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Overview of Estonian experiences
with DRG system

Department of Health Economics
Estonian Health Insurance Fund

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Note: Current publication bases on overview paper prepared for Lithuanian Health Insurance Fund in 2007 to implement payment system reform in Lithuania and share experiences from Estonia.

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1. The rationale for implementing the DRG system in Estonia

In 2001, the Estonian Health Insurance Fund (EHIF) decided to introduce a Diagnosis Related Groups (DRG) based payment system. A central argument for the introduction of a DRG system in most Western countries is that it provides for the opportunity to increase the transparency of hospital output. A diagnosis-based classification of hospital output is fundamental for the comparisons of outcome-related expenses, medical practice and quality of care among hospitals. Furthermore, the transparency of hospital performance is a key pre-requisite for inducing competition among hospitals. However, due to the former fees-for-services and well-developed electronic data transmission systems, Estonia had already a relatively transparent overview of the output of hospitals. Hospitals transfer detailed data to the EHIF.¹ On the basis of the EHIF price list of procedures, it was already possible, without DRGs, to summarise the procedure costs per patient hospital case.

Financial constraints for Estonian hospital care are tight, and the EHIF is unable to spend more than its budget (including reserves), since it is not able to increase health insurance contributions. The results of the tight expense barrier were very serious after the effects of the Russian economic crisis on the Estonian economy in 1999, when the reserves of the insurance funds were exhausted: the rationing of hospital services had increased by the end of the year. Therefore, for the EHIF, it seems essential to mobilise DRG-based productivity gains in order to optimally utilise budget allocations and to contribute to less rationing. Another impetus for introducing a case-based payment system was that up until that time the fee-for-service (FFS) and per diem system was mainly used. The FFS system led to a rise in the average cost per case, which increased more than 30% between January 2000 and September 2002 (the official price increase was only 13% during that period).

The movement to introduce case-based payment and to move further from the FFS system began in the 1990s. So-called “complex prices” were introduced in Estonia for several well-defined surgical diagnoses such as appendectomy, hip and knee replacements and normal childbirths in 1998. This was a country specific system. In 2004, there were about 50 “complex prices”, although the share of these in terms of the total inpatient budget was small compared to per diem payments and individual fee-for-service payment.

The DRG implementation plan was prepared in 2001 and the first optimistic proposal was to begin the DRG based reimbursement of hospitals in 2002. However, during the preparatory process, it became clear that the plan was unrealistic and that more time was needed for technical preparations. In addition, in order to neutralise the risk of technical problems and strong opposition from partners, it was agreed that the DRG system would not be implemented fully but rather would be implemented step-by-step. In addition, it was said that the payment system would be partial, in that the previous mechanisms would work in tandem to assess the impact to the provision and doctor’s behaviour. It was discussed whether only to implement the DRG system for some

¹ The governmental bodies in Estonia and later the EHIF had nearly unrestricted access to all data concerning hospital care as well as general practitioner (GP) care and the reimbursement of drugs, all identifiable to a single person (patient, physician and other service provider involved). These data opened up enormous opportunities for health care analysis.

specialities (e.g. ophthalmology), which are most homogenous and where the financial risk is smaller, perhaps providing for the calculation of weights and prices for a select number of DRGs only. However, there are drawbacks to this kind of implementation as DRGs are not directly related to medical specialities and therefore one speciality can have DRGs throughout the DRG system. Therefore, this alternative was not seen as a very practical one.

2. Selection of the appropriate DRG system for Estonia

2.1. Alternative DRG systems and local factors considered

Before the DRG system implementation in Estonia, several DRG systems were compared to find the best option for Estonia. The alternatives under consideration were Australian AR-DRG (Australian Refined Diagnosis Related Groups), Nordic NordDRG and Estonia's own case-based system. Due to the very tight timeframe, a rather pragmatic approach was used and there was no in-depth analysis. However, the pros and cons of different DRG systems were compared. Various criteria were used to evaluate the available systems in line with other clinical classifications in use including, clinical practice, clinical cases, cost of implementation, and technical support. The following provides a sample of the alternatives with background information:

- **Classifications used for diagnosis and surgical procedures.** Firstly, following on from ICD-9, Estonia had implemented ICD-10 as a classification for diseases since 1997. Therefore, the first criterion was to analyse DRG systems using ICD-10 and not older versions. In addition to diagnostic codes, the DRG system uses other classification for surgical and sometimes other procedures. This was the “missing” independent classification, as in Estonia, the only classification for surgical procedures was the so called “fee-for-service price list”, which included about 700 different surgical procedures. Therefore, it was evident that there was a need to introduce a new classification for surgical procedures that can be used as an input to DRG grouping logic. The introduction of any classification is a complicated process, which causes the concern of having additional “paper work” among doctors; for that reason, the objective was to change the existing system as little as possible. However, it must be said that some of the doctors and providers supported the idea to also have a classification for statistics that is not solely used for billing and payment purposes. When comparing the different DRG systems, it was obvious that various practices existed. The AR-DRG system was modified to meet ICD-10 and Australian Classification of Health Interventions (ACHI). The All Patient Refined DRG (APR-DRG) system is based on ICD-10-CM, and, in addition, it takes into account the severity of illness and risk of mortality (on a 4-point scale). The NordDRG system uses the ICD-10 and NOMESCO² Classification of Surgical Procedures (NCSP). Taking into account that ICD-10 had already been introduced and was being used by doctors and others (but not the ICD-10-CM that is used for procedure coding), the acceptability of NordDRG was the highest. In addition, the positive effect was that even NCSP was not an official classification in Estonia. It had been translated into Estonian, and there were

² NOMESCO – Nordic Medico-Statistical Committee

ongoing discussions on whether to implement it to provide more systematic medical statistics on surgical activity in the country.

- **Number of cases.** Secondly, the NordDRG system Common version consists of about 500 DRGs. Upon analysing the clinical activity, it did not seem to be recommendable for a small country like Estonia with quite a restricted number of cases (279,470 cases in 2000) to have a larger number of DRGs, as is the case with the Australian system. In addition, the development of an “own” DRG system was considered. However, first analysis showed that for such an exercise, data needed to be collective to have reliable results, even when the number of groups was limited to more than 5 years. In Estonia, due to a lack of cases, it seemed to be difficult to form homogenous DRGs, by taking into account the severity level that was used in some of the systems. Bearing in mind the number of cases, using the simple and reliable system already developed was considered, whilst collecting data for further analyses to individualise the DRG system to country-specific needs in the future.
- **Comparison of clinical practice and hospital production.** The third advantage of the NordDRG system is that it enables the EHIF to compare Estonian hospital production with Nordic countries and to detect variations in clinical practice. The fact is important for international comparisons, statistics and economic analysis. In addition, this provides the possibility to compare clinical practice and provide feedback to professionals. This would be impossible if Estonia’s own case-based system were developed.
- **Cost of the system.** Fourthly, the owners of the NordDRG logic have no commercial interest, so the implementation of the DRG system is not expensive due to lack of annual fees or other similar arrangements. However, Estonia was expected to contribute to the development of the NordDRG system further and fund the Nordic Centre for Classifications in Health Care³ annually. A similar system is also implemented for basic classifications such as ICD, NCSP, etc., where the Nordic Centre acts as a collaborating centre for WHO.
- **Technical solutions.** In addition to the classifications and comparisons, technical solutions were considered, as the DRG system needs efficient data collection and a coding system to group treatment cases using basic classifications. From the mid 1990s, the development of an electronic solution for the EHIF database was begun. By the end of the last century, most local insurance funds had electronic databases using various data delivery systems (diskettes, zip-drives, CDs, or electronic channels). In 2000, the whole of Estonia was covered with one database (connected databases), with data being imparted through electronic channels. On the basis of the latest electronic database improvements, it was possible to develop a system where there was a central NordDRG grouper that all the hospitals were able to use for the grouping process. It was considered an important step, as, otherwise, each provider would need to purchase an individual grouper, data checking would be more time consuming, and implementation would require more time.

³ Since January 2009, the centre was renamed Nordic Casemix Centre

- **Availability of technical support.** Sixthly, the Nordic countries are close to Estonia, which makes seeking advice very convenient. And more importantly, it cannot be denied that positive collaboration experiences with the Nordic countries have influenced the decision. It builds on the long collaboration on mortality and morbidity statistics between the Centre and all the Baltic countries (e.g., Latvia gained support to implement the NordDRG in late nineties, but has not finalised the project) and good contacts between professionals. From its very inception to the move towards the DRG system, there has been support from the Nordic Centre for Classification in Health Care (maintaining the NordDRG systems) to analyse the applicability of the NordDRG system for Estonia.

2.2. Testing the feasibility of NordDRG system using country-specific data

The initial plan was to implement NordDRG system in Estonia in 2002 after testing the NordDRG groupers feasibility for Estonian data. Since the NordDRG logic is based on the NCSP, the Estonian surgical procedural codes had to be mapped with NCSP codes. This was done as the NCSP was not yet utilised as official classification. As part of the FFS-payment system used then, the EHIF is only using surgical procedure codes for billing purposes. Compared to NCSP, there were a relatively small number of surgical procedures in EHIF's price list (700 versus 8,000 in NCSP). Estonian physicians from different specialities performed the mapping of Estonian surgical procedure codes and NCSPs. This was possible as the NCSP was already considered one of the strong candidates for procedure classification (even though there were also other classifications analysed for this area since the late 1990s). Therefore, many leading surgeons were already familiar with the classification, as they had worked with the previous NCSP translation to Estonian. The aim of the mapping was to find for each Estonian surgical code at least one appropriate match from the NCSP codes.

As a result, EHIF got the mapping table for the NordDRG grouper, which was not an ideal tool but it facilitated grouping Estonian billing data from the year 2000, according to NordDRG rules. In addition, there was also the plan to use that mapping table, if the NCSP would not be introduced into Estonia. The latter did not take place, as NCSP was introduced one year prior to NordDRG with the aims of having more reliable countrywide medical statistics on surgical activity and support for the DRG system.

Based on these mapping tables, the complete hospital care data of the year 2000 was being grouped and made available for DRG analysis. In total, there were almost 300,000 cases that were grouped according to DRG rules. As a result, 32 DRGs were left without any cases (in total, there were 498 DRG groups) and about 1.5% of total cases remained ungrouped. There were two reasons as to why some DRGs remained without any cases. Firstly, some procedures are not carried out in Estonia (e.g., heart transplants). Secondly, Estonian surgical procedure codes are not as detailed as NCSP codes, and for one Estonian surgical procedure there might be many matches from NCSP. However, such results using mapping and already available data were considered to be effective for further implementing the NordDRG.

3. NordDRG implementation in Estonia

In 2002, when the preparatory work was carried out, the full implementation of the DRG system as a payment mechanism was seen to be too risky, as it was not clear what the actual financial risk classification for providers and EHIF would be. Therefore, it was decided by EHIF that in 2003 DRG system would be used as a grouping tool only as a middle step before full implementation. This was especially important as the NCSP was introduced in Estonia in early 2003 as procedure classification, and more time was needed (especially among doctors and specialists) to adapt to the new classification system. After one year after monitoring NCSP usage, it was clear that the only way to have a real impact on the quality of classifying the cases was to start reimbursing according to DRGs – the reason being that when only using DRGs as a classification, the interest to understand the system is low, and there are no strong incentives to improve the use of classifications as ICD-10 and NCSP. After consultations with Nordic countries and their experience, a similar effect was found. To give stronger incentives, it was agreed that the next step should be the gradual introduction of DRG as a payment system where only a proportion of each case treated will be reimbursed by the DRG price, which was endorsed and implemented from 2004.

3.1. Introduction of the Nordic Classification of surgical procedures

When the decision to move to the NordDRG system was made, it was also decided that NCSP should become official classification in Estonia because, otherwise, the quality of DRG grouping would suffer. As described earlier, EHIF managed the risk of non-implementation with the mapping tables. However, those were used for analysis and were not necessary in the later stage. NCSP was already translated to Estonian several years ago, and, in 2002, it was also published in paperback as well as electronically.

After long discussions between the Ministry of Social Affairs (MoSA) and EHIF, from the beginning of 2003 the NCSP (version 1.6) was brought into use as the official classification in Estonia. In addition to the negotiations between the administrative units, the involvement of the surgeons was important. During the first four months of 2003, it was optional for providers to use NCSP on medical bills they were transferring to the EHIF. After four months, from the beginning of May, the bills without an NCSP code were not accepted (if there was a bill for a surgical operation, NCSP was required). This requirement improved usage of NCSP codes and the coding quality significantly (see table 1), and the interest of providers to understand the logic of NCSP increased.

Table 1. Results of NCSP implementation

Month	Bills with operation	Bills with missing NCSP	% of bills with missing NCSP
01.2003	6 406	4 098	64%
02.2003	6 789	3 991	59%
03.2003	7 477	4 157	56%
04.2003	8 700	2 246	26%
05.2003	9 097	785	9%
06.2003	7 912	326	4%

One important precondition of NCSP implementation was the training of doctors and administrators. In December 2002, EHIF organised a one-day training session for interested parties. NCSP as a classification is a relatively simple one, and, therefore, the one-day training was seen as sufficient. A similar one-day training had also been conducted in other countries where NCSP is implemented. In Estonia, where there were no prominent experts on NCSP, the external trainer from Nordic Centre was used. The training was in English but materials were provided in Estonian. One of the additional aims was to attract a number of persons to the training who would act further as local trainers in Estonia.

As a follow-up to previous training in October 2003, MoSA organised NCSP training (organised in different regions as one-day training) for hospitals with the aim of discussing the NCSP logic and sharing the main obstacles based on first year experiences. It was evident from the available data that the competence level on coding is quite diverse in different Estonian regions. Compared to the training in 2002, when NCSP had not yet been introduced, the interest of participants was much higher, participants were really searching for the answers to their questions, and they were ready to discuss major errors.

Currently, the NCSP in Estonia is the generic classification version 1.6, and it has not been updated yet. The updated version of NCSP will be introduced from January 2010.

In practice, the NCSP has generic and country-specific versions that can be updated on an annual basis to introduce/change coding. However, this has to be well justified at country level and then discussed with the Nordic Centre for Classifications in Health Care.

3.2.IT-solutions for DRG grouping and implementation of DRG as payment system

In the early stage of implementing the DRG system, a quick analysis was made of what kind of changes has to be done among EHIF's and providers' IT systems. It was especially difficult, as at the same time the whole IT system of accounting for EHIF was going through reform, and the preliminary analysis was done taking the logic of an old system as a basis. In table 2, the overview of main systems influenced by DRG implementation is provided.

Table 2. DRG-s and IT systems

System	Main function
1. Providers' IT system for medical history	First level where the information (patient's sex, age, diagnosis, etc.) comes for DRG grouping
2. DRG Grouper	Software that transforms the patient's information to the DRG groups.
3. Provider's accounting system	Transforms the needed information (incl. DRG) to the medical bill format that will be transmitted to the EHIF
4. EHIF's IT system	Check-up of transmitted medical bills, reimbursement.
5. Analysis and planning tool	Visual DRG facilitates following the DRG grouping logic at the individual case level

As one of the providers' counterarguments was that the introduction of DRGs requires extensive changes in IT systems, the objective of EHIF was to find out the simplest solution for providers. Therefore, it was decided that there had to be a central grouper and that the grouping process should not be a time-consuming or technically complicated process. In addition, to avoid providers' opposition, only minimal changes were planned due to DRGs in providers' IT systems.

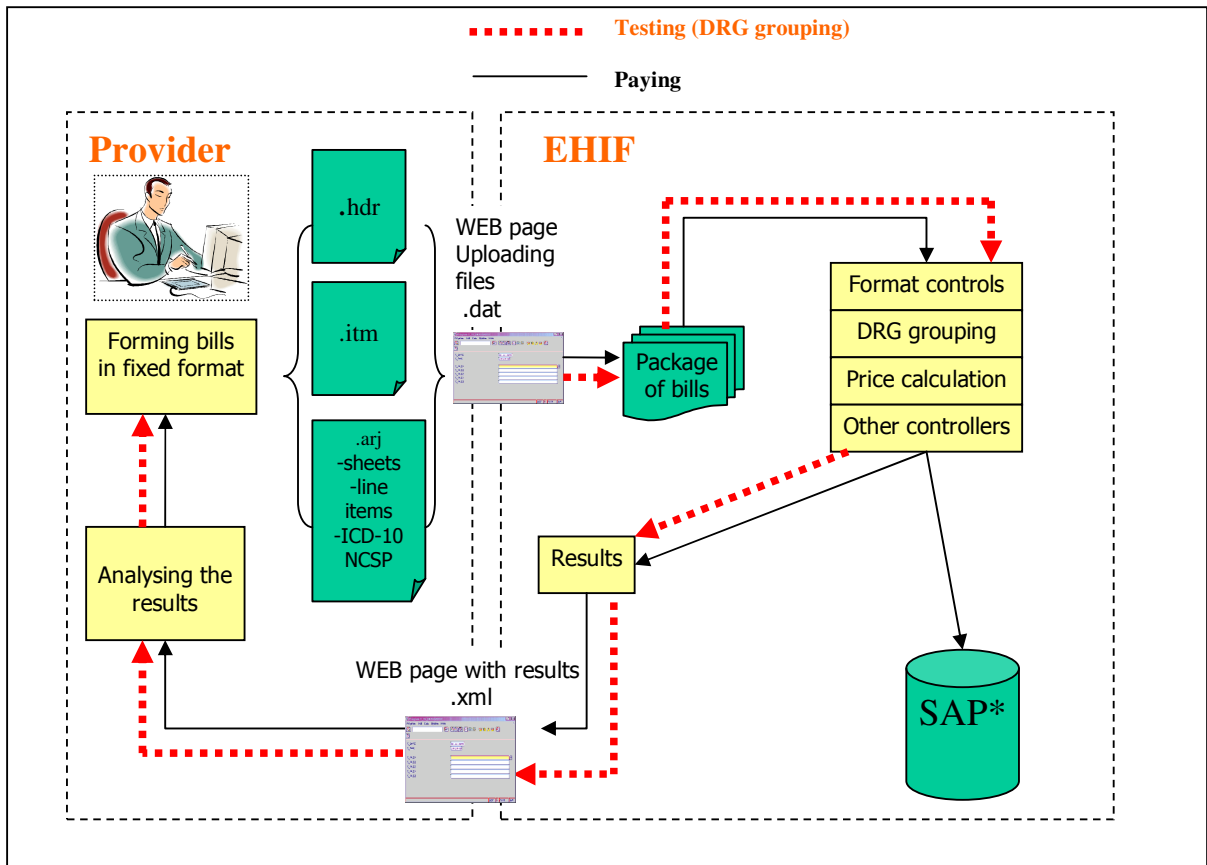
NordDRG groupers are only provided by a limited number of companies, which have to pass quality control by the Nordic Centre. In the beginning, when it was not clear where the DRG groupers would locate, the option that some Estonian company would provide DRG groupers was considered. Afterwards, when it became evident that most probably Estonia would only have one central grouper for all providers, this idea was sidelined. However, it has always been possible that producers from any country could provide software after quality control and negotiations with the Nordic Centre, providing input as grouping logic to the IT solution providers.

As mentioned above, the EHIF's electronic data transmission system went through radical changes (the objective was to move to a full electronic billing system and to finish paper billing). On the one hand, this made DRG implementation easier, as changes due to DRGs were only marginal. On the other hand, during the planning phase, the end result of the IT solutions was unclear and this made communication with providers complicated.

The final solution that was agreed, which is working to date, was that providers complete their medical bills for EHIF as they used to do it by filling the patient's and provider's characteristics and performed services according to the FFS service list (see figure 1). Filled bills are gathered together in "electronic packages" and transmitted to EHIF. Medical bills with certain characteristics (in-patient and out-patient surgical cases) go to DRG grouping in EHIF's central server.

In EHIF's central server, there are several stages to DRG grouping. In the first stage, there are performed format controls and bills with mistakes are remitted. In the second stage, DRG grouping continues if certain conditions are fulfilled. Following this stage, taking into account DRG price information, the total amount of the medical bill is calculated. In the final stage, medical bills are controlled against electronic content controls. Those bills that have no problems are passed to the provider for final acceptance before payment.

Currently, Estonia is using the DRG grouping logic from the year 2003 (http://www.norddrg.net/norddrgmanual/NordDRG_2003_NC/index.htm); as in the meantime, there have been no modifications in primary classifications in Estonia. As with the NCSP system, countries can develop further versions of classifications and propose modifications to the Nordic Centre. There are clear rules on the updating classifications as well the grouping logic. However, before updating logic, the local capacities need to be developed at country level and panels convened to have discussions between administrators and medical doctors. All the local activities can then feed into the international collaboration where regular meetings are held. It must be said that, until now, this part has been less developed due to various reasons mentioned earlier.



*SAP – defines business software as comprising enterprise resource planning and related applications

Figure 1. Electronic data transmission and DRG grouping

3.3. DRG pricing methodology

DRG pricing methodology was most critical discussion topic during DRG implementation. One principle followed by EHIF was that DRG prices had to be equal for all providers and there would be no higher rates for teaching hospitals or for other higher level or specialised hospitals. The argument used was that there was no good reason why an ordinary appendectomy or tonsillectomy should be more expensive in higher-level hospitals, but higher-level hospitals are used to catering for more complicated cases and this was already taken into account by DRG grouping logic. Nevertheless, different DRG rates (equal weights but different base rates) were seriously considered to increase the regional and central hospitals' motivation to move to the DRG system. The final decision on that question was left to the Hospital's Association where smaller hospitals have the majority and therefore the "equal prices" approach was decided. However, it must be mentioned that the equal approach towards providers has been one of the basic principles followed through the years.

For DRG cost-weights calculation, two alternatives were considered. Firstly, Estonia would calculate its own DRG cost-weights according to the historical FFS-based billing information available. The second alternative was to take over HCFA (*Health Care Financing Administration*) cost-weights, and the DRG prices would be calculated based on the average cost of case. It was evident that hospitals were not able to provide DRG-based cost information to use this as an input for DRG weights calculation.

Both versions, HCFA-based and Estonian own cost-weights, were analysed and presented to the providers (the impact of different versions on the hospitals' budgets was simulated). The fact that Finland tends to use HCFA cost-weights at the very beginning without problems encouraged the EHIF to choose this course. The plan was that beginning with the HCFA cost-weights system would provide a good basis, as they are based on superior quality data analysis. Besides, the cost-weights proportions tend to be analogous in different countries.

However, the Estonian own cost-weights idea was supported more among providers (even there was very strong opposition to the DRG implementation), as these were seen to reflect the reality better. Therefore, the decision was made to use some "home-made" mix of Estonia's own data and HCFA cost-weights.

As a result, DRG weights and prices were calculated based on data from the period 01/2003-06/2003. The advantage of using this period data was that it enabled DRG grouping basing on NSCP codes, which were added to medical bills since January 2003.

DRG prices were calculated based on acute inpatient care and surgical outpatient care medical billing information available from EHIF. A problem with such an approach was that it drew on administrative prices but not on actual cost. It was assumed that, to a certain extent, doctors were implicitly trying to use different combinations of FFS based fees to cover actual costs. Therefore, the average costs per case based on this information gave relatively good approximation for actual costs per case, until there was no other alternative available. It was planned that the actual costs would be updated later if the costing model were developed for the FFS list.

The average price per DRG was calculated using two phases trimming (in the 1st phase, outlier cases with cost outside 3 standard deviation (STD) were excluded, and in the 2nd phase, outlier cases with costs outside 2 STD were excluded) to eliminate the impact of outliers (see figure 5). The same methodology is also currently used as no better alternative has been found.

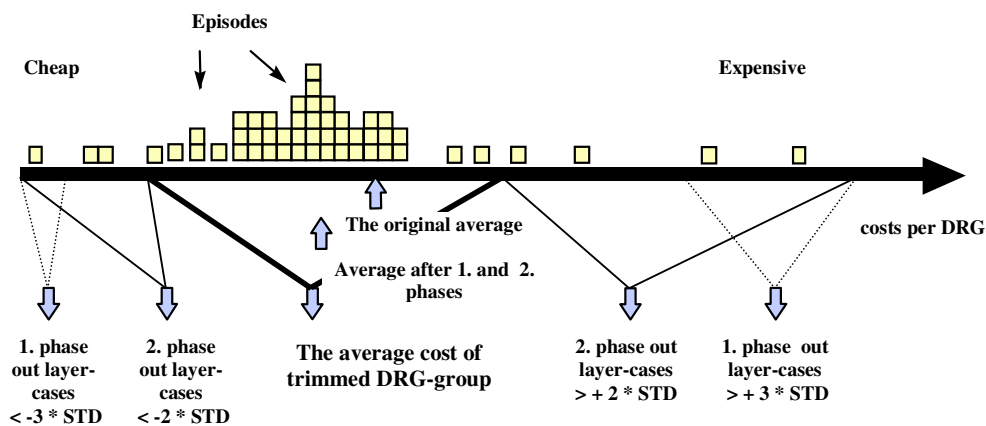


Figure 2. DRG outlier calculation methodology

For the DRG groups where there was less than 30 cases available in the dataset used, the DRG cost-weights proportions were taken from the HCFA DRG system from the year 2000, and based on that, the DRG price was estimated (HCFA cost-weight was multiplied by 1.5 to bring the weights to the Estonian level). This approach enabled for calculating DRG prices for all DRG groups, even for those where there were no cases available at all. Therefore, in the end, the method facilitated having as much input as possible from Estonian system and including missing data from other sources. In addition, a comparison with the HCFA system was done internally in EHIF to conduct a quality check.

In 2006, EHIF began to develop Estonian own DRG cost-weights with the purpose of fixing mutual proportions of the DRGs and achieving more stable prices that would substantively reflect the actual amount of resources used. In addition, it facilitates the development of DRG system as an analysing tool. During the DRG cost-weight designing process, some professional specialists were involved in the process. As a result of the project implementation, Estonia's own DRG cost-weights have been used since 2008.

Implementation of the cost-weights was supplemented by making corrections in the pricing methodology.

3.4.Reimbursement rules and outliers system

In 2002, it was decided that DRG as a grouping tool would be implemented in 2003 and as a payment system in 2004. A one-year testing period was agreed as the NCSPs were introduced in 2003, and it was not clear as to how this would influence the DRG grouping and how big the financial risk was. To make the implementation smooth in an administrative sense, DRG as a payment system was put into practice from 1st April 2004 (as the contractual year between EHIF and providers begins in April and lasts one year).

During the process, there was also one option to pilot the DRG system in some hospitals. Due to the strict regulative framework, the piloting was impossible (all providers should have equal payment rules in Estonia). On the other hand, beginning with piloting in some hospitals could lead to the situation where it was too difficult to move from the piloting stage to full implementation. And, even more importantly, due to the small number of cases in the country annually, the piloting would not give enough input to develop the country-specific system further.

As mentioned already earlier, in order to reduce the financial risks, the DRG as a payment system was implemented partially. It was decided that during the first year the DRG payment share should be 10%, which was small enough to minimise the risks but was sufficient to raise the interest of providers. Partial DRG reimbursement means that the total sum of the medical bill was calculated in a way that the FFS-based total sum of the bill was multiplied by 0.9 and the corresponding DRG price was multiplied by 0.1. In 2005, the share of DRG-based payment was increased from 10% to 50% (see example in figure 3), and from July 2009 it was increased from 50% to 70%.

DRG outliers system (rules to detect cases that will not go under the DRG-based reimbursement) can be divided into two parts. Firstly, cases with certain characteristics are treated as DRG outliers and are reimbursed 100% according to FFS.

Secondly, cases that have too low or too high a cost (cost outliers) are reimbursed 100% according to FFS.

Patient's primary diagnosis: O46.8 (<i>Other hemorrhagia in antepartum</i>)	
NCSP: -	
DRG: 384 (<i>Other antepartum diagnosis w/o medical complication</i>)	
FFS based services:	
Per diem (1 day)	EEK 927
Sonographic procedure (x2)	EEK 408
Cardiotocographic procedure	EEK 198
CRP in quantitative method	EEK 150
Sum of FFS based bill:	EEK 1 683
Price of the corresponding DRG	EEK 1 892
TOTAL SUM = 0.3 * 1 683 + 0.7 * 1 892=	<u>EEK 1 829</u>

Figure 3. Theoretical example of the calculation of the total sum of the medical bill
 All inpatient care cases and outpatient care cases with surgical procedure fall under DRG grouping. However, some type of care such as psychiatrics, rehabilitation, tuberculosis and nursing care are not reimbursed based on DRG-s. There are also main diagnosis-related exemptions and if the main diagnosis is *Z76.3 (Healthy person accompanying sick person)*, *Z51.1 (Chemotherapy session for neoplasm)* or *Z51.2 (Other chemotherapy)*. The latter two were included in the exemptions in summer 2007, which was caused by the different price level of chemotherapy courses and this caused an unequal situation. These areas were proposed, as psychiatric care is a special case, and likewise with long term care. At the same time, there are special DGR systems under development internationally to cover these areas.
 In addition, follow-up cases are not reimbursed based on DRG. Since spring 2007, there is one additional rule that for remitted cases the higher-level hospitals (regional and central) are reimbursed according to DRG and lower level hospitals get 100% FFS payment. This exemption has been added as usually lower level hospitals tend to remit complicated cases to the higher level, and, therefore, they get overpaid when reimbursed by DRGs.

Other type of DRG outliers are set according to the FFS based cost of the case. The upper and lower limits are identified according to the last trimming points (see figure 2, the limits of 2 phase trimming). In many cases, the lower limit is a negative value, and, therefore, the lower limit is set equal to the lowest per diem rate in force.

3.5.The role of stakeholders during the DRG implementation

The main interested party of DRG implementation was very clearly EHIF. Other parties including the Ministry of Social Affairs, medical specialities, and providers were relatively inactive during the preparatory period and were not in strong favour of the idea.

The Ministry of Social Affairs has a rather small role on everyday reimbursement policy and operational issues, which explains their passive role. At the same time, the

Ministry has the role of supporting the strategic direction and agreeing at a macro level. In regard to the latter, there was quiet support for DRG implementation. On the operational side, the Ministry was related to the NCSP introduction as being the responsible body for maintaining primary classifications as NCSP but also ICD-10. The Ministry's role increased during the final decision making process (whether DRG would be implemented or not) when the providers' opposition increased tremendously. The then minister (also as the head of the EHIF Supervisory Board) had the mediator's role between EHIF and providers.

Medical specialties were actively involved during preparatory period. During the process, EHIF involved various specialists to support the process. Their role was to translate DRG terminology (DRG names), to do the mapping between NCSP and operation codes, and to assess the feasibility of DRG logic in terms of clinical practice. The latter had no real impact on DRG logic in practice and mostly had an educational impact. However, the interest of the medical community was low with some exemptions. The main fear doctors was that as a result of DRGs they would have to spend more time on coding and have less time for clinical work. At the same time, the message and reality was that actually the DRG system does not change the work and coding used by doctors, and the only changes were related to administrative procedures inside providers and between providers and the purchaser.

The interest among hospitals at the very beginning was low, but after introducing the preliminary price calculations their interest started to increase. EHIF made a communication error and they introduced preliminary DRG prices for the average costs of cases (no trimming for outliers were used). Therefore, the DRG prices were very unfavourable for regional and central hospitals. Following this, regional hospitals became the biggest opponents to the DRG system, as they saw the potential threat of losing revenues. However, this has also had a positive impact in raising awareness about DRG system among hospitals. The final negotiations were held with the Hospital Association that is also representing all hospitals in the contract negotiations. Therefore, at the same time, the Hospital Association in general, which has the majority of members from lower level hospitals, was not clearly opposing the DRG system, and, therefore, the regional hospitals' voice did not influence the final decision.

4. Lessons learned from the DRG implementation process in Estonia

In the following section, a few lessons learned are highlighted. At the same time, it is important to note that the theoretical model of DRG system is as important as the process. The list of lessons learned might not represent the full list, and it must be also said that it is very important to consult with the countries that use a similar NordDRG system, as all Nordic countries apply it differently. Currently Estonia, Norway and Sweden (to a certain extent) use the system for reimbursement. At the same time, it also serves as a classification system (as in first phase in Estonia) in part of Sweden and, in addition, as an accounting system in Finland. Therefore, the lessons and practice is country-specific and changes in time.

1. *DRGs are not for punishing providers but try to find win-win solutions.*

The DRG system is multifunctional and, therefore, there could be many reasons for implementing it. In Estonia, the main objective was to contain the increase of the average cost of case. A mistake that was made at the beginning was that it was communicated that the objective was to reduce (!) the cost of cases. In conditions of high inflation and rising expectations, it's not very realistic, and definitely this was one reason why providers were opposed to DRG implementation. Afterwards, EHIF modified the message but it no longer changed the providers' position.

2. *If you are sure that DRGs are important for your system, don't be stuck on methodological and classification problems*

At the very beginning, EHIF was very optimistic on the time plan for DRG implementation. Afterwards, the time plans were adapted to become more realistic. In total, there was one and half years of preparatory time before DRGs were implemented as a grouping tool and almost three years before they were implemented as a payment tool. During that period, there was not very much time to go in depth with methodological problems, and it relied mostly on the fact that in Nordic countries the system worked and should work, therefore, also work in Estonia. Before the final decision was made, providers tried to draw attention to several methodological and classification-related problems and to postpone DRG implementation. It was evident that when postponing DRGs implementation date once, it would be postponed again in the future. Therefore, EHIF decreased the financial risk of implementation by reducing the share of DRG payment, by arguing that if there was no money related to DRGs, providers would not be interested in enhancing the system.

3. *Involve partners and provide training, but don't be disappointed if there is no interest*

Doctors and other representatives from hospitals (e.g. statisticians, coding practitioners) were involved at several stages in the process. On the one hand, doctors were used as experts to provide input into DRG implementation. This guaranteed that at least some representatives from each speciality became familiar with NordDRG principles and grouping logic. On the other hand, there were several training seminars and information days were organised. The interest was low in the early phase, but the interest increased when it became evident that DRGs are actually related to resources. The trainings were also important in order to get a better picture of providers' worries and to respond to these worries with adequate measures.

4. *Docs don't like coding*

As mentioned above, the main reason for opposition among doctors was the fear that DRGs may cause additional coding-related responsibilities. The reluctance of doctors was increased due to the NCSP introduction, which seemed to be a very comprehensive and complicated classification system. Therefore, it was important to separate NCSP implementation from the DRG project and to highlight the importance of NCSP in other terms (e.g. good for medical statistics and allows specialities to measure their professional practice). Afterwards, doctors argued that NCSP as a classification was not a complicated one and not being used for additional coding. Thanks to this, DRG implementation did not add any additional coding for doctors, as all the necessary information was already available on medical bills.

