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**DRG IMPLEMENTATION  
IN SLOVENIA –  
LESSONS LEARNED**

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*DRG Implementation in Slovenia – Lessons Learned*

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**DRG IMPLEMENTATION IN SLOVENIA – LESSONS LEARNED**

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## **Abstract**

Till 2003 the reimbursement system of inpatient health care in Slovenia was based on prospective program planning while at the same time taking into account the limited budget and the number of inpatient cases. In 2003 the reimbursement system changed. Slovenia implemented the application of diagnoses related groups (DRG) to the funding of acute inpatient care. After 2003 the reimbursement model was upgraded in a way which gives Health Insurance Institute of Slovenia (HIIS) a chance and also obligation to act as active and strategic purchaser. The DRG-based payment model was introduced in full on April 1<sup>st</sup>, 2004. In the same year a separate budget was introduced for the payment of non-acute hospital care and tertiary services. For the non-acute hospital care which is paid on the basis of hospital care days the patients are normally admitted to non-acute or tertiary care after being discharged from acute care or when they need further care, rehabilitation, nursing or palliative care. Tertiary services paid on the basis of providers' reports on accomplished tasks include educational programs, trainings for special skills, field of research and development, and proficiency and severity of services provided. Since 2005 the classification of DRGs has contained 653 DRGs. The consequences of introduction of DRG payment system are numerous. In the period between 2003-2008 the hospitalization rate in acute care increased by 12,6% (with a 1,66% average yearly growth), which was achieved with improved cost efficiency by further reducing the average length of stay and introducing appropriate organizational changes at the providers' level. Due to long-term positive financial consequences of the model of acute hospital on the basis of DRGs in 2005 the Ministry of Health proposal to increase the volume of acute inpatient care for 2% without additional financial resources was accepted at the partners' level. The number of waiting patients decreased for 31% from 2003 till 2008. In the same period the average length declined by 1.22 days or 18.5% (18,9 mio EUR) due to improved cost efficiency and implementation of non-acute inpatient care. The average number of diagnoses per case increased in year 2005 by 0.64 diagnoses or by 29,9% and 6,82 procedures compared with year 2003.

**JEL classification:** A10, I18, I10, I11

**Keywords:** Diagnosis related groups DRG, average length of stay, payment mechanism, acute hospital care, allocation of funds, hospitalization rate, non-acute care

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## **1. Executive summary**

Till 2003 the reimbursement system of inpatient health care in Slovenia was based on prospective program planning while at the same time taking into account the limited budget and the number of inpatient cases. In 2003 the reimbursement system changed. Slovenia implemented the application of diagnoses related groups (DRG) to the funding of acute inpatient care. After 2003 the reimbursement model was upgraded in a way which gives Health Insurance Institute of Slovenia (HIIS) a chance and also obligation to act as active and strategic purchaser.

## **2. Introduction.**

A payment method is the way in which money is distributed from a source of funds to the health institution (or individual provider) providing health care services. The whole point of provider payment systems is to change behavior. A good model of funding should improve efficiency and costs containment, health status and outcomes, equity and access, safety and quality, promotes use of clinical guidelines and pathways, increase patients satisfaction and avoid perverse incentives. The DRG system is an ongoing process and to ensure the sustainability of the system it requires update of costing, continuous education, informatization support, supervision and quality control.

The process of DRG implementation should be introduced gradually based on prepared and publicly discussed long term strategy and should follow an action plan with clear goals and objectives, activities and tasks. The Government should take the role of the coordinator, payers and providers must be included as partners. The dynamics of introducing changes should be adapted according to the preparedness of the system (providers, payers) for the purposes of introducing changes (especially positive incentives as well as measures to prevent negative effects).

### **3. Slovenian health identity card.**

Slovenia has been EU member since 2004. The area of 20 000 km<sup>2</sup> was populated by 2 057 220 inhabitants in 2011. In the same year GDP p.c. reached 17 361 EUR, total health expenditure amounted to 9,06% GDP (3,241 billion EUR). The share of public expenditure is 6,4% GDP (70,7%), mainly covered by compulsory health insurance (CHI) (5,84% GDP or 64,7%), the rest by the state and local budgets (0,33% GDP or 4,6%). Since 1992 HIIS is the single provider of CHI and 98% of citizens are entitled to CHI benefits. These consist of health services (71%), drugs (17%), cash benefits (9,5%). The private sources represent 2,65% GDP (29,3%) and consist of complementary health insurance (1,21% GDP or 13,3%) and out-of-pocket payments (1,17% GDP or 11,7%). In 1992 the complementary insurance (5 - 90%) for services (out- and in-patient, pharmaceuticals) was introduced. In 1996 94% citizens were insured in complementary insurance. In 2009 per capita health expenditures were 2.579 PPP US\$ (1.893 PPP US\$ public). Average life expectancy at birth was 75,4 years for male and 82,3 years for female. The main disease burden are neuro psychiatric disorders (26%), cardiovascular diseases (17%) and malignant neoplasm's (16%), the main causes of death are cardiovascular diseases (41%), malignant neoplasm's (26%) and injuries (8%) (1).

### **4. Health care system reimbursement.**

The health insurance system in Slovenia is based on Bismarck social insurance model. The sole structural changes were implemented through legislation in 1992. A mixed model was introduced in the health care financing and in the delivery of health care services. Compulsory and voluntary health insurance were introduced, investments are covered by the government in hospitals and clinics and local communities in public health centers. The choice of personal physician, management from macro to micro level and partnership negotiation and contracting process were the main structural reforms in the delivery of health care services. The 1992 Health Care and Health Insurance Act formed the legal basis for the current system and laid the foundations for the establishment of a centralized compulsory health insurance (CHI) system, administered by the HIIS. By the act, the HIIS is the exclusive provider of CHI and also purchaser of health services provided within public health care network. HIIS pays the share of a service's price covered from CHI. The difference between total price and CHI coverage is covered by insurance companies which

provide voluntary complementary health insurance. Purchasers are either non-profit public insurance company, mutual non-profit insurance company or for-profit private insurance company. Voluntary uninsured citizens have to cover the difference to total price out of pocket. The role of the Ministry of Health (MoH) in Slovenia in social insurance model is above all making health policy decision and supervision of the health care system. MoH does not perform purchasing function, however MoH can cooperate in establishing vision of purchasing function on national level and in creating conditions for strategic purchasing carried out by HIIS. Guidelines for HIIS's strategic purchasing were based on the next variables: planned and realized program of acute inpatient care providers, citizens' needs measured by waiting times and realized procedures, capacities of providers and available financial resources (2).

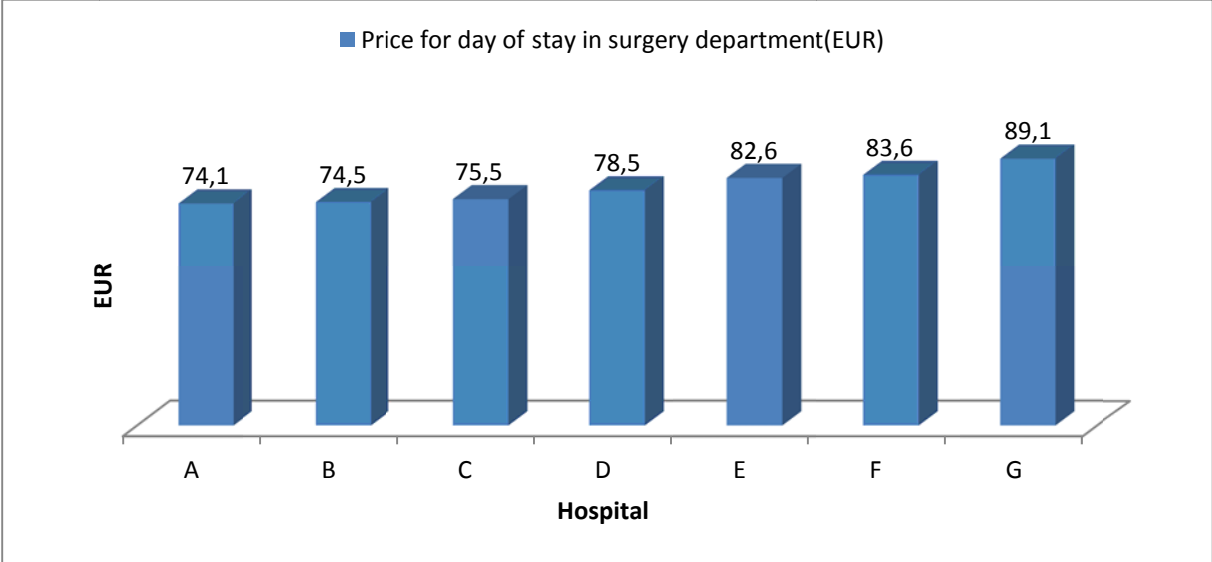
#### **5. Reasons for introducing DRG in Slovenia.**

Till 2000 inpatient hospital services were paid by the number of prospectively contracted bed-days. In 2000 the payment of inpatient hospital services in acute care changed to the case-mix system. Per case payment model represented a shift to payment by completed inpatient episodes as a unit of production for which payment was made. The hospitals were stimulated to reduce the lengths of stay (LoS) with the price of a case remained unchanged irrespectively of the length of hospitalization. Except for the incentive for reducing the LoS which undoubtedly reduced the costs, this model kept most of the weaknesses of the previous model. It did not differentiate among cases due to their severity as there were only ten different price categories. This enabled manipulation in several ways: less severe cases were admitted, administrative increase in the number of cases by interrupted hospitalization and readmission and transfer of severe patients to tertiary establishments and thus increase in administrative number of cases was administered. Per case payment was not beneficial enough as an incentive for more efficient ways of care (same-day care, same-day surgery, and home care). As there was not enough appreciation for same-day care, the hospitals decided to hospitalize the patients instead of providing them with outpatient care, as hospitalized patient was more profitable (3).



An important factor that led to the introduction of the new payment model for inpatient acute care on the basis of DRG were the unavoidable evident deficiencies in the payment model of inpatient acute care on the basis of cases. Per case payment model included an extremely narrowly defined classification of services (10 different services that referred to the so-called average case types according to specific services, for example: average case type for internal medicine, surgery...), for which prices differed from provider to provider. The differences between the highest and lowest price per case of the same specialty between different hospitals in period 2000 till 2002 went even beyond 20% (Figure 1).

Figure 1: Prices for day stay in regional hospital at the surgery departments in EUR in 2001.



It was not possible to speak of HIIS' execution of its purchasing function in its proper sense as a purchaser and payer of services since the differences in the prices of services among individual providers from the point of view of the demanding health deliveries were not possible to reason. HIIS did not make use of the data that would eventually argue the differences in the content of care on the basis of individual providers and thus in the differences in the prices of services. Aside from this the planned volume of services was only defined on the basis of ten basic deliveries, which proved that in certain cases they were not specific enough (from the point of view of purchasing of clearly defined final services and not only a group of services), or in some cases they were even too detailed. In the case of defining an additional service for a specifically defined case type, this expansion got lost within the entire planned (now higher) volume of the program of a specific service (3).

The above-mentioned model required a more specific classification of health care services which then served also for a more appropriate planning not only on the cumulative level but according to specific services.

The most important reasons for implementing DRGs were upgrading monitoring and measuring of hospital activity according to more specific and wider classification of services, acquiring health statistics and implementation of a more transparent funding system based on wider than previous classification of hospital health care services and on equal prices of these services for all hospitals. By introducing DRG we expected to increase cost efficiency, gain equity for providers and competition and improve management, benchmarking and planning. The main goal was that the money would follow the needs of the citizen and patients.

## **6. DRG implementation process.**

The hospital payment methods move towards per case payment began on a transitional basis in 2000. The per case incentives encouraged hospitals to reduce the length of stay (LoS) because the price of a case remained unchanged irrespectively of the period of hospitalization, and this led to a degree of cost containment. Reliable data became available for the episodes of care, and this was useful for various planning purposes. However, there were some basic problems. For example, the classification of episodes was elementary (comprising little more than categories of specialty). There was no valid indicator of care needs, and this may have encouraged admission of less complicated case types. There was no adequate basis for monitoring episode splitting (such as discharging a patient and subsequently re-admitting or transferring him or her to another hospital for the continuation of treatment of the same health problem). Another important weakness was a lack of clarity regarding the boundaries between outpatient, same-day, and inpatient overnight stay episodes. There were financial incentives to provide inpatient care and overnight stay rather than same-day care. In Slovenia in 2002, however, 40% of acute inpatients had inpatient stays of three days or less (and this proportion increased as a consequence of per case payment) but only 10% of cases were same-day (4). It was evident that Slovenian hospitals had the capability to increase same-day care, but inappropriate payment incentives discouraged them from doing so.

With the intention to abolish the weaknesses of the per case model, the DRG payment model was introduced in 2003. Research began in 2001 with the intention of implementing a more sophisticated payment model for inpatient care. In July 2002 a workshop was organized by Health Sector Management Project (HSMP) about the plan to introduce DRGs to Slovenia where various experts were invited to express their view on three options of DRG classification in terms of their suitability for use in Slovenia. Representatives of each of the main clinical specialties in Slovenia were invited to the workshop, more than 2/3 of invited attend the workshop. There was a strong consensus from the attendees for the use of Australian DRG classification as a starting point for the development of a Slovenian equivalent, and for initial analyses and modeling of ideas for change of funding methods. Important steps included appraisal of optional variants of the DRG classification with the assistance of clinicians from most hospitals and specialties, and the development of methods of estimating the relative costs of DRGs. In common with several other countries including Germany, Romania, Ireland, and Turkey, the Australian variant (AR-DRG) was selected mainly because of its greater clinical sophistication. In order to support correct implementation, work began to prepare for a change from the ICD-10 diagnosis classification (which had been little-changed since 1993) to the up-to-date and clinically more sophisticated ICD-10-AM classification. Even more important, preparations began for a change from a Slovenian classification of procedures to the procedure part of ICD-10-AM (5). In 2004 the change was done. This meant an increase in the number of procedure classes from around 600 to over 6000. Several data definitions were modified including the definition of the inpatient episode, and training programs instituted with regard to the recording of diagnoses and procedures and abstracting, sequencing and coding. A new method of reporting of inpatient data was developed, whereby hospitals were able to submit their DRG-related information through a secure website. Data editing and product validation systems were upgraded in order to improve the quality of the data available for management purposes and to control risks of 'gaming' - such as the tendency to over code diagnoses and procedures (6).

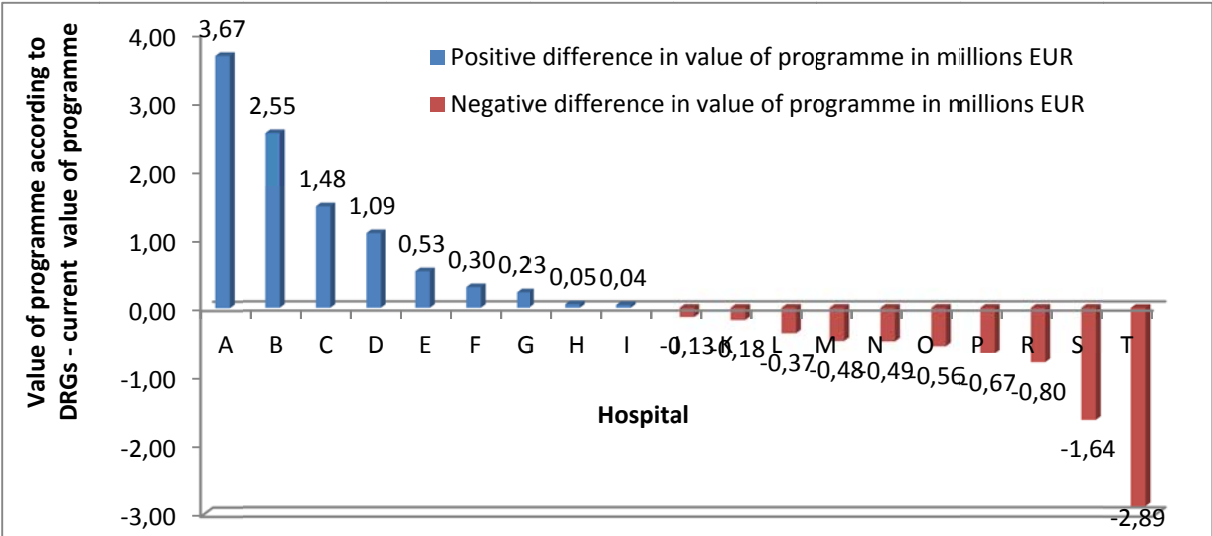
The new payment model for acute inpatient health care was introduced gradually. DRG data have been produced routinely since 2003. In 2003, those data were used in part for hospital payment (which continues to be prospectively capped through what is termed a 'budget share' method). In 2003 the payment model on the basis of DRGs served for allocating 10% of resources between the acute inpatient health care providers. A more detailed classification of DRGs (in 2003 the system contained 661 DRGs) and an unified price list for all the providers were developed. Compared to the previous much narrower classification of inpatient health care services and different prices for the same services performed by individual providers, a new model enabled more detailed comparison of the individual provider's performance and more transparent evaluation.

In 2003 we performed a costing study in three Slovenian pilot hospitals (University clinical center, the biggest and seventh biggest regional hospital) and in 95% of cases the severity of an average case was the same as in the Australian weights provided by the National Hospital Cost Data Collection Round 6 (2001-2002). A working group of representative of the Association of Public Providers of Health and HIIS was in charge to deliver the weights for the 5% cases with statistically significant difference through costing analyses. After a year the members of working group proposed to exclude payments for transplantation, dialysis, rehabilitation and psychiatric care and to take into account the elements according to original Australian standardized methodology for calculating cost weights.

The DRG-based payment model was introduced in full on April 1<sup>st</sup>, 2004. In the same year a separate budget was introduced for the payment of non-acute hospital care and tertiary services. For the non-acute hospital care which is paid on the basis of hospital care days the patients are normally admitted to non-acute or tertiary care after being discharged from acute care or when they need further care, rehabilitation, nursing or palliative care. Tertiary services paid on the basis of providers' reports on accomplished tasks include educational programs, trainings for special skills, field of research and development, and proficiency and severity of services provided. Since 2005 the classification of DRGs has contained 653 DRGs (excluded DRGs with regard to dialysis services and transplantation program which are reimbursed in accordance with different model). The cost weights used in the payment model are actually the Australian cost weights for public sector from National Hospital Cost Data Collection Round 6 (2001-2002) AR-DRG v4.2. (7).

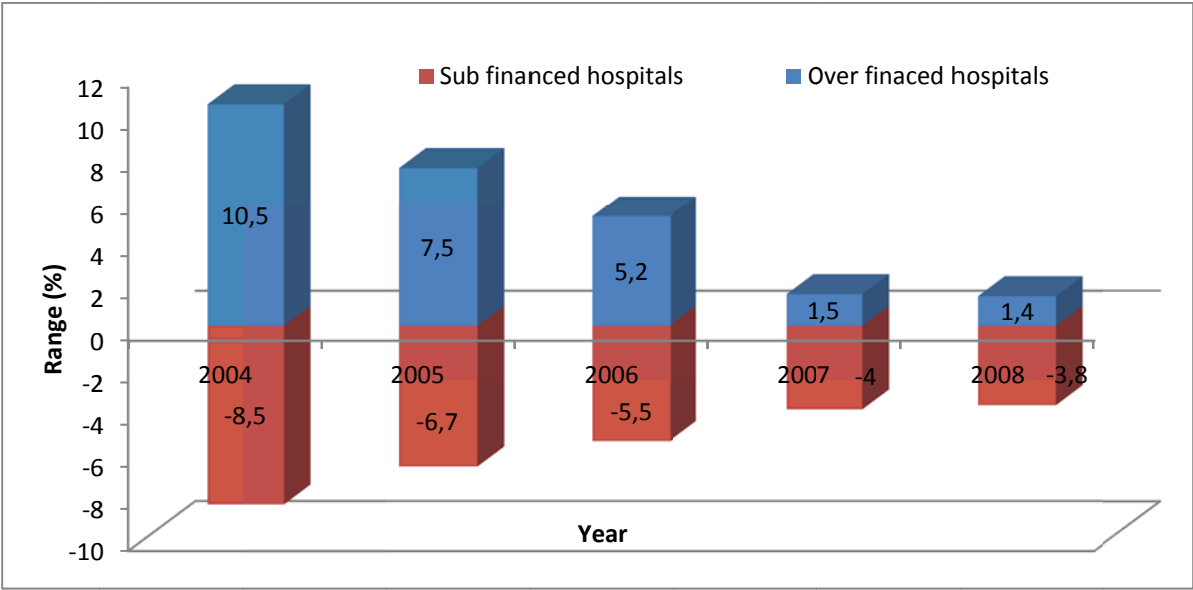
A feature of the transition process was setting the limits on the extent to which any hospital's total payments could decline from one year to the next. The reallocation of resources among the providers was limited with the maximum possible loss with regards to the current budget for the acute inpatient health care, since the differences between hospitals were large (Figure 2).

Figure 2: Differences in value of program DRG and old value.



In period 2003 till 2006 the maximum possible loss was 1%, while in 2007 it amounts to 2%. This is the main reason that the range fell slowly: in 2004 the range was 19% (-8,5% to 10,5%), in 2008 5,2% (-3,8 to 1,4%) and 0% in 2011 (Figure 3)

Figure 3: Range (%) of over financed and sub financed hospitals in the period 2003 till 2008.



Nowadays the model is also used for calculation of DRG budget for each provider according to provided services and benchmarking between current budget of each provider of inpatient acute care services and DRG budget which resulted in a re-allocation of resources among providers. The payment model for acute hospital care on the basis of DRGs represents the basis for transferring resources among hospitals on the basis of comparative historical budgets of acute hospital care and the value of acute care on the basis of DRG evaluation. The comparison between the two on the national level for year 2005 is minimal and can be ignored. This in turn had an influence on the providers in terms of management, benchmarking between departments within the hospitals, and between comparable hospitals. Aside from that the model also serves as a tool for comparative analysis for the needs of the management of the hospitals, payer and MoH to achieve greater cost efficiency on the side of the providers and quality of care. Hospitals or all public providers have specific cost-accounting process, unfortunately we still did not completely adopt the system to DRG. Some hospital use both processes to contain cost more effectively.

Till 2009 the price per DRG was calculated in the following way: price per average weighted case on national level multiplied by cost weight for particular DRG. Price per average weighted case on national level is total annual value of acute care on national level divided by total annual number of weighted cases. Since 2009 the methodology for calculating price per average weighted case has changed. In 2009 above mentioned price changed according

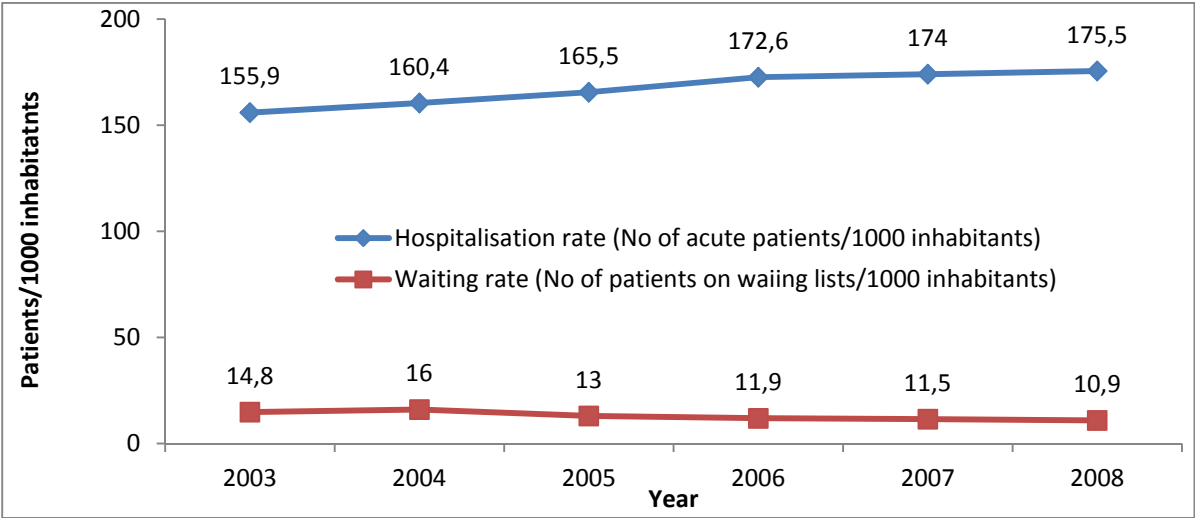
to changes in labor cost, material costs... HIIS does not pay hospitals for cases which are above the determined plan in a yearly contract. The same criteria are in use if a hospital exceeds the number of planned weighted cases. In the methodology for calculating hospitals' budgets according to DRGs, the prices of DRGs decreases if the hospitals produce more cases or weighted cases than planned.

Currently we are still working on Slovenian national cost analysis, which was still not performed yet. From 2010 upgrading of classifications is the responsibility of National Institute for National Institute for Public Health of the Republic of Slovenia (NIPH) and the MoH. HIIS took over the responsibility for upgrading DRGs as a financing system (yearly national cost analyses, upgrading of cost weights). One of the results will also be new cost weights according to Slovenian cost data. In the last period HIIS started with the hospital checks focused on over coding, analysis of special DRG groups retrospectively, however, the process is still not systematic. In 2013 a new classification ICD – 10 – AM/ACHI/ACS Sixth Edition, was introduced, but the coded cases by the new method are later on transformed in the old weights.

## **7. Results of the DRG payment model.**

In the period between 2003-2008 the hospitalization rate in acute care increased by 12,6% with a 1,66% average yearly growth), which was achieved with improved cost efficiency by further reducing the LoS and introducing appropriate organizational changes at the providers' level. Due to long-term positive financial consequences of the model of acute hospital on the basis of DRGs in 2005 the MoH proposal to increase the volume of acute inpatient care for 2% without additional financial resources was accepted at the partners' level. One of the important reasons for the rise is also the annual increase of certain procedures and operations, mostly those with long waiting times. The number of waiting patients dropped for 31% from 2003 till 2008 (Figure 4).

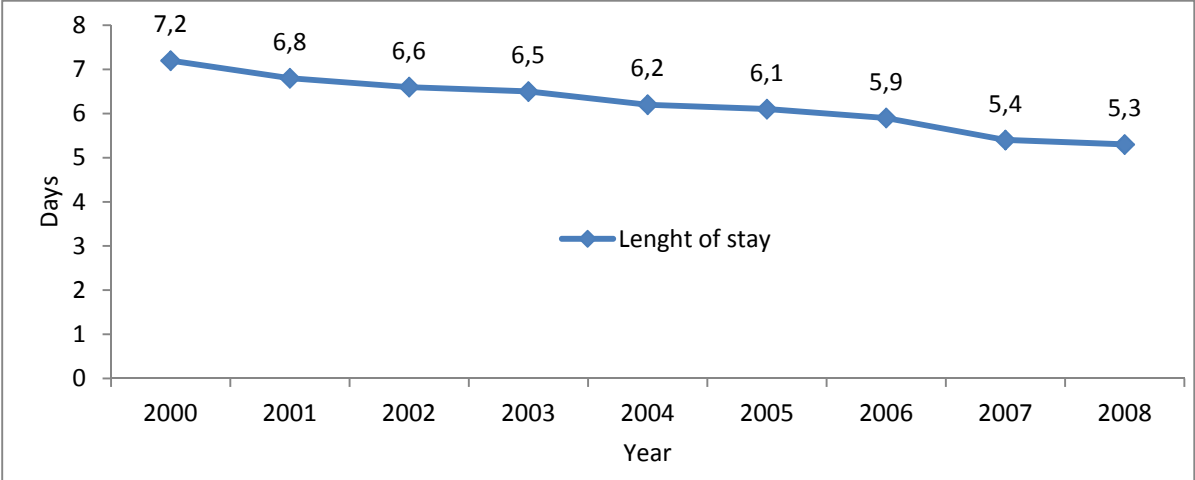
Figure 4: Average length of stay in acute care the period between 2000 and 2008 in days



Besides providing acute care the hospitals also provided 43.907 hospital care days within the framework of non-acute care in 2003. With the introduction of a separate payment model for non-acute care in year 2004, the number of providing hospital care days increased to 139.283 days in 2005, which roughly means 5000 patients.

In the period 2003-2008 the average LoS declined by 1.22 days or 18.5% (18,9 mio EUR) due to improved cost efficiency and implementation of non-acute inpatient care (Figure 5). It is interesting to note that the LoS declined to a greater extent in hospitals that had previously not been providing non-acute inpatient care than in those hospitals that had previously been doing so.

Figure 5: Average length of stay in acute care the period between 2000 and 2008 in days





The average number of diagnoses per case increased in year 2005 by 0.64 diagnoses or by 29,9% and 6,82 procedures compared with year 2003. The main reason was the introduction of the new procedure classification which has 10 times more codes, special training programs from the MoH for the hospital staff on data recording, abstracting, and coding. On the other hand there was also hospitals' recognition that the number of diagnoses could affect DRG classification: on the whole, more diagnoses are likely to increase the measure of case complexity and consequently the hospital's share of funding. These results in the CMI increase by 32,2% in the period between 2003-2005. The most important reason is the increase in severity of an average case which incurred in the change of used weights in year 2004 (in 2003 what was used for the calculation of the severity of an average case were the weights calculated on the basis of cost-effective studies in three pilot hospitals in Slovenia and Australian weights provided by the National Hospital Cost Data Collection Round 6 (2001-2002) with a correction for some DRGs with statistically significant difference between the cost-effective study and Australian weights)), active approach in ensuring better quality of recorded data, extension of program with above-average demanding treatments and partly excessive recording.

## **8. Discussion.**

The experiences of using the payment model for acute hospital care on the basis of DRGs in Slovenia confirm the positive influence of the model on increasing cost efficiency of providers. It contributed to a greater efficiency of providers in terms of setting up appropriate organizational processes and activities and to the treatment of a greater number of cases of acute patients. The increase in the number of acute cases shows higher cost effectiveness of providers. In order to increase the volume of the services of hospital acute care cases by 6,2% in 2005, only 4,2 % of additional financial resources were allocated, where the recorded average severity of a case increased by almost 33%.

Other countries have also experience a reduction in the LoS with the implementation of per case payment by DRG. The improvements in coding accuracy and completeness are as intended, and it is obvious that hospitals in Slovenia have made serious efforts to respond to the financial incentives. Further reduction in the LoS and separate budget for carrying out non-acute hospital care had a great influence on the delivered acute hospital care. All these was achieved through the implementation processes of the DRG payment model, which was introduced gradually. Within the framework of the HSMP in 2002 the 10-year strategy on financing the healthcare system was prepared. On the basis of the public debate an action plan was developed with clear goals and objectives, activities and tasks. The MoH took the lead of the coordinator, and in the frame of gradual implementation organized a number of workshops for all groups of users of the new financing model. The process of implementation was even more so intensive when all the partners met for annual negotiations between the partners and hospitals. The dynamics of introducing the new payment model was adapted according to the preparedness of the system (providers, payers) for the purposes of introducing changes (especially positive incentives as well as measures to prevent negative effects). In addition, since DRGs do not increase the quality of care (till 2010 164 clinical pathways were established) and with the implementation of the new payment model, the MoH introduced the usage of clinical guidelines and clinical pathways to ensure systems changes on all the levels and ensure quality of care.

## **9. Conclusion.**

The DRG payment model is administratively and operationally most demanding. The set up of model depends on access to data on clinical procedures and costs. The method ensures fairness and provides comparability of resource allocation between different service providers. Individual providers are thus stimulated to make best use of the costs by maintaining the average costs within the range of payment for the specific case groups. The model has to be supervised against misuse (excessive recording of higher weights, unjustified diagnoses and procedures) intended to raise the payment per case.

In Slovenia people with a mix of experience, clinical intelligence and interest were free to brainstorm and argue about new payment system in the participatory process. This was the main reason why the implementation of DRG data production was short, hospitals could apply the methodology for improvement and positive incentives were put in the system. Nevertheless we still have lack of capacity in the country, especially in costing analyses.

These are one of the main reasons that we still did not perform the national cost analysis. In 2013 the ICD – 10 – AM/ACHI/ACS Sixth Edition was introduced, but only a classification method, since coded cases are still projected in the previous defined weight groups used from 2003. HIIS performed some hospital checks focused on over coding, analysis of special DRG groups retrospectively; however, the process is still not systematic.

The main positive influence of DRG was increase in the number of acute patients treated and better access to health care services (31% decrease in number of patients waiting from 2003 till 2008), reduction in the average length of stay and higher efficiency of providers in terms of setting up appropriate organizational processes. However, it can be claimed that the introduction of DRG in Slovenia has increased the level of quality of reported data and information which had a positive influence on the whole health care system management. A period of seven years was needed to gain same price for the same procedure in all hospitals due to the negotiated limits of the maximum possible loss with regards on the extent of the reallocation of the budget for the acute inpatient health care among the providers.

Since DRGs do not increase the quality of care and with the implementation of the new payment model, the Ministry of Health introduced the usage of clinical guidelines and

clinical pathways to ensure systems changes on all the levels and ensure quality of care. Unfortunately we still did not combine DRG with clinical pathways in a clinical model as it was designed in the long term strategy of the provider payment reforms.

From 2008 on DRG has not been used as a main tool for the management of in-patient services. Systematic supervision of weighing lists, national tender for a limited number of surgical services and increase of the number of prospective programs has been used as a main tool for more active purchasing (8).

More needs to be done in many areas, including ongoing education in the production of clinical data, the use of DRG data for management, and improving efficiency and quality of care in response to the changes in payment methods. However, the results are encouraging overall, and clearly indicate that – if hospital managers and clinicians are given sensible financial incentives – they will respond in a rapid and intelligent way. Further development is placed in the hands of the Council for DRGs and its committees; where the MoH established the Council for DRGs where different representatives from the MoH, providers, payers and the NIPH have been appointed as coordinators. Its main tasks is to ensure the sustainability of the system, which needs to follow the national goals of the healthcare system and ensure the appropriateness and uniformity of the development of the DRG system; whereas the tasks of the committees are to carry out several activities: measure efficiency, cost analysis (upgrade the system of financing), supervise and ensure quality of care, DRG development and appropriate classifications. There is a lack of data quality control and supervision. In our process we picked the right way from “bottom – up”, we built trust and partnership. All systems problems have been solved systematically by learning and adjusting as we followed the action plan of our strategy. Nevertheless we still have not built enough capacities and involve enough partners, especially representatives of the HHS.

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