,60	13.109	3.641
MDC - 01 Nervous System Diseases	B80Z	Head Injuries, Other	11	0,38	1.390	3.657
MDC - 02 Eye diseases	C03Z	Eye and Retina Diagnosis and Treatment Procedures	760	0,49	1.908	3.895
MDC - 23 Factors Affecting Health and Other Types of Contacts Established by Health Services	Z60C	Rehabilitation in the Same Day	5	0,18	783	4.352
MDC - 12 Male Reproductive Organs Diseases	M60B	Male Reproductive Organs, Malignancy, Catastrophic / Severe CK Found	5	0,64	2.848	4.450

MDC - 09 Skin, Subcutaneous (Subcutaneous) Tissue and Breast Diseases	J63Z	Breast, Non-Malignant Diseases	51	0,41	1.869	4.559
MDC - 01 Nervous System Diseases	B68B	Multiple Sclerosis (MS) and Cerebellar Ataxia, KK None	104	0,44	2.013	4.576
MDC - 02 Eye diseases	C62Z	Eye, Hifema and Medical Intervention Trauma	20	0,11	511	4.644
MDC - 04 Respiratory System Diseases	E71B	Respiratory System, Neoplasm, Severe / Moderate Severe CK Found	5	1,35	8.413	6.232
MDC - 10 Endocrine, Nutritional (Nutrition) and Metabolic Diseases	K09Z	Endocrine, Nutrition (Nutritional) and Metabolic, Operating Room Procedures, Other	4	0,76	5.613	7.385
MDC - 08 Musculoskeletal and Connective Tissue Diseases	I72A	Muscle - tendon (Musculotendinous) Diseases, Original, 79 Years Old or Catastrophic / Severe CK Found	3	1,68	13.649	8.125
MDC - 01 Nervous System Diseases	B71B	Cranial and Peripheral Nerve Diseases, KK none	54	0,80	8.174	10.217
MDC - 01 Nervous System Diseases	B67C	Degenerative Nervous System Diseases, 60 Years Old, Catastrophic / Severe KK None	45	0,58	6.551	11.294

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