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Refund Methods and Diagnosis-Related Groups Made to Health Institutions in Turkey

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ABSTRACT

There are many difficulties in applying repayment methods. Reimbursement methods made to healthcare service providers determine an important quality in the provision of health services. The types of reimbursement methods made significantly affect the care services that patients should receive and the expenditures made. Repayment methods, the use of quality services that are tried to be put forward with the scarce resources available, act as a bridge between service providers and paying institutions. Because of this benefit, the use of Diagnosis-Related Groups and other payment methods, which are tried to be widespread, in health institutions, is tried to be made effective. In particular, the study focuses on the reimbursement methods made to health institutions in Turkey. In addition, the formation of Diagnosis-Related Groups in Turkey and the reimbursement methods based on Diagnosis-Related Groups in Turkey were mentioned. At the end of the study, it was seen how the repayments attempted to be made affect the distribution of financial resources among health institutions and how important it's in dealing with the payment methods of Diagnosis-Related Groups was obtained. It's thought that the study carried out will fill the gap in the literature and lead the future researches.

Keywords: *Reimbursement Methods, Diagnosis-Related Groups, Healthcare, Health Institutions*

1. INTRODUCTION

Due to the nature of health services, it is not known when individuals will need health services. In healthcare, needs and costs cannot be predicted. This process has created an obligation for service providers and service recipients, as well as third party payers. Third-party payers transfer funds to service providers by providing financing to citizens within the framework of the rules. Thus, they bring a solution to the issue of costs that citizens cannot afford fairly (Işıkçelik et al., 2019: 2).

Health institutions must provide uninterrupted service in order to have access to health services whenever needed. Financial sustainability and reimbursement method is important for continuous health service delivery. Third-party payers consist of repayment methods, healthcare institutions, healthcare professionals, patients / citizens, service providers and individuals, during the provision of resources to service providers in the process of financing the healthcare service (Işıkçelik et al., 2019:2).

Reimbursement methods made to healthcare providers are a financial obligation in the health service process, and it is a system that includes the opportunity to evaluate in terms of health economics and health financing. Making payments to health service providers in the context of income generation, fund pooling and service provision, which are considered as functions of health financing, increase the importance of reimbursement methods in health services. Healthcare providers are organizations that provide diagnosis and treatment services for preventive, rehabilitation or direct treatment purposes. Service providers are “health institutions that provide primary, secondary, tertiary and fourth level healthcare services and private healthcare services” (Ministry of Health, 2019: 10). Service providers consist of institutionalized service providers such as physicians and hospitals.

Payment mechanisms are the system that determines the reimbursement of the health service fee offered to individual or institutional provided by the health service providers, such as the government, user or insurance, by financial factors (Acar, 2019).

The reimbursement methods to be made to health institutions and health professionals consist of the following (Top and Tarcan, 2007):

- Health care providers (public and private institutions),
- Health service professional (physicians, nurses, other healthcare professionals),

- Health service recipients (patients and citizens),
- Repayment institutions (social security institution, insurance institutions)
- And form relationships regulated by the state (Demirel, 2020).

In the formulation of health policies in our country, shedding light on the future of health with the outputs of past periods undoubtedly increases efficiency and appropriateness. At this point, “Diagnosis-Related Groups (DRG)” activities are among the activities carried out in line with the purposes of quality and sustainability in the service delivery of the Ministry of Health. Although DRG are applied worldwide with different perspectives, they encourage service providers to provide quality health services with an understanding of diagnosis-based and optimum treatment cost in the treatment of diseases (Ministry of Health, 2014).

DRG studies distribute health service data to health service providers in an equitable manner within the framework of a specific system and analysis activity. In addition, it is an important data source in the planning of personnel and resources, as it is a payment system and data at national and local level. In our country, DRG studies, which started with the Hacettepe University Research Project (HUAP), have been actively carried out by the Ministry of Health since 2009 and the foundations of the institutional structure have been laid. Along with these foundations, the software infrastructure of the DRG system was prepared, and the manpower capacity was created by training the clinical coders required to enter data into the DRG system. The reason for this is to form the basis of DRG, which is a method of reimbursement in health services (Kurşun and Yümsel, 2017).

2. REFUND METHODS IN HEALTHCARE SERVICES

Healthcare financiers and healthcare providers have to fulfil the service delivery used by individuals. Payment mechanisms refer to the relationship between healthcare financing and service providers. Payment mechanisms have an important place between providing services and equitable distribution (Akyürek, 2012:2). Repayment methods are considered prospectively and retrospectively. In prospectively payment method; payment is collected before the healthcare service takes place. Retrospectively payment method; are collected after the health service is provided.

Reimbursement methods in health services consist of “payment unit, time orientation and financial risk” factors. Reimbursement methods used to reimburse healthcare providers (Işıkçelik et al., 2019:2):

- Line-Item Budget Method
- Global Budget Methods
- Per Day Payment Method
- Per Service Payment Method
- Per Capita Payment Method
- Per Case Payment Method
- Value-Based Payment Method, reimbursement methods made to health institutions were discussed in detail.

2.1. Line-Item Budget Method

The line-item budget method is the allocation of resources to health service providers for special expenditure items (personnel, medicine and consumables, etc.). The budget and inflation data of the previous year are considered in the line-item budget method. It ensures the effective use of limited resources in health institutions.

No need for a complex and time-saving data collection system ensures low management costs (Işıkçelik et al., 2019:2). Line-item budgets are one of the payment methods used in low and middle-income countries (İleri and Arık, 2016).

2.2. Global Budget Method

Global Budget can be expressed as the quality and limit of the services provided (Acar, 2019). With this method, the volume of healthcare services and a total price is determined (Işıkçelik et al., 2019: 2). The Global Budget application does not provide additional payments for high, complex and expensive services. In this method, exceeding the ceiling is the most talked about issue. In the method determined for public hospitals, the monitoring process cannot exceed the ceiling, and if the specified level is exceeded, the payment within the budget is made and the cancellation process is waived for the remaining portion (Özkan and Ağırbaş, 2016). In Turkey, for the supervision of the Health Transformation Program by placing limits payments to health care spending in 2006 was adopted Global Budget Method (Işıkçelik et al. 2019:2). Turkey’s

Ministry of Health by the health care financing in 2006 to be used “Global Budget Method” has been implemented. The Ministry of Health in Turkey since 2006, also since 2015 was put into practice in most university hospitals. The Global Budget Method has positive and negative aspects. Positive sides; to discipline hospital expenses and to control hospital expenses. Negative sides; is that it does not encourage the provision of the maximum level of healthcare services with a fixed fee during the year (Yiğit, 2016).

2.3. Per Day Payment Method

Per day payment or the daily rate is a prospectively restricted payment type (Özkan and Ağırbaş, 2016). For per day payment method, third-party paying healthcare providers make the specified fixed payment per day for each individual receiving the service. Payments are made mainly to healthcare providers who provide inpatient treatment services. The payment is determined to the service providers by using the historical data and the payment amount is obtained by multiplying the determined rate per day and the days spent in the hospital. In the absence of historical data, healthcare financing and service providers include “length of stay, severity of illness, service volumes and illness status” in the rate of payment per day (Akyürek, 2012). For example, the daily cost for inpatients is calculated by dividing the total costs of inpatient treatment institutions according to the population group within a certain period of time (Acar, 2019).

The biggest criticism of the prospectively payment method is that service providers try to inflate the number of inpatients admitted to the hospital and the number of days spent (Özkan and Ağırbaş, 2016).

2.4. Per Service Payment Method

The physician receives payment for the diagnosis and treatment processes of the individual who requests a health service application. The service provider is paid according to the number of services and services (Karacaoğlan, 2010). In healthcare institutions, in the per service payment method, each payment item is allocated retrospectively. There is a price situation for each service offered by the health institution, and pricing is invoices issued backwards from health services. The relevant institution that will make the payment for the repayment is researched, and the payment is made with the related deduction (Özkan and Ağırbaş, 2016). Healthcare Implementation Communique, Medicine Practices Database and Public Health Services Price

Tariff used in Turkey can be given as examples. The lower and upper limits are determined in pricing for the services and goods used in the provision of healthcare services (Işıklı et al., 2019: 2).

The method of payment is as follows: Cash payment and service fee is a repayment system made by third party payers after the service is completed (Aydemir and Ağırbaş, 2017). The per service payment method is a method widely used in developing countries for private hospitals, health institutions, and physicians providing individual services (Aydemir and Ağırbaş, 2017). From the point of view of health insurance institutions, the most prominent disadvantage is uncertainty. The cost of healthcare service provided by service providers is not known, and it is not possible to know which health service will be provided to patients in advance (Akyürek, 2012: 2).

2.5. Per Capita Payment Method

The per capita payment method takes place in healthcare services by third-party payers to service providers over a period of time. It is a fixed fee payment per insured person. The service provided to the patient has no effect on the payment method (Akyürek, 2012: 2). The per capita payment method facilitates the cost of healthcare services provided and its control by healthcare financing (Özkan and Ağırbaş, 2016).

In the per capita payment method, the risk pooling system and persons assigned to the service provider may be not used the health services provided in the specified period. From another point of view, in cases where the cost of inpatients is more than necessary, it may exceed the amount of payment per person (Aydemir and Ağırbaş, 2017).

The positive aspects of this payment method are that there is no uncertainty for the third-party payer and there is a guarantee of a net customer base for the service provider. While there is information about the costs of healthcare services, the status of the service patients will receive and the costs they will bear is uncertain (Akyürek, 2012:2). There are no parameters that the service provider may affect, which may lead to wastefulness and unnecessary expenses (Acar, 2019).

2.6. Per Case Payment Method

The per case payment method is the prospectively method for each case. A fixed amount is paid according to the type of case treated (patients with a specific condition or treatment based on a disease). Third party service providers are paid per case instead of per day or per service (Akyürek, 2012: 2). Healthcare providers use payment systems and global budget types (Işıkçelik et al., 2019: 2). It is an incentive realized by determining the pay per case fees according to the density of different health service providers (such as hospitals) and controlling the efficiency, efficiency and unnecessary service status of the inputs for the providers (Işıkçelik et al., 2019: 2).

For payment, the historical data of patients who receive each service depending on a disease are used. The DRG application, which has been used most recently, classifies patients homogeneously. Therefore, patients in the same classification are evaluated in terms of diagnosis, treatment and length of stay. The service status to be provided varies according to the high or low level of treatment and service (Akyürek, 2012: 2).

The per case payment method is the incentive process of increasing the number of cases as well as reducing each input addressed. Service providers focus more on resource allocation than on the patient population being treated. Negatively, unnecessary hospitalization and inflation of bills are in question (Işıkçelik et al., 2019: 2).

2.7. Value-Based Payment Method

Value-based payment method in health came to the fore with the pricing and reimbursement process of health services in the 1980s (Durur, 2020: 153-186). The value-based payment method, which bases the payment method on performance, is a method that is evaluated in terms of the quality, transparency and cost of health care (Işıkçelik et al., 2019: 2). There is no specific pattern about the variability and grouping status of this payment status (Durur, 2020).

In the value-based payment method; Factors such as deaths, complications, infection, patient safety, costs, effectiveness, efficiency and the treatment process of individuals receiving healthcare services in the health institution (hospital) are evaluated. Disadvantageous situations in the healthcare process for patients are avoided. With this method, it is aimed to ensure that individuals leave health institutions satisfied with a low cost by curing patients and avoiding chronic diseases (Işıkçelik et al., 2019: 2).

3. DIAGNOSIS-RELATED GROUPS

The reimbursement system, based on DRG, deals with situations in different fields such as clinical factors, quality measures, effectiveness, cost, financial conditions (Çağlar and Çil Koçyiğit, 2020). “It is a method that involves grouping diseases using clinical and cost data and assigning similar diseases to similar groups.” (Ministry of Health, 2011). The scarce resources are grouping the clinical and cost data of patients according to the type and severity of the case and classifying them among similar diseases (Işıkçelik et al., 2019: 2).

Prospectively, the reimbursement method based on DRG provides incentives to increase the number of patients treated and to reduce the number of services per case. The DRGs may be less than the differences in patient groups and the variety of services provided and the condition of the cases. As a result, hospitals may avoid more complex cases (Işıkçelik et al., 2019: 2).

3.1. History of Diagnosis-Related Groups

DRGs were first developed by Robert Fetter and his friends (Işıkçelik et al., 2019: 2) in the 1970s for the quality control of healthcare services in the United States, and they were started to use as reimbursement methods in New Jersey in the 1980s (Ministry of Health, 2011). Subsequently, it has been used in countries such as Australia, Canada, Ireland, Singapore, New Zealand, Thailand, Korea, China, Malaysia, Taiwan, Romania, Costa Rica, Czech Republic, Hungary, Slovenia and Bulgaria under the leadership of the United States. In Europe; it has been implemented in Austria, Denmark, Belgium, Netherlands, England, France, Germany, Finland, Spain, Italy, Portugal, Sweden, Switzerland, Wales (Işıkçelik et al., 2019: 2). Within the scope of DRG, payments were started to be made to hospitals in the Medical Care Insurance Program in 1983 and three factors were focused on at the international level in order to increase the efficiency of DRG-based payment systems (Özkan and Ağırbaş, 2016):

- Considering the workload and financing of hospital payment-based health services transparently.
- The criteria for payments are the nature of the hospital and the case mix index.
- In the DRG payment method, there is no competition.

The main purpose of the formation of DRG; it is the production of comparable data with similar output and case types. As an inpatient classification method (DRG), it enables the evaluation of the treatment resources spent on equivalent cases by grouping them according to costs and

patient types, diagnoses and procedures. The spent treatment resources are evaluated in the perspective of relative value and coefficient (Ministry of Health, 2011).

Making a comparison with the differences between hospitals, DRG shares statistical data of inpatients from the national database, based on hospitals across the country. It helps managerial effectiveness and patient budgeting and grouping are among its advantageous situations. Among its disadvantages; It may be on the carpet for physicians to oppose the DRG reimbursement method in terms of income and status, and to act biased in the clinic and care expenses of health institutions considered within the scope of DRG. Compromising on quality, severity of illness and duration of stay in the hospital, providing health services to a milder patient population instead of patients with severe and urgent criteria are among its negative aspects (Aydemir and Ağırbaş, 2017).

The DRG groups the diseases according to the main diagnosis and then the procedures. The treatment costs spent are expressed as relative value rather than monetary value. Basic concepts related to DRG Main diagnosis, Additional diagnosis, Procedures, Relative Value and Case Mix Index (CMI) are discussed as follows:

- Main diagnosis: It is the diagnosis revealed as the main cause of the patient's care episode in the hospital (or the state of being in a health institution) at the end of the study (National Health Information Committee, 2003). By analysing the findings at the end of the study, the analysed findings may include the patient's epicrisis, mental state analysis, specialist doctor consultations, physical examination, diagnostic tests or procedures, surgery, pathology and radiological data.
- Additional diagnosis: It is the complaint or situation that occurs during the period of the patient's care episode and the health institution, together with the main diagnosis of the individual. In this, the duration of the patient's stay is effective.
- Procedures: Covers all surgical, medical ACHI, ancillary healthcare services and dental procedures. The ACHI structure is classified according to the anatomical region, and the coding structure consists of a numerical system. The first five consecutive digits (12345) give information about the general characteristics and numbers such as 6 and 7 give the details of the transaction (Ministry of Health, 2011; Ministry of Health, 2014).

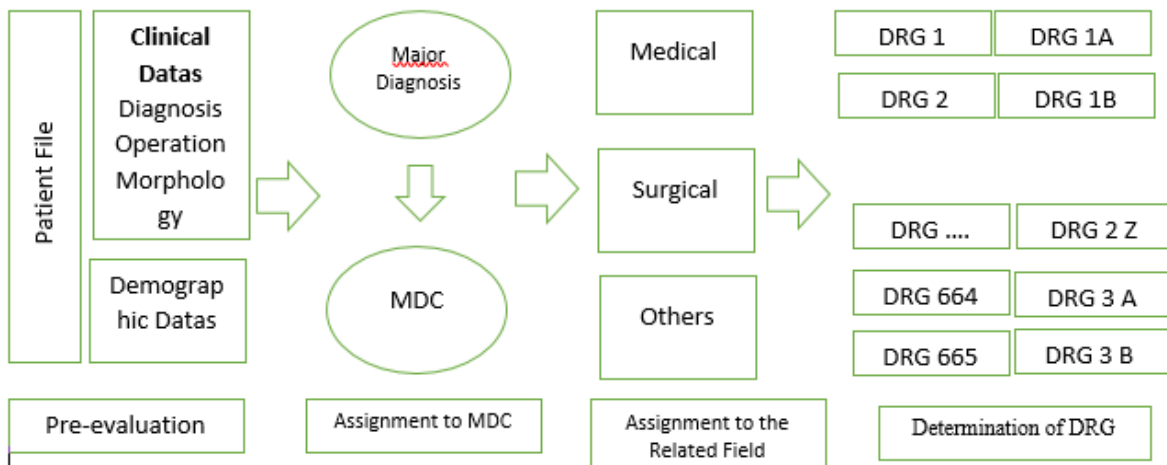
The advantages of DRG over other payment types are as follows (Aydemir and Ağırbaş, 2017); the severity of the disease, surgical patients and other cases are essential to group all inpatients, to compare and measure hospitals through the case mix index.

3.2. Formation of Diagnosis-Related Groups

Every patient is different. The diagnosis and procedures of each patient (ICD10-AM) differ from their own clinical diagnosis, risk factor, and personal and family history, and patients with similar conditions are divided into groups. Diagnosis and procedures of diseases are analysed by dividing them into parameters such as age, gender, type of discharge, length of stay, length of stay in intensive care unit, and complication of the disease, and patient-specific DRG is created by dividing the patients into groups. The process of DRG formation (Figure 1); preliminary evaluation (patient data, files, clinical and demographic data are examined), major diagnosis class (major diagnosis class is assigned after the pre-evaluation) and main diagnosis are determined, field assignment (surgical, internal and other field assignments are performed), determination of DRG is carried out (Ministry of Health, 2014).

The purpose of DRG; to distribute limited resources fairly according to the types and severity of cases, to promote hospital efficiency and effectiveness, and to create systematic, meaningful clinical data. The DRG is not just focused on the amount of resources. In the DRG perspective, the complexity of the case mix in the hospital means the more resource allocation of the healthcare facility and the treatment of the patient who needs more resources (Özkan and Ağırbaş, 2016).

Figure 1: DRG Formation Process



Source: Ministry of Health, 2014

Pre-evaluation phase; the patient file constitutes the first step and basic structure of the coding by examining the demographic and clinical information of the patient in detail. It can also be referred to as the clinical coding step and should be paid attention by the clinical coder. In the major diagnosis class (MDC), the codes determined in the pre-evaluation are transferred to the data entry program. It consists of subtitles as the main diagnosis and major diagnosis class. The main diagnosis is the diagnosis of the patient made during the hospitalization period. Major diagnostic class consists of 25 different classifications of MDC suitable for the main diagnosis affecting the disease and health status. In the field assignment process, assignment takes place according to the main diagnosis and additional diagnoses. In DRG coding, it consists of three assignments: internal, surgical and other assignments. In the last stage of the DRGs, the main diagnosis and additional diagnoses are assigned to the DRG groups of relevant conditions in the algorithm (Aydemir and Ağırbaş, 2017).

As shown in Table 1, DRG studies in our country started in 2005 as a sub-project of HUAP. It was carried out by our Ministry in 2009 under the Branch Directorate of DRG. In 2012, activities continued within the Department of Diagnosis Related Groups under the General Directorate of Health Services.

Table 1: Ministry of Health DRG Studies Process

2004 – 2006 (HUAP)	7 Hospital
2006 – 2008 (HUAP)	48 Hospital
2009 Ministry of Health	DRG Branch Office was established. 50 Hospital
2010	260 Hospital
2011	550 Hospital
2012	DRG Head of Department was established.
2013 - 2014	523 Hospital Private and universities were included.

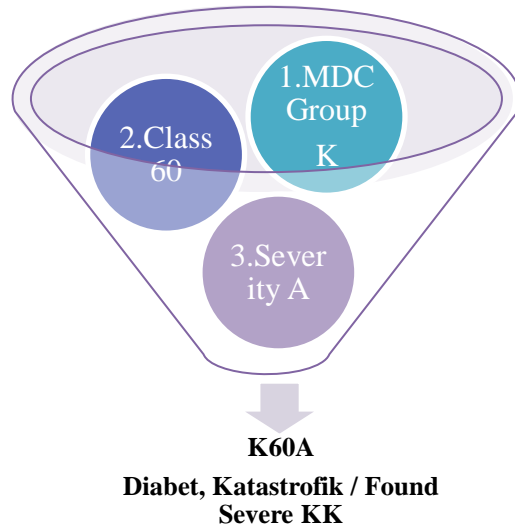
Source: Ministry of Health, 2014

In the studies, considering the Australian example, ICD10-AM (International Classification of Diseases, Australian Modification) 4th Update and AR-DRG (Australian Refined Diagnosis Related Groups: The algorithm that determines the groups) 5.1 version was used as the DRG algorithm. Since April 2014, licences for ICD10-AM (7.0) and AR-DRG (6.0) versions have been obtained. Taking to license of ICD 10-AM (7.0) and AR-DRG (6.0) versions had been realized since April 2014.

Payments were made on the basis of the DRG system for inpatients, BBaG (Branch Based Outpatient Grouping) for outpatients, and IBAG (Procedure Based Outpatient Groups) for outpatients. DRG creates land support system, Web service, Web management and clinical coder interfaces (Ministry of Health, 2011).

DRG-based payment system in Turkey started to be paid on December 1, 2010 in the November period DRG and BBaG system of 50 pilot hospitals. 206 public hospitals in provincial centers have been included in the system and since January 2011, 555 public hospitals were included in all districts, and payments were made over DRG. The global budget payment based on DRG was suspended in 2013 and the global budget payment continued in January 2015, and the rate of payment was increased in 2016. As of August 2016, the payment based on DRG has been removed and the statistical data collection process has been started. Ruling by Decree Law No. 694 dated 15.08.2017 in Turkey Public Hospitals Authority closed the ministry organizational structure has been changed. A Department of Diagnosis Related Groups and Social Security affiliated to the Ministry's General Directorate of Management Services was established. Subsequently, the expression of DRG was removed and activities continued within the Social Security Department. Under the structure of the Social Security Institution, it was aimed to continue the studies on the DRG process (Işıkçelik et al., 2019:2).

Figure 2: Example of DRG Code Structure



Source: Işıkçelik et al., 2019:2

In Figure 2, the coding example of the DRG structure is discussed. As can be seen in the Figure 2, this part, which consists of a letter in the first part, represents the MDC group of DRG. Second part; It refers to the belonging area between 01 - 99. (Between 01 - 39 refers to surgical medical DRG.) Third part; reflects the degree of resource use and also indicates that the letters change from less to more (Işıkçelik et al., 2019:2).

3.3. Relative Value and Case Mixed Index

Relative value is the ratio of the average cost of a DRG to the average cost of all DRGs. Groups whose care and treatment require a lot of resources have high relative value costs. The relative values vary according to the high resource consumption, the severity of the case, the equipment used in the treatment process, the medicine, the type and intensity of the health service provided in the care and treatment process, and the relative value payment varies according to the situation of the case (Özkan and Ağırbaş, 2016). Cost data are important in understanding relative values (Aydemir and Ağırbaş, 2017).

$$\text{Relative Value} = \frac{\text{Average cost of a DRG}}{\text{Average cost of all DRGs}} \quad (\text{Equation 1})$$

Case mix is defined as assigning similar diseases to similar groups by grouping patients using clinical and patient data, taking into account the procedures of patients who have been in the hospital for a certain period. Different hospitals are compared in the case mix index. If a hospital's mixed case index is 1, it is understood that the hospital looks at the average cases, if it is less than 1, the cases looked at are simple and cheap, and if it is greater than 1, it looks at expensive cases.

CMI is calculated by multiplying the number of patients in the DRG with the relative values of the relevant DRG values and dividing it by the total number of cases in the hospital. It is used (Equation 2) in CMI calculation (Özkan and Ağırbaş, 2017).

$$\text{Hospital Case Mixed Index} = \frac{\text{DRG Relative Value} \times \text{Number of Cases}}{\text{Hospital Total Number of Cases}} \quad (\text{Equation 2})$$

4. RESULTS

Payments are made according to different reimbursement methods in return for service provision made to health institutions. Payment methods according to countries vary depending on factors such as economic, political and cultural factors, and more than one payment method can be used. The DRG payment method, is more preferred by health institutions and organizations due to its prospectively repayment method structure, as it is advantageous and easy to process.

In health policies, the DRG payment method, case mix index and relative value are considered together and the service delivery of the health institutions, the density of the cases, the complexity of the cases are more or less parallel to the cases with the treatment services provided and the costs. In healthcare policies, importance is attached to DRG activities, and it is thought that they will gain advantage with equitable and efficient activities.

It will be advantageous to use the DRG method as well as the DRG request, where balanced repayment will be provided to health institutions. It is important to keep the data correct in the payment system process of DRG, which has the repayment system. In the cost accounting system, relevant DRG units should be established in public and private health institutions. Including training in the clinical coding system and the training process at the relevant staff and

universities provides a healthy reimbursement process. Turkey's health system and make the appropriate DRG payment units and infrastructure created, should be developed. In addition to inpatient data, the DRG data should also be included in the payment of outpatient data. Reimbursement coefficient regulation should be made by taking into account factors such as step classification, size, number and service area of healthcare institutions.

In terms of classification of hospitals, education and research hospitals with more complicated cases should look at high-cost cases, and a fair repayment should be made by considering the conditions of 3rd level service providers with high costs with a qualified team in the hospital.

It is one of the DRG reimbursement systems and a good classification method. Turkey's provinces, districts, regions are collected data on inpatient portfolio up to. Turkey's top service providers at the point end in the corner of the DRG algorithm structure and data collected from this work is important for future health policies. The importance of the DRG units should be explained to hospital managers by supporting them. The DRG infrastructure process established in public institutions should also be supported and encouraged to institutions providing private health services. With the DRG payment system, it is thought that there will be a fair distribution to the service providers by the Social Security Institution.

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